

Assessment of compliance with the Code of Practice for Official Statistics

Population Estimates and Projections for Scotland

(produced by the National Records of Scotland)

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About the UK Statistics Authority

The UK Statistics Authority is an independent body operating at arm's length from government as a non-ministerial department, directly accountable to Parliament. It was established on 1 April 2008 by the *Statistics and Registration Service Act 2007*.

The Authority's overall objective is to promote and safeguard the production and publication of official statistics that serve the public good. It is also required to promote and safeguard the quality and comprehensiveness of official statistics, and good practice in relation to official statistics.

The Statistics Authority has two main functions:

1. oversight of the Office for National Statistics (ONS) – the executive office of the Authority;
2. independent scrutiny (monitoring and assessment) of all official statistics produced in the UK.

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NATIONAL STATISTICS STATUS

National Statistics status means that official statistics meet the highest standards of trustworthiness, quality and public value.



All official statistics should comply with all aspects of the *Code of Practice for Official Statistics*. They are awarded National Statistics status following an assessment by the Authority's regulatory arm. The Authority considers whether the statistics meet the highest standards of Code compliance, including the value they add to public decisions and debate.

It is a producer's responsibility to maintain compliance with the standards expected of National Statistics, and to improve its statistics on a continuous basis. If a producer becomes concerned about whether its statistics are still meeting the appropriate standards, it should discuss its concerns with the Authority promptly. National Statistics status can be removed at any point when the highest standards are not maintained, and reinstated when standards are restored.

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Foreword

Few would disagree that population statistics are as central to a national statistical system's infrastructure as roads are to a country's transport system or the national grid is to its power supply, and so need to meet the highest standards of trustworthiness, quality and value. They provide a detailed picture of the size and composition of the country's population, the drivers for change, and – reflecting well-documented assumptions – the way in which it might change in the years ahead. And in general they do so consistently and coherently from the level of the UK down to very small building blocks. Like all infrastructure, population statistics benefit from regular review and improvement.

This suite of assessment reports – covering population estimates and projections produced about all four administrations of the UK – finds much to celebrate. The good examples of joint working between the four bodies producing population statistics across the UK provide the opportunity and the platform to ensure the continuing coherence and comparability of these statistics. This joint working can ensure that any divergence – in definitions, methods or production arrangements – is justifiable and minimised. The producers' engagement with users exploits a range of methods including groups of expert users, mailing lists and, online fora, reflecting the different user needs.

During the Assessments we found evidence that the resources devoted to population statistics across most of the UK are under significant pressure, exemplified by reductions in the frequency and level of detail of some statistics. And ONS's capacity to provide timely methodological and research leadership across the UK may be at risk, with potentially far-reaching adverse consequences.

Resource constraints limit producers' ability to actively harness the wider expertise that exists within the UK and internationally and reduces their ability to address the recommendation from the recent European peer review¹ of the UK's statistics to 'harmonise UK statistics in order to ensure coherence and comparability in the production of official statistics within the UK, over time and among producers of statistics' in relation to population estimates and projections. And the engaged and knowledgeable users who interact with producers have diverse interests that need to be taken into account in developing methods and outputs – placing further demand on resources – and there are more users with whom dialogue is less well established.

We conducted this series of Assessments reflecting existing methods used to produce population statistics. But we recognise that changes are already happening and will intensify over the next decade. The continuing growth in the use of administrative data and the work being done to reduce dependency upon costly traditional decennial censuses, has the potential to radically alter the landscape for population statistics. It will provide new sources with potential to inform the production and assurance of population estimates and projections. And proposed improvements to the legal base for data sharing would enable more value to be derived from data already held by government – this is in itself a powerful stimulus for improved data sharing legislation.

¹ <http://ec.europa.eu/eurostat/documents/64157/4372828/2015-UK-report/d44f7d3f-64c1-4450-8a37-bfad8542607>

Taking forward actions to meet the specific Requirements in this report will enhance the trustworthiness, quality and value of these statistics, and will earn them the continued right to be labelled as National Statistics. But – because of their position in the UK statistics infrastructure – producers need to be far-sighted to counter the challenges of reducing resources and make the most of the opportunities of administrative data and census replacement to add further value to these statistics. Until then, it is vital that resources are maintained and that the statistics can continue to flourish while the longer term changes take full effect.

Ed Humpherson

Director General for Regulation, UK Statistics Authority

1 Summary of findings

Introduction

- 1.1 This is one of a series of reports² prepared under the provisions of the *Statistics and Registration Service Act 2007*³. The Act gives the Statistics Authority power to re-assess whether the *Code of Practice for Official Statistics*⁴ continues to be complied with in relation to official statistics already designated as National Statistics. The report covers the following population estimates and projections (population) statistics produced by the National Records of Scotland (NRS) for Scotland and reported in:
- *Mid-year Population Estimates Scotland*⁵
 - *Small Area Population Estimates Scotland*⁶ (SAPE)
 - *Population Estimates for Settlements and Localities in Scotland*⁷
 - *Centenarians in Scotland*⁸
 - *Projected Population of Scotland*⁹
 - *Population Projections for Scottish Areas*¹⁰
 - *Population Projections for Scotland's Strategic Development Plan Areas and National Parks*¹¹
- 1.2 This report forms part of a broader assessment of sets of population statistics across the UK that are produced by the Office for National Statistics (ONS); the Welsh Government; NRS and the Northern Ireland Statistics and Research Agency (NISRA). Assessment reports 309, 310 and 312 examine the population statistics for England, Wales and Northern Ireland respectively.
- 1.3 The previous assessment of these sets of statistics was included in Assessment report 113¹². They are among the UK's most prominent National Statistics and are being re-assessed because they are an important input to national and local planning activity and to a large number of economic and social statistics.

² <http://www.statisticsauthority.gov.uk/assessment/assessment-reports/index.html>

³ http://www.opsi.gov.uk/Acts/acts2007/pdf/ukpga_20070018_en.pdf

⁴ <http://www.statisticsauthority.gov.uk/assessment/code-of-practice/index.html>

⁵ <http://www.nrscotland.gov.uk/statistics-and-data/statistics/statistics-by-theme/population/population-estimates/mid-year-population-estimates>

⁶ <http://www.nrscotland.gov.uk/statistics-and-data/statistics/statistics-by-theme/population/population-estimates/special-area-population-estimates/small-area-population-estimates>

⁷ <http://www.nrscotland.gov.uk/statistics-and-data/statistics/statistics-by-theme/population/population-estimates/special-area-population-estimates/settlements-and-localities>

⁸ <http://www.nrscotland.gov.uk/statistics-and-data/statistics/statistics-by-theme/population/population-estimates/estimates-of-special-populations/population-estimates-for-scottish-centenarians>

⁹ <http://www.nrscotland.gov.uk/statistics-and-data/statistics/statistics-by-theme/population/population-projections/population-projections-scotland>

¹⁰ <http://www.nrscotland.gov.uk/statistics-and-data/statistics/statistics-by-theme/population/population-projections/sub-national-population-projections>

¹¹ <http://www.nrscotland.gov.uk/statistics-and-data/statistics/statistics-by-theme/population/population-projections/population-projections-for-scotland%E2%80%99s-sdp-areas-and-national-parks>

¹² <http://www.statisticsauthority.gov.uk/assessment/assessment-reports/assessment-report-113---statistics-on-population-and-demography-in-scotland.pdf>

- 1.4 This report was prepared by the Authority's Assessment team, and approved by the Regulation Committee on behalf of the Board of the Statistics Authority, based on the advice of the Director General for Regulation.

Decision concerning designation as National Statistics

- 1.5 The Authority judges that the statistics covered by this report are readily accessible, produced according to sound methods and managed impartially and objectively in the public interest, subject to any points for action in this report. The Authority confirms that the population statistics for Scotland are designated as National Statistics, subject to NRS implementing the Requirements listed in paragraph 1.9 and reporting them to the Authority by January 2016. The exception is for Requirement 3 in the case of *Mid-2014 Population Estimates for Settlements and Localities in Scotland*, *Population Projections for Scottish Areas (2014-based)*, and *Population Projections for Scotland's Strategic Development Plan Areas and National Parks (2014-based)*, where the deadline is the next publication of those reports. NRS should however provide sufficient evidence to the Authority ahead of the next publication of each report listed, to demonstrate that the forthcoming publication will fully comply with the *Code of Practice*.

Summary of strengths and weaknesses

- 1.6 NRS actively engages with users from a broad spectrum of backgrounds, both via its main user group, Population and Migration Statistics Committee (Scotland)¹³ (PAMS), which is attended by users of these statistics, and through the ScotStat mailing list, which covers over 1,000 users, many of whom are non-expert. The statistics team regularly consults users of these statistics about issues of methodology, quality and dissemination. They are also open and clear about any revisions or corrections to the statistics, informing users immediately of any changes to the statistics and the impact that these changes will have on their use.
- 1.7 The population estimates and projections reports all contain useful commentary which adds context to the statistics, and each are accompanied by a metadata document which includes information about the data sources, accuracy of the data and comparability. Most of the reports are also published alongside a methodology and quality document, and there is evidence that there is a lot of development work being undertaken in this area. However, NRS does not always make it clear where to find the relevant information and how all the data quality work fits together.

¹³ <http://www.nrscotland.gov.uk/statistics-and-data/statistics/user-consultations-groups-and-seminars/the-population-and-migration-statistics-committee-scotland-pams>

Detailed recommendations

- 1.8 The Assessment team identified some areas where it felt that NRS should improve the production and presentation of population statistics for Scotland. Those which are essential for NRS to address in order to strengthen its compliance with the *Code* and to enable designation as National Statistics are listed – as Requirements – in paragraph 1.9, alongside a short summary of the key findings that led to each Requirement being made. Other recommended changes, which the Assessment team considers would improve the statistics and the service provided to users but which are not formally required for their designation as National Statistics, are listed – as Suggestions – in paragraph 1.10.

Requirements for designation as National Statistics

- 1.9 This section includes those improvements that NRS is required to make in respect of its statistics on population estimates and projections in order to fully comply with the *Code of Practice for Official Statistics*, and to enable designation as National Statistics.

Finding	Requirement	
Many of the statistics team who produce these statistics are not on permanent contracts with NRS. NRS should:	1	Review the resources allocated to the production of these statistics, and the impact of its reliance of staff on fixed term contracts, to ensure that resources are sufficient to meet the standards of the <i>Code of Practice</i> and the obligation within it to serve the public good and publish the outcome of its review (para 3.5).
NRS has not updated its Statement of Administrative Sources (SoAS) since 2010. NRS should:	2	Review its SoAS to ensure that all the administrative data sources used to produce its population estimates and projections statistics: <ul style="list-style-type: none"> a) are clearly and accurately listed b) include appropriate descriptions of the quality assurance processes (para 3.6).
NRS carries out detailed quality assurance of the administrative data sources used to produce these statistics. However, it is not sufficiently referenced or signposted from the statistical reports or on the population and	3	Reference, or link to, relevant information about data assurance arrangements for administrative data from all population estimates and projections reports and the population statistics section of its website, taking into consideration the Authority's <i>Administrative Data Quality Assurance Toolkit</i> , including: <ul style="list-style-type: none"> a) vital events documentation about the

<p>projections section of NRS's website. NRS should:</p>		<p>quality assurance of births and deaths data</p> <p>b) quality assurance procedures between NRS and NHS Central Register</p> <p>c) 2021 Census research documentation about the quality of the administrative data sources used in the production of the population estimates</p> <p>(para 3.13).</p>
<p>NRS publishes detailed quality information about all of its population reports except for <i>Centenarians in Scotland</i>. NRS should:</p>	<p>4</p>	<p>Review and update quality documentation about <i>Centenarians in Scotland</i>, including information about:</p> <p>a) quality assurance procedures that are made on the data</p> <p>b) strengths and limitations of the data</p> <p>(para 3.17).</p>
<p>NRS, along with ONS, NISRA and the Welsh Government, have not regularly updated the population comparison documents. NRS should:</p>	<p>5</p>	<p>a) ensure that the remaining comparison document on the population estimates and projections produced in all countries in the UK is updated and published as planned</p> <p>b) carry out, and publish, a review of the methodological and comparability differences and, based on knowledge of the uses of the statistics and expert input, evaluate whether the differences are justifiable</p> <p>As part of meeting this Requirement, NRS should work together with ONS, the Welsh Government and NISRA.</p> <p>(para 3.21).</p>

Suggestions for extracting maximum value from the statistics

1.10 This section includes some suggestions for improvement to NRS's statistics on population estimates and projections, in the interest of the public good. These are not formally required for designation, but the Assessment team considers that their implementation will improve public confidence in the production, management and dissemination of official statistics.

We suggest that NRS:

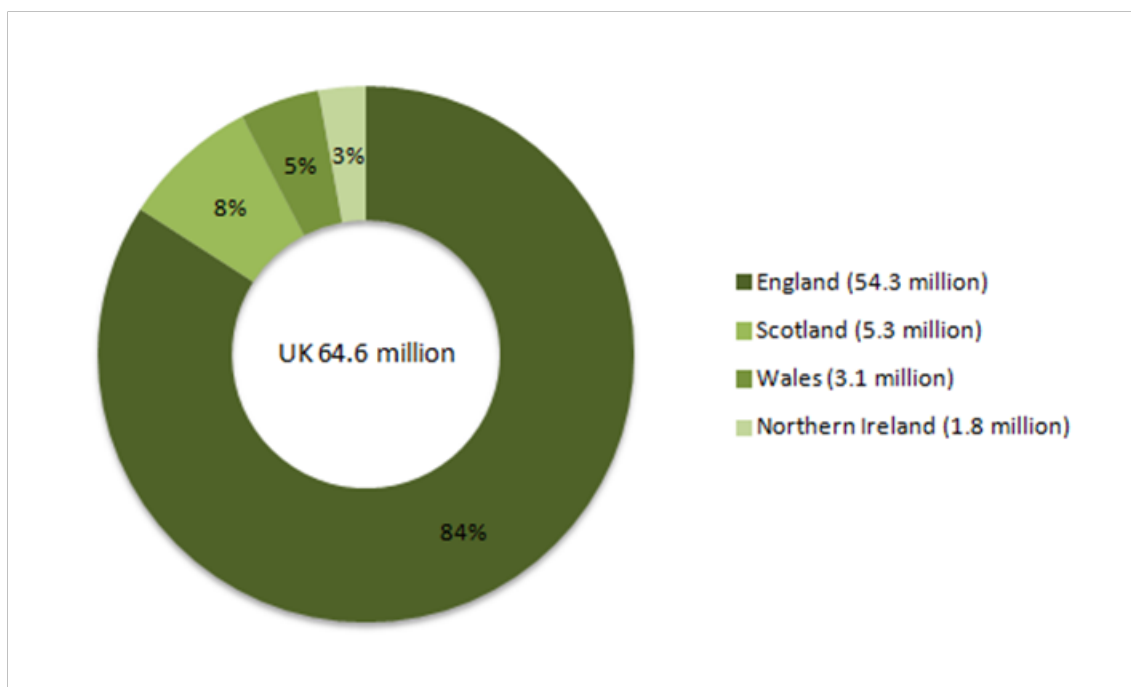
1	Reference, or link to, information about the UK strategy groups on population statistics from its website (para 3.1).
2	Work closely with statistical producers in ONS, Welsh Government and NISRA to clarify data assurance arrangements for administrative data (para 3.14).
3	Develop a process map to illustrate the supply of data used to produce the various population statistics that are included in this Assessment (para 3.14).
4	Produce the quality assurance tool for comparing different data sources of population estimates on a more regular basis (para 3.18).
5	Add a link to the Scottish Government Revisions Policy from all the population estimates and projections statistical reports (para 3.24).
6	Reference, or link to, the UK Population Revisions Policy from each 'About this publication' document and the population estimates and projections statistical reports (para 3.24).
7	Consider the points detailed in annex 1 and annex 2 in order to enhance the statistical reports (para 3.25).
8	Publish maps for settlements and localities in more-accessible ways (para 3.27).
9	Review the <i>Statement of Compliance with the National Statistics Code of Practice and Protocols</i> and update where necessary (para 3.29).

2 Subject of the assessment

Population Statistics across the UK

2.1 Population statistics are an essential part of the UK's statistics infrastructure. They describe the size and structure of the population of the UK, illuminate how and why the population is changing, and project how it might change in the future. The statistics play a vital part in planning and inform decision making from national to local level and are a building block in the development of a large number of economic and social statistics. Figure 1 shows the estimated size of UK population – 64.6 million, which was an increase of 0.77 per cent on the 2013 estimate – and its constituent parts at 30 June 2014.

Figure 1: Mid-year population estimates for the UK mid-2014



Source: Office for National Statistics, National Records of Scotland, Northern Ireland Statistics and Research Agency, as presented in *Mid-year population estimates 2014*¹⁴

Note: Numbers do not add exactly due to rounding

2.2 In the UK, population size is estimated annually at 30 June. Annual estimates take into account births, deaths and changes to population through internal and international migration since the previous year. They are made using the detailed estimates of population that are produced from the population census¹⁵ as a baseline; this baseline is updated every ten years.

2.3 Population projections are currently produced every second year in the UK. They are based on mid-year estimates and a set of assumptions about future changes to births, deaths and migration. The population projections are trend based. They are not policy-based forecasts of what the government expects to

¹⁴ http://www.ons.gov.uk/ons/dcp171778_406922.pdf

¹⁵ In the UK there are three population censuses: England and Wales census, Scotland census, and Northern Ireland census. In this report 'census' will refer to the population census for Scotland unless otherwise specified

happen. Instead they show the consequences of present demographic trends. They are less reliable in periods of rapid change. Variant projections illustrate how the size of the population would change if the assumptions that were made about fertility, mortality and migration changed.

- 2.4 Four organisations – ONS, the Welsh Government, NRS and NISRA – produce population estimates and projections that cover all or part of the UK. ONS produces population estimates for England and Wales and for the UK as a whole, and NRS and NISRA produce their own population estimates for Scotland and Northern Ireland respectively. ONS also produces national population projections for the UK and each of the constituent countries – England, Wales, Scotland and Northern Ireland – and sub-national projections for England. The Welsh Government, NRS and NISRA produce their own sub-national projections for Wales, Scotland and Northern Ireland respectively.
- 2.5 The four producers publish statistics in separate publications that cover the UK as a whole; the constituent countries and administrations; sub-national geographies such as local authorities; and selected population sub-groups. The main differences in the publications are:
- in the specific lower geographies for which estimates and projections are published
 - in the publication by estimates of marital status: ONS is the only producer who publishes national population estimates – for England and Wales combined – by marital status; currently NRS is consulting users about the demand for marital status estimates for Scotland
 - in the detail of the estimates of the very old: ONS publishes national estimates of the number of people aged 90 or over for England and Wales combined, as do NRS for Scotland; NISRA publishes estimates for Northern Ireland for people aged 85 or over
- 2.6 Further detail of the primary and processed data sources that NRS uses to produce the population estimates and projections and the data flows are described in paragraph 2.15 to 2.20 and shown in figure 2.

Population Statistics in scope of this assessment

- 2.7 NRS produces a range of statistical reports on population and projections:
- *Mid-year Population Estimates Scotland* is published annually and presents statistics on the population of Scotland and its administrative areas. The statistics are based on the latest census data and take account of the population changes since the census using data from administrative sources covering the components of population change – births, deaths and migration. The report presents statistics on the population of Scotland by age, sex, and administrative area, as well as statistics on the components of change. It also includes historical information and population densities. The population estimates in this report are used to measure progress towards the Scottish Government target to match average European (EU15) population growth over the period from 2007 to 2017¹⁶. ONS uses the population

¹⁶ <http://www.gov.scot/About/Performance/scotPerforms>

estimates to produce UK population estimates. NRS publishes supplementary tables on migration, and the latest report also includes two infographics

- *Small Area Population Estimates Scotland (SAPE)* is published annually and presents population estimates for Scotland at data zone¹⁷ level. It also produces population estimates for other geographies, such as Scottish Index of Multiple Deprivation deciles, in response to user demand. These are derived from best-fit data zone estimates. SAPE and other derived area statistics are made available on the Scottish Neighbourhood Statistics¹⁸ website
- *Population Estimates for Settlements and Localities in Scotland* is published every two years and presents estimates of the number of people living in 'built-up' areas of Scotland. These areas are the readily identifiable towns and cities of Scotland, rather than administrative areas such as local authorities or NHS health boards. The statistics are based on the SAPE, but use additional postcode level information to produce boundaries that are close approximations to towns and cities
- *Centenarians in Scotland* is published annually and presents an analysis of those people aged 90 to 104 by single year of age and the total number of people aged 105 and over in Scotland. It also includes a breakdown by sex
- *Projected Population of Scotland* is published every two years and presents an estimate of the future population of Scotland, and some variant projections (alternative projections based on different underlying assumptions). ONS produces the UK and constituent country national projections, but responsibility for the publication of the projections rests with each devolved administration. The national reports are co-ordinated for release on the same day. The projections are trend based and do not, for example, take account of future policy. The Government Actuary's Department was responsible for producing the projections from the first estimates in 1954 until 2006. The latest NRS release concentrates on the period up to 2037, although it occasionally refers up to 75 years ahead
- *Population Projections for Scottish Areas* is published every two years and presents population projections for local authority and NHS health board areas of Scotland. These statistics are consistent with the national projections produced by ONS. The projections are broken down by age and sex and include information about the effects of migration, fertility and mortality. In response to user requests, the report also includes additional sub-national variant projections
- *Population Projections for Scotland's Strategic Development Plan Areas and National Parks* is published every two years and presents principal and variant projections of the population in Scotland's Strategic Development Plan (SDP) areas and National Parks. The latest release includes projections up to 2037 based on the estimated population of these areas in mid-2012. National Parks are protected areas of countryside, wildlife and cultural

¹⁷ There are 6,505 data zones in Scotland which are the standard small area geography used by the Scottish Government: <http://www.scotland.gov.uk/Publications/2004/02/18917/33244>

¹⁸ www.sns.gov.uk

heritage. SDP areas cover the regions around Aberdeen, Dundee, Edinburgh and Glasgow. The four SDP areas were created in November 2008 to aid strategic development planning

- 2.8 In addition to the reports covered by this assessment, NRS produced *Mid-year Marital Status Population Estimates*¹⁹ until October 2009. This included mid-year population estimates of Scotland broken down by marital status, single year of age and sex. These statistics were confirmed as National Statistics as part of Assessment report 113 but, due to a lack of user demand – which was documented in the analysis of responses to NRS’s 2010/11 consultation on the demography statistical work programme²⁰ – they have not been published since October 2009. NRS has recently carried out another user consultation on its demographic statistics products (see paragraph 3.4), which again included a review of user demand for the marital status statistics. NRS published a summary of responses to the consultation²¹ shortly before the publication of this Assessment report and this identified some limited user demand for these statistics. NRS has not yet confirmed whether it will publish its *Mid-year Marital Status Population Estimates* in the future. The National Statistics status of these statistics will be reviewed once their future publication is confirmed.

Users and uses of Population Statistics

- 2.9 These statistics are widely used by a variety of organisations and individuals for a range of different purposes:
- the Scottish Government uses the population estimates and projections to inform policy decisions, for example on health and education, and to inform the way that it distributes grants. The statistics are also used to monitor progress towards meeting some of Scottish Government’s Purposes, National Outcomes, and Indicators as part of the Scotland Performs programme²²
 - local authorities use the statistics to help deliver services and to identify future spending priorities
 - academics use the statistics to inform research in a range of areas including health, deprivation and the economy
 - the statistics are used to calculate rates (as the denominator), and to weight survey data in order to estimate results for the whole population

History and governance

- 2.10 Population estimates and projections statistics for Scotland are produced by the Demography Statistics Area within NRS. The area is responsible for producing statistics on births, deaths and migration as well as population estimates and projections.

¹⁹ <http://www.nrscotland.gov.uk/statistics-and-data/statistics/statistics-by-theme/population/population-estimates/estimates-of-special-populations/marital-status-population-estimates>

²⁰ <http://www.nrscotland.gov.uk/files//statistics/consultation-groups/stats-consultation-analysis-report.pdf>

²¹ <http://www.nrscotland.gov.uk/files//statistics/consultations/demo-stats-2015/demographic-statistics-consultation-report.pdf>

²² <http://www.scotland.gov.uk/About/scotPerforms/indicators>

- 2.11 NRS was established on 1 April 2011, following the merger of the General Register Office for Scotland (GROS) and the National Archives of Scotland. NRS is responsible for carrying out the registration and statistical functions of the Registrar General for Scotland, which includes the production of demographic statistics and carrying out the census. Prior to the establishment of NRS, GROS produced population estimates of Scotland from 1855, when civil registration of births, deaths, marriages and divorces began. Population projections have been produced for Scotland since 1954.
- 2.12 NRS's main consultation group is PAMS²³. PAMS meets twice a year and is used as an advisory group by NRS, who lead the group. The membership of PAMS comprises users from a range of different backgrounds, including representatives from Scottish Government, local authorities, Information Service Division of NHS National Services Scotland (ISD), ONS, Convention of Scottish Local Authorities, voluntary organisations and academics. NRS uses PAMS to consult its users about a wide range of issues related to Scottish demographic statistics, such as methodology, quality, and dissemination of the statistics.
- 2.13 At the May 2014²⁴ PAMS meeting, a decision was made to disband a working group on small area population estimates that had been set up in 2002 to develop a method to produce small area population estimates. Although this group has been disbanded, relevant members of PAMS occasionally meet when required to discuss specific methodological issues relating to small areas population estimates.
- 2.14 NRS is an active member of the UK Population Theme Group²⁵ and the UK Population Theme Advisory Board²⁶. These groups are both chaired by ONS and attended by representatives from ONS, the Welsh Government, NRS and NISRA, along with other relevant users such as academics, to produce a strategic and co-ordinated approach to statistical planning across the UK, including improving the quality of statistics and analysis. The national projections output is also overseen by the National Population Projection committee made up of representatives from ONS, the Welsh Government, NRS, NISRA and the Home Office.

Data sources and flows

- 2.15 Population estimates for Scotland draw on data – for births, deaths and migration – that NRS processes, as well as directly from primary data sources. The primary source data – including those processed by NRS – are drawn from administrative systems, the census and the International Passenger Survey, which is run by ONS. These primary and processed data flow between different teams in NRS, and between NRS and ONS.
- 2.16 Separate teams within NRS variously:

²³ See footnote 13

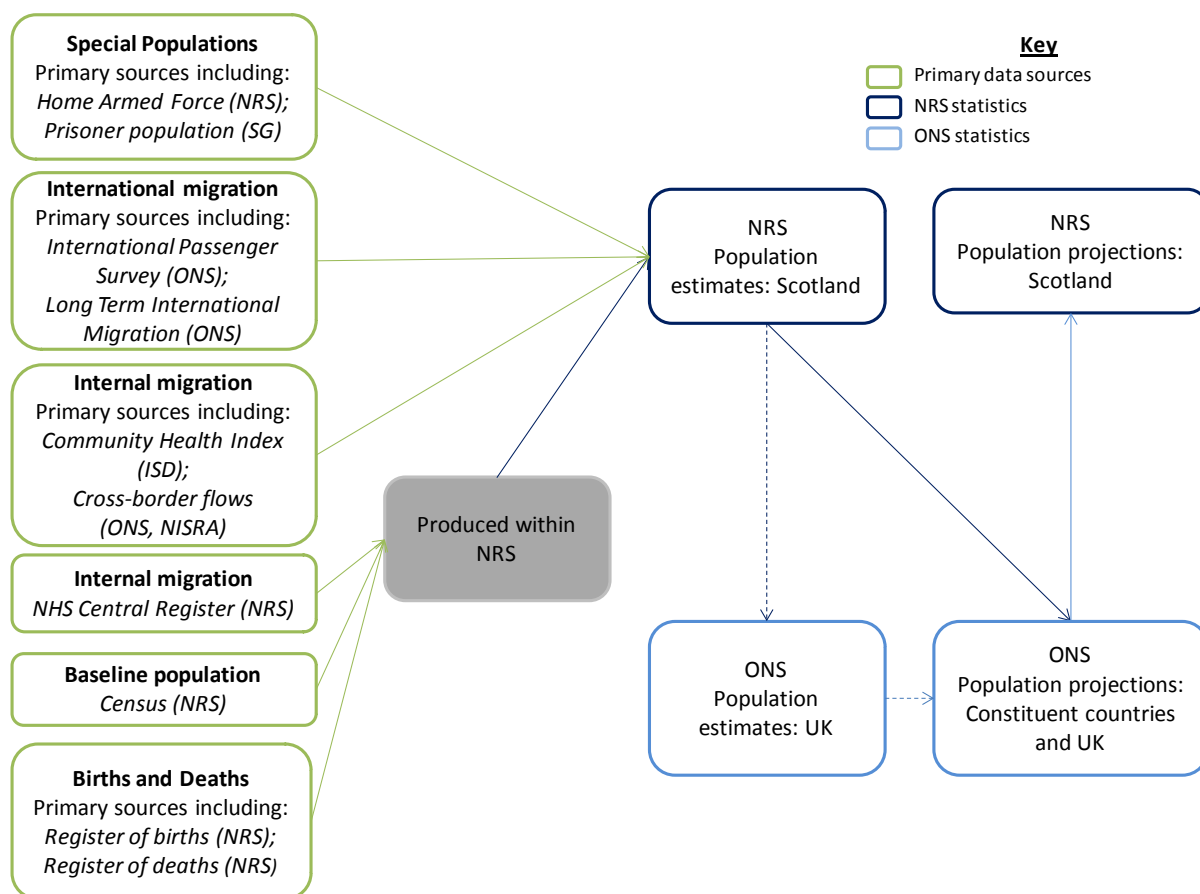
²⁴ <http://www.nrscotland.gov.uk/files//statistics/consultation-groups/pams-12-may-2014/paper12-pams-14-12-minutes-12-may-14-corrected.pdf>

²⁵ <http://www.ons.gov.uk/ons/guide-method/method-quality/specific/population-and-migration/population-statistics-meetings-and-user-groups/population-theme-group/index.html>

²⁶ <http://www.ons.gov.uk/ons/guide-method/method-quality/specific/population-and-migration/national-statistics-centre-for-demography-advisory-board/index.html>

- conduct the census in Scotland and process census data
 - administer NRS's Forward Electronic Register system that local registrars use to record and process data about births and deaths
- 2.17 ONS – which manages and processes the International Passenger Survey (IPS) – supplies data about international migration to NRS. The statistics team that produces the population estimates and projections also produces estimates of internal migration. ONS, NRS and NISRA share data between them on cross-border migration flows between each of the constituent countries of the UK.
- 2.18 NRS supplies the Scottish mid-year estimates and estimates of older people data that it produces for Scotland, to ONS. ONS combines these with the equivalent data supplied to them by NISRA for Northern Ireland, and its own estimates for England and Wales, to produce mid-year estimates and estimates of the number of older people across the UK.
- 2.19 ONS produces population projections for the UK and all the constituent countries within the UK using data from the mid-year population estimates. NRS publishes a report on the national population projections for Scotland and produces population projections for areas within Scotland.
- 2.20 Figure 2 shows a simplified diagram of the data sources, processing and data flows for the production of population estimates and projections for Scotland, and for the UK.

Figure 2: Main data suppliers, sources and flows: Population estimates and projections for Scotland



Source: produced by Assessment team

Note: This diagram is a simplified summary of the flow of data from primary source through to UK level population estimates and projections. It groups together the publications for Scotland with those for areas within Scotland, and by demographic group. It refers to sources by their more common, rather than technical, names.

Open Data and Costs

2.21 NRS publishes the population estimates and projections reports in PDF format, with tables published in Excel, CSV and PDF formats. *Mid-2014 Population Estimates Scotland* also includes two supplementary infographics which are available in Scalable Vector Graphics (SVG) and PDF formats. This equates to a level of three stars under the Five Star Scheme referenced in the Scottish Government's Open Data Strategy²⁷. The strategy states that all public sector organisations in Scotland should 'seek to publish our data as 3* and work towards where appropriate, and there is demand, offering it in higher formats'. Five stars represents the highest star rating within the Scheme.

2.22 NRS estimates that the cost of producing the population statistics for Scotland, based on full economic costing and excluding the cost of data collection, is approximately £324,327.

²⁷ <http://www.gov.scot/Resource/0047/00472007.pdf>

3 Assessment findings

User Engagement

- 3.1 NRS's main engagement with users of these statistics is through PAMS (see paragraph 2.12 for more detail about this group), which meets twice a year. PAMS includes a wide range of users, both within central and local government as well as academics and consultancy groups. NRS regularly consults PAMS about a wide range of issues. For example, NRS consulted PAMS members at the May 2015 meeting on potential methodology options for producing single year of age estimates for the very elderly for areas within Scotland²⁸. NRS publishes the agenda, papers and minutes of the PAMS meetings promptly on its website. These papers often include the views of the group on issues that NRS has consulted users about, and the reasons for the final decisions made by NRS, showing evidence that NRS considers users' views to inform decisions. NRS is also an active member of several population statistics strategy groups which cover the whole of the UK (see paragraph 2.14). Information about these groups, including minutes of the meetings, is published on ONS's website. However, NRS does not reference, or link to, the information about these groups from its website. We suggest that NRS reference, or link to, information about the UK strategy groups on population statistics from its website.
- 3.2 To engage with a wider range of users, NRS regularly contacts relevant users on the ScotStat²⁹ mailing list, which includes over 1,000 users of population statistics. For example, ScotStat members were emailed in February 2015 to inform them about the user consultation on demographic statistics products. It has also been used to consult users about changes in methodology, and to inform users of changes in publication dates or outputs. The ScotStat mailing list includes a wide user group, ranging from expert to casual users, both within and outside government. NRS also engages with users through membership of, and liaison with, groups which use population and projections data, and through arranging meetings, roadshows and seminars with users of the statistics.

Statistical Planning and Resourcing

- 3.3 NRS publishes a statistics plan³⁰ each year, which highlights its priorities, publications and future developments for all the statistical outputs that it produces, including those covered by this assessment. NRS consults PAMS on the statistics plan before it is finalised to ensure that it best meets users' needs. The statistics plan for 2015/16³¹ was presented to PAMS at its May 2015 meeting and published in June 2015.

²⁸ <http://www.nrscotland.gov.uk/files//statistics/consultation-groups/pams-6-may-15/paper11-pams-15-11-methodology-update-90%2B.pdf>

²⁹ ScotStat is a network for users and providers of Scottish official statistics, which aims to improve communication amongst those interested in particular statistics

³⁰ <http://www.nrscotland.gov.uk/statistics-and-data/statistics/about-our-statistics/what-we-do/demography-division-statistics-plan>

³¹ <http://www.nrscotland.gov.uk/files//statistics/statistics-plan/stats-plan-2015-16.pdf>

- 3.4 During this assessment NRS carried out a user consultation on its demographic statistics products 'to obtain feedback on the need for and use of these outputs to ensure that we continue to produce the statistics that meet user needs'. NRS told us that the results from the consultation would inform future decisions on potential reductions to some of its outputs to enable them to best meet users' needs within their resources. The consultation ran from 11 February to 22 April 2015 and NRS published a summary of responses to the consultation³² in July 2015 shortly before this Assessment report was published. The summary said that NRS was considering the responses to inform decisions about improving and making changes to outputs.
- 3.5 NRS follows the Scottish Government resourcing policy, which is led by the Scottish Government's Human Resources division and the Office of the Chief Statistician and Performance division for resourcing of statistical staff. Eight NRS staff members produce the statistics on population estimates and projections. However, only six have permanent contracts, with the remainder on fixed term contracts. The statistics team told us that this mix of permanent and temporary staff varies from year to year and sometimes made it difficult to retain staff, which leads to additional time and resource being required to train new staff. Additional funding and resources are sometimes made available from Scottish Government and ISD to carry out specific pieces of work, such as the production of mid-2014 small area population estimates on the 2001 data zone boundaries. The statistics team also told us that it expects to have three posts vacant for several months over the summer, which should be filled by new recruits after the external recruitment exercise, run by the Scottish Government, is carried out in August. Some users told us that they felt that NRS could produce the statistics more quickly if it had more resources. We consider that there is a risk that NRS may not be able to meet users' needs, at least in the short-term. For example, updating a sub-national population projections accuracy report published in 2006³³ cannot currently be prioritised due to resources. As part of the designation as National Statistics, NRS should review the resources allocated to the production of these statistics, and the impact of its reliance of staff on fixed term contracts, to ensure that resources are sufficient to meet the standards of the *Code of Practice* and the obligation within it to serve the public good and publish the outcome of its review³⁴ (Requirement 1).

³² See footnote 21

³³ <http://www.nrscotland.gov.uk/files/statistics/ppwg06-09-accuracy-sub-national-pop-proj-scotland.pdf>

³⁴ In relation to Principle 7, Practice 1 of the *Code of Practice*

Quality and Methods

Quality Assurance of Administrative Data

Suggestions from previous Assessment report 113 (May 2011):

- Improve the availability of information about the quality of the administrative sources and in particular how it determines that each source is of sufficient quality for the intended use

- 3.6 NRS has published a corporate Statement of Administrative Sources (SoAS)³⁵ which identifies the administrative data sources used to produce NRS' statistical outputs, distinguishing between those data sources that are owned and managed by NRS, and those which are administered by other organisations. However, the SoAS has not been updated since 2010 and it does not include any information about audit arrangements that are in place to quality assure the data. As part of the designation as National Statistics, NRS should review its SoAS to ensure that all the administrative data sources used to produce its population estimates and projections statistics:
- a) are clearly and accurately listed
 - b) include appropriate descriptions of the quality assurance processes³⁶ (Requirement 2).
- 3.7 In January 2015 the Authority published a regulatory standard³⁷ that confirms the quality assurance arrangements that are required for statistics compiled using administrative data to comply with the *Code of Practice*. The *Administrative Data Quality Assurance Toolkit*³⁸ is the mechanism that the Authority is using to determine compliance in relation to four areas of practice:
- operational context and administrative data collection
 - communication with data supply partners
 - QA principles, standards and checks by data suppliers
 - producers' QA investigations & documentation
- 3.8 The judgment by statistical producers about the suitability of the administrative data for use in producing official statistics should be pragmatic and proportionate. It should be made in the light of an evaluation of the likelihood of quality issues arising in the data that may affect the quality of the statistics. It should also reflect the nature of the public interest served by the statistics. Statistical producers should determine the types of assurance and documentation required to inform users about the quality assurance arrangements for administrative data.

³⁵ <http://www.nrscotland.gov.uk/files/statistics/about/statement-of-admin-sources.pdf>

³⁶ In relation to Protocol 3, Practice 5 of the *Code of Practice*

³⁷ <http://www.statisticsauthority.gov.uk/assessment/monitoring/administrative-data-and-official-statistics/index.html>

³⁸ <http://www.statisticsauthority.gov.uk/assessment/monitoring/administrative-data-and-official-statistics/quality-assurance-toolkit.pdf>

- 3.9 The population statistics that are the subject of this assessment are produced within a complex data supply chain (figure 2 shows a simplified version). The statistics team should have reassurance of the quality of the data at each stage of the process to assess its suitability for use in the production of the population estimates.
- 3.10 The main data sources used in population estimates and projections data are birth and death registrations, NHS Central Register (NHSCR), Community Health Index (CHI) and the IPS. With the exception of the IPS, the remaining data sources are administrative. Birth and death registrations are carried out by registrars within NRS and the quality assurance processes for these data are well documented on NRS's website³⁹, including information about the quality of the data obtained through the registration process⁴⁰ and the checks carried out on these data by the vital events statistics team within NRS to ensure that they have been transferred appropriately and are fit for purpose⁴¹. However, this information is not referenced, or linked to, from the population statistics reports or the population statistics sections of NRS's website.
- 3.11 NRS assures the quality of the NHSCR and CHI data that it receives and feeds back any anomalies it finds to the suppliers. It maintains regular contact with the data suppliers, which enables it to stay informed of any quality issues related to the data to ensure that they do not impact on the quality of the population estimates. For example, between October 2012 and February 2013 NHSCR carried out a data cleaning exercise, which had the effect of artificially increasing the number of migrants into Scotland from the rest of the UK. Due to the close working relationship between NRS and NHSCR, the statistics team was able to identify the impact of this piece of work and made a suitable adjustment to the data used to produce the population estimates. This information is included in *Mid-2014 Population Estimates Scotland* but not in any of the other statistical reports.
- 3.12 As part of the research into the 2021 Census, NRS has produced a range of documents⁴² describing its assessment of the quality of the administrative data sources used in the production of the population estimates. These are referenced, and linked to, from *Mid-2014 Population Estimates Scotland* but not from any of the other statistical reports.
- 3.13 As part of the designation as National Statistics, NRS should reference, or link to, relevant information about data assurance arrangements for administrative data from all population estimates and projections reports and the population statistics section of its website, taking into consideration the Authority's *Administrative Data Quality Assurance Toolkit*⁴³, including:
- a) vital events documentation about the quality assurance of births and deaths data

³⁹ <http://www.nrscotland.gov.uk/statistics-and-data/statistics/statistics-by-theme/vital-events/general-background-information/quality-of-national-records-of-scotland-nrs-data-on-vital-events>

⁴⁰ <http://www.nrscotland.gov.uk/files//statistics/vital-events/quality-data-obtained-from-registration-of-ve.pdf>

⁴¹ <http://www.nrscotland.gov.uk/files//statistics/vital-events/checking-quality-nrs-statistical-data-on-ve.pdf>

⁴² <http://www.nrscotland.gov.uk/statistics-and-data/beyond-2011-the-future-of-census-statistics/reports-and-research>

⁴³ See footnote 38

- b) quality assurance procedures between NRS and NHSCR
- c) 2021 Census research documentation about the quality of the administrative data sources used in the production of the population estimates⁴⁴

(Requirement 3).

3.14 In meeting this requirement, we suggest that NRS work closely with statistical producers in ONS, Welsh Government and NISRA to clarify data assurance arrangements for administrative data. We further suggest that NRS develop a process map to illustrate the supply of data used to produce the various population statistics that are included in this Assessment.

Quality and Methodology Documentation

Requirements from previous Assessment report 113 (May 2011):

- Requirement 1: Improve the information available about the quality of the marital status estimates

3.15 For the key population estimates and projections outputs NRS publishes a methodology document, for example *Mid-year Population Estimates for Scotland: Methodology Guide*⁴⁵ and *Sub-national Population Projections for Scotland Methodology Guide*⁴⁶. They are written in Plain English so that they are easy for non-expert users to understand, and include links to other related or more-detailed documentation.

3.16 NRS's website contains a range of documents about development work on quality assurance and methodology changes that have been made to help to improve the quality of the statistics. The range of documents includes reconciliation reports comparing the 2011 Census results with the mid-year population estimates⁴⁷ and the small area population estimates⁴⁸. Many of these documents are linked to from the relevant statistical reports.

3.17 Each of the population estimates and projections reports contains information about methodology and quality assurance of the data. However, *Centenarians in Scotland* contains limited information about the quality of the data, stating only that they are 'broadly similar to comparable data available from the Department for Work and Pensions and broadly consistent with data published from the 2011 Census'. *Centenarians in Scotland* does not include information about what quality assurance procedures are made on the data or the data limitations for users. As part of the designation as National Statistics, NRS

⁴⁴ In relation to Principle 4, Practice 2, and Principle 8, Practice 1 of the *Code of Practice*

⁴⁵ <http://www.nrscotland.gov.uk/files//statistics/population-estimates/midyear-2014/mye-methodology-guide-2014.pdf>

⁴⁶ <http://www.nrscotland.gov.uk/files//statistics/population-projections/2012-based-subnational/sub-national-pop-proj-methodology.pdf>

⁴⁷ <http://www.nrscotland.gov.uk/files/statistics/population-estimates/reconciliation-report/mye-reconciliation-report.pdf>

⁴⁸ <http://www.nrscotland.gov.uk/statistics-and-data/statistics/statistics-by-theme/population/population-estimates/special-area-population-estimates/small-area-population-estimates/2011-census-reconciliation-report>

should review and update quality documentation about *Centenarians in Scotland*, including information about:

a) quality assurance procedures that are made on the data

b) strengths and limitations of the data⁴⁹

(Requirement 4).

3.18 As part of the suite of documents published alongside the rebased 2002 to 2010 mid-year population estimates, NRS produced a quality assurance tool⁵⁰ in Excel format, which compares the revised and unrevised population estimates at local authority level by single year of age and gender. The tool also includes a comparison of the mid-year population estimates to other relevant data sources, such as child benefit and pensions data, which is a useful tool for assessing the variation in different data sources and the quality of the population estimates for different age groups and local authorities. However, this tool has not been produced for more recent population estimates. We suggest that NRS produce the quality assurance tool for comparing different data sources of population estimates on a more regular basis.

3.19 Each of NRS's reports is accompanied by an *About this publication*⁵¹ document, which contains useful information about data sources, timeliness, continuity of data, accuracy, completeness and comparability, in an easy to understand format.

Comparability and Coherence

Requirements from previous Assessment report 113 (May 2011):

- Requirement 2: Document how the population estimates, life expectancy statistics and marital status estimates compare with the equivalent statistics for the other countries of the UK, and the impact for users of the statistics

Suggestions from previous Assessment report 113 (May 2011):

- Work with ONS, the Welsh Government and NISRA to document how the statistics compare between each of the UK countries

3.20 The methods and data sources that NRS uses to produce population estimates and projections for Scotland are in some cases consistent with those that are used across the rest of the UK, but there are also some exceptions. The exceptions relate to the methods and data sources used to produce sub-national population projections, mid-year population estimates and small area population estimates.

⁴⁹ In relation to Principle 8, Practice 1 of the *Code of Practice*

⁵⁰ <http://www.nrscotland.gov.uk/files/statistics/population-estimates/reviced-pop-est-dec13/methodology/comparison-revised-pop-est-council-mid-02-mid-10.xls>

⁵¹ <http://www.nrscotland.gov.uk/files/statistics/population-estimates/midyear-2014/About%20this%20publication.pdf>

3.21 In response to Requirement 2 of Assessment report 113, NRS collaborated with ONS, the Welsh Government and NISRA to produce comprehensive documentation comparing the population estimates and projections produced in all countries in the UK. ONS – with input from the other organisations – published *Population estimates for local authorities across UK constituent countries: a comparison of data sources and methods*⁵². NISRA – again with help from the remaining organisations – published *Small Area Population Estimates Across the UK*⁵³, which includes broad descriptions of the methods used to produce small area statistics in each country of the UK. During this assessment ONS updated *Population estimates for local authorities across UK constituent countries: a comparison of data sources and methods* to take account of changes in methods and data sources since the document was first published. For example, the 2011 Census results have been published enabling methods, and differences in these methods, to be evaluated against a robust data source. During this assessment another comparison document, *Sub-National Population Projections Across the UK*⁵⁴, produced jointly by ONS, the Welsh Government, NRS and NISRA, was updated from the original publication of May 2010. The statistics team told us that *Small Area Population Estimates Across the UK* will be updated after all four UK countries have published their 2014 small area population estimates. As part of the designation as National Statistics, NRS should:

- a) ensure that the remaining comparison document on the population estimates and projections produced in all countries in the UK is updated and published as planned
- b) carry out, and publish, a review of the methodological and comparability differences and, based on knowledge of the uses of the statistics and expert input, evaluate whether the differences are justifiable⁵⁵

As part of meeting this Requirement, NRS should work together with ONS, the Welsh Government and NISRA (Requirement 5).

Revisions and Corrections

3.22 NRS clearly explains what revisions and corrections are, and the difference between them, on the ‘Revisions and Corrections’ section of its website⁵⁶. This section of the website also contains a list of all revisions and corrections that NRS has made to its statistical outputs since 2010, including a link to the relevant report. NRS also clearly highlights any revisions or corrections in the reports as soon as it becomes aware of them, providing an explanation of the reason for the revisions or corrections and an indication of the impact that each has on the use of the statistics. ScotStat users are also informed promptly via email.

⁵² <http://www.ons.gov.uk/ons/guide-method/method-quality/specific/population-and-migration/pop-ests/population-estimates-for-las/population-estimates-uk-comparisons-paper.pdf>

⁵³ http://www.nisra.gov.uk/archive/demography/population/small_area/UK_SAPE_Dec_2011.pdf

⁵⁴ <http://www.ons.gov.uk/ons/guide-method/method-quality/specific/population-and-migration/population-projections/subnational-population-projections-across-the-uk.pdf>

⁵⁵ In relation to Principle 4, Practice 6 and Principle 8, Practice 2 of the *Code of Practice*

⁵⁶ <http://www.nrscotland.gov.uk/statistics-and-data/statistics/about-our-statistics/revisions-and-corrections>

- 3.23 For example, an error was found in *Mid-2013 Population Estimates Scotland* shortly before it was due to be published. NRS chose to publish the Scotland level statistics (which were not affected by the error) as scheduled. Users were informed immediately of the error in the local authority level statistics, and of the decision to change the publication date, via a ScotStat email and a notification was clearly posted on NRS's website. The local authority statistics were published a month later, after the error had been corrected.
- 3.24 The UK Population Revisions Policy⁵⁷ was developed jointly by ONS, the Welsh Government, NRS and NISRA and approved by Inter-Departmental Population Statistics Strategy Group and the Population Theme Group. The revisions policy is published on ONS's website. However, NRS does not provide a link to this document from its website. NRS applies the Scottish Government Revisions Policy⁵⁸ when making revisions and corrections to its population estimates and projections. A link to this policy is included in the revisions section of each of the *About this publication* documents (see paragraph 3.19 for more detail), which accompany the population estimates and projections reports. However, none of the reports include links to the revisions policy. We suggest that NRS add a link to the Scottish Government Revisions Policy from all the population estimates and projections statistical reports. We further suggest that NRS reference, or link to, the UK Population Revisions Policy from each *About this publication* document and the population estimates and projections statistical reports.

⁵⁷ <http://www.ons.gov.uk/ons/guide-method/revisions/revisions-policies-by-theme/population/population-statistics-revision-policy.pdf>

⁵⁸ <http://www.gov.scot/Topics/Statistics/About/CPsonRevisionsCorrections/Q/EditMode/on/ForceUpdate/on>

Publications, Dissemination and Accessibility

Requirements from previous Assessment report 113 (May 2011):

- Requirement 4: Ensure that all releases provide commentary that aids user interpretation
- Requirement 5: Review the summary text in the population projections release to convey more prominently the nature of projections and their difference from forecasts, to aid user understanding

Suggestions from previous Assessment report 113 (May 2011):

- Refer to the Statistics Authority's Standards for Statistical Releases for further guidance
- Include summaries of relevant PAMS papers, or links to the papers, within the published releases to enable users to identify and access information relevant to their needs
- Collaborate with Scottish Government colleagues who are working with the National Library of Scotland to ensure official statistics are appropriately archived
- Include summaries of relevant PAMS papers, or links to the papers, within the published releases to enable users to identify and access information relevant to their needs
- Provide links from downloadable tables of data to the relevant metadata

3.25 All the population estimates and projections reports produced by NRS include detailed analysis for a range of geographies and age breakdowns where appropriate, making good use of tables and charts to aid users' understanding of the data. The commentary adds context to the data and provides analysis of short- and long-term trends. It has also been internally checked using Plain English guidance to ensure that it is easy for non-expert users to understand. Each report includes information about methodology, quality and the limitations of the data, and is accompanied by an *About this publication* document, which contains useful metadata (see paragraph 3.19 for more detail). Some of the reports also reference other relevant documentation, including papers from PAMS meeting which explain why decisions on methodology and dissemination have been taken. In order to enhance the statistical reports, we suggest that NRS consider the points detailed in annex 1 and annex 2.

3.26 In response to Requirement 5 of Assessment report 113, NRS produced revised text on uses and limitations of projections which explains the differences between projections and forecasts, and what projections can be used for. This text is now included in all the projections reports and on a separate webpage⁵⁹ that is linked to from the main projections webpages on NRS's website.

⁵⁹ <http://www.nrscotland.gov.uk/statistics-and-data/statistics/statistics-by-theme/population/population-projections/uses-and-limitations-of-population-projections>

- 3.27 NRS publishes the population estimates and projections reports in PDF format and the tables are available in Excel, CSV and PDF formats. This equates to a level of three stars under the Five Star Scheme. *Mid-2014 Population Estimates Scotland*⁶⁰ also includes an infographic supplement, which is available in Scalable Vector Graphics (SVG) and PDF formats. The statistics team told us that it hopes to produce more infographics in the future. *Mid-year Population Estimates for Settlements and Localities in Scotland* provides maps of the settlement and locality areas in Shapefile format, which display spatial information about geographical areas and features. These files can be viewed using Geographical Information System⁶¹ (GIS) software, which is suitable for users of GIS. Users who do not have GIS software can access the maps by downloading the free ArcReader software⁶² from ESRI's website⁶³, but the maps are not made available in any other format, such as PDF. We suggest that NRS publish maps for settlements and localities in more-accessible ways.
- 3.28 When NRS was formed in April 2011 it continued to maintain two separate websites; one for what was previously known as General Register Office for Scotland, and one for what was previously known as the National Archives of Scotland. In September 2014 NRS launched a new website, which brought the content of these two websites together. The layout of the new website is easy to navigate and relevant data and documentation are appropriately signposted.

Confidentiality

Requirements from previous Assessment report 113 (May 2011):

- Requirement 3: Put in place written confidentiality protection agreements for all exchanges of confidential data

Suggestions from previous Assessment report 113 (May 2011):

- Provide more information on the use of the data from the Station Commanders return and how confidentiality will be protected, to encourage voluntary response

- 3.29 NRS published a *Statement of Compliance with the National Statistics Code of Practice and Protocols*⁶⁴ in March 2008, which set out the arrangements that it has put in place to protect the security and confidentiality of the statistical information held by NRS. The document covers physical, technical, organisational and disclosure security and includes links to other useful documentation such as the *Data Protection Act (1998)*⁶⁵ and the *Freedom of*

⁶⁰ <http://www.nrscotland.gov.uk/statistics-and-data/statistics/statistics-by-theme/population/population-estimates/mid-year-population-estimates/mid-2014>

⁶¹ GIS is a system designed to present and analyse spatial or geographical data

⁶² ArcReader is a free, easy-to-use desktop mapping application that allows users to view, explore, and print maps and globes

⁶³ ESRI is an international supplier of GIS software

⁶⁴ <http://www.nrscotland.gov.uk/files/statistics/data-access-and-confidentiality.pdf>

⁶⁵ <http://www.legislation.gov.uk/ukpga/1998/29/contents>

*Information (Scotland) Act 2002*⁶⁶. However, the *Statement of Compliance* has not been updated since it was first published. It therefore still refers to GROS rather than NRS, and it does not include information about the disclosure security for the 2011 Census, which had not yet been agreed at the time of publication. It also does not reference, or link to, the *Code of Practice*. We suggest that NRS review the *Statement of Compliance with the National Statistics Code of Practice and Protocols* and update where necessary.

⁶⁶ <http://www.legislation.gov.uk/asp/2002/13/contents>

Annex 1: Compliance with Standards for Statistical Reports

- A1.1 In November 2012, the Authority issued a statement on *Standards for Statistical Reports*⁶⁷. While this is not part of the *Code of Practice for Official Statistics*, the Authority regards it as advice that will promote both understanding and compliance with the *Code*. In relation to the statistical reports associated with population statistics for Scotland, this annex comments on compliance with the statement on standards. The comments included in this annex are based on a review of *Mid-2014 Population Estimates Scotland*⁶⁸, *Mid-2013 Small Area Population Estimates Scotland*⁶⁹, *Mid-2012 Population Estimates for Settlements and Localities in Scotland*⁷⁰, *Centenarians in Scotland, 2003 to 2013*⁷¹, *Projected Population of Scotland (2012-based)*⁷², *Population Projections for Scottish Areas (2012-based)*⁷³ and *Population Projections for Scotland's Strategic Development Plan Areas and National Parks (2012-based)*⁷⁴.
- A1.2 In implementing any Requirements of this report (at paragraph 1.9) which relate to the content of statistical reports, we encourage the producer body to apply the standards as fully as possible.

Include an impartial narrative in plain English that draws out the main messages from the statistics

- A1.3 The main points are clearly set out at the beginning of each of the statistical reports. However, the reports have a large number of main points. For example, the *Mid-2014 Population Estimates Scotland* report contains 14 bullet points of main points. The reports may benefit from reducing this number to four or five to enable users to more easily identify the key messages. Many of the reports are long but they contain a contents page to make it easier to reference the appropriate section of the report.
- A1.4 The commentary in all the reports is impartial and is written clearly. The reports include suitable comparisons – between areas within the country, by age and sex, and short- and long-term trends – that contribute to painting a full picture about the subject of the statistics.

⁶⁷ <http://www.statisticsauthority.gov.uk/news/standards-for-statistical-reports.html>

⁶⁸ <http://www.nrscotland.gov.uk/statistics-and-data/statistics/statistics-by-theme/population/population-estimates/mid-year-population-estimates/mid-2014>

⁶⁹ <http://www.nrscotland.gov.uk/statistics-and-data/statistics/statistics-by-theme/population/population-estimates/special-area-population-estimates/small-area-population-estimates/mid-2013>

⁷⁰ <http://www.nrscotland.gov.uk/statistics-and-data/statistics/statistics-by-theme/population/population-estimates/special-area-population-estimates/settlements-and-localities/mid-2012>

⁷¹ <http://www.nrscotland.gov.uk/statistics-and-data/statistics/statistics-by-theme/population/population-estimates/estimates-of-special-populations/population-estimates-for-scottish-centenarians/2003-to-2013>

⁷² <http://www.nrscotland.gov.uk/statistics-and-data/statistics/statistics-by-theme/population/population-projections/population-projections-scotland/2012-based>

⁷³ <http://www.nrscotland.gov.uk/statistics-and-data/statistics/statistics-by-theme/population/population-projections/sub-national-population-projections/2012-based>

⁷⁴ <http://www.nrscotland.gov.uk/statistics-and-data/statistics/statistics-by-theme/population/population-projections/population-projections-for-scotlands-sdp-areas-and-national-parks/2012-based>

Include information about the context and likely uses of the statistics

- A1.5 The commentary in the reports frequently adds context to the statistics, with some useful explanations about why the population may be higher or lower in certain areas or in certain years, adding value to the statistics by explaining what they show and why. For example, *Mid-2014 Population Estimates Scotland* explains the main reasons for the changing age structure and why Scotland's population is likely to age in the future, and *Mid-2013 Small Area Population Estimates Scotland* explains why the largest data zones (by population) tend to be where there has been recent house building, or where there are communal establishments. However, section three of *Mid-2013 Small Area Population Estimates Scotland*, which is on data zone population change, is possibly too detailed, quoting lots of numbers, making it difficult to interpret the text.
- A1.6 *Mid-2013 Small Area Population Estimates Scotland* and *Mid-2012 Population Estimates for Settlements and Localities in Scotland* both contain a 'Notes and definitions' section near the end of the report that include simple explanations of some of the more technical terms, including links to more information about them. *Mid-2012 Population Estimates for Settlements and Localities in Scotland* references this section throughout the report but *Mid-2013 Small Area Population Estimates Scotland* does not, and would benefit from doing so.
- A1.7 All the reports contain information about the uses of the statistics, in particular the central government uses. However, (with the exception of *Population Projections for Scotland's Strategic Development Plan Areas and National Parks (2012-based)*) this could be expanded to give more detail, and more information about non-government uses and users of the data.

Include information about the strengths and limitations of the statistics in relation to their potential use

- A1.8 *Mid-2014 Population Estimates Scotland* explains the limitations of the statistics, and in particular the difficulty in producing reliable migration data. It also details the range of improvements that NRS has made to the methodology, including links to more detailed documentation.
- A1.9 Both *Mid-2013 Small Area Population Estimates Scotland* and *Mid-2012 Population Estimates for Settlements and Localities in Scotland* clearly state that the data are not accurate to 'unit level' because 'they are estimates that have gone through various stages of processing' and there are 'limitations with the administrative data sources'. However, the reports do not go on to explain what these limitations are or the impact they may have on the use of the statistics.
- A1.10 *Centenarians in Scotland, 2003 to 2013* highlights the difficulties in producing population estimates for the very elderly and explains the impact that the methodology has on the statistics, which is that each year the estimates for earlier years become more accurate as more death data become available to inform the age profiles. As a result, the current estimate of the number of centenarians in 2013 will differ from the future estimate of centenarians in 2013 to be produced for next year's report.

A1.11 The three projections reports clearly explain the uncertainty and limitations of the projections statistics throughout the reports, highlighting that they are not forecasts of what the government expects to happen based on policy decisions. A separate webpage on uses and limitations of population projections⁷⁵ is linked to from the main population projections webpages.

Be professionally sound

A1.12 All the reports, with the exception of *Centenarians in Scotland, 2003 to 2013*, make good use of maps to add more meaning to the data. For example, figure 2.4 of *Mid-2013 Small Area Population Estimates Scotland*, on the distribution of median ages across Scotland, shows that there are distinct areas where the population tends to be younger or older. This pattern would be difficult to see from tables alone. However, the maps in figure 4.1 of the same report are difficult to interpret due to small font sizes and the use of similar colours used for each of the categories. The maps produced as part of the *Mid-2012 Population Estimates for Settlements and Localities in Scotland* report are available to download in detailed Shape file format, which allows users to map the boundaries for all settlements and localities on a Geographic Information System⁷⁶ (GIS). However, the maps are not available in PDF format, therefore users who do not have a GIS system have to download an ArcReader⁷⁷, which involves registering with ESRI⁷⁸.

A1.13 All the reports include appropriate tables and charts which aid users' understanding of the statistics. The tables and charts are usually clear and well labelled. NRS uses the Scottish statistical geography names in the tables but not the geography codes that accompany the publications.

A1.14 *Mid-2013 Small Area Population Estimates Scotland* and *Mid-2012 Population Estimates for Settlements and Localities in Scotland* both use boxplots to show the distribution of the data. *Mid-2012 Population Estimates for Settlements and Localities in Scotland* includes a useful definition in the 'Definitions' section of the report, explaining what a boxplot is and how to interpret it, and both of the figures that contain boxplots include a link to this definition. *Mid-2013 Small Area Population Estimates Scotland* gives a brief explanation within the text of how to interpret a boxplot. However, it may benefit from using the same definition as is used in *Mid-2012 Population Estimates for Settlements and Localities in Scotland*, which is a more detailed description that users may find easier to understand.

Include, or link to, appropriate metadata

A1.15 All the reports include information about the frequency of release and the next release date, with the exception of *Centenarians in Scotland, 2003 to 2013*, which only includes this information on the webpage for the report, not in the

⁷⁵ <http://www.nrscotland.gov.uk/statistics-and-data/statistics/statistics-by-theme/population/population-projections/uses-and-limitations-of-population-projections>

⁷⁶ See footnote 61

⁷⁷ See footnote 62

⁷⁸ See footnote 63

report itself. The name of the responsible statistician is included in each of the reports.

- A1.16 The reports contain useful links to other relevant NRS data or reports, and *Mid-2013 Small Area Population Estimates Scotland*, *Centenarians in Scotland, 2003 to 2013* and *Projected Population of Scotland (2012-based)* also include links to relevant ONS and NISRA documentation. *Mid-2014 Population Estimates Scotland* only includes a link to ONS and NISRA's home pages but does not contain direct links to the relevant population estimates reports.
- A1.17 None of the reports contain a direct link to the revisions policy. However, this information is contained in the *About this publication* documents, which accompany each of the reports. These documents contain useful information about issues such as data sources, accuracy, and comparability.

Annex 2: Summary of assessment process and users' views

A2.1 This assessment was conducted from July 2014 to July 2015.

A2.2 The Assessment team – Donna Hosie and Pat MacLeod – agreed the scope of and timetable for this assessment with representatives of NRS in September 2014. The Written Evidence for Assessment was provided in October 2014. The Assessment team subsequently met NRS during March 2015 to review compliance with the *Code of Practice*, taking account of the written evidence provided and other relevant sources of evidence.

Summary of users contacted, and issues raised

A2.3 Part of the assessment process involves our consideration of the views of users. We approach some known and potential users of the set of statistics, and we invite comments via an open note on the Authority's website. This process is not a statistical survey, but it enables us to gain some insights about the extent to which the statistics meet users' needs and the extent to which users feel that the producers of those statistics engage with them. We are aware that responses from users may not be representative of wider views, and we take account of this in the way that we prepare Assessment reports.

A2.4 As it was known that some of the users that we planned to approach would have an interest in the range of population estimates and projections we invited comments about all of the sets of statistics covered by Assessment reports 309 to 312 as part of a single user consultation. The Assessment team received 83 responses from the user consultation. It followed-up some of the initial responses with a small number of email, telephone and face to face discussions. The respondents were grouped as follows:

Local authorities	21
Government departments	17
Commercial	9
Government agencies/other public sector	8
NHS	7
Producer organisations (as users)	6
Academics	5
Data suppliers	10

Common Themes

A2.5 A large number of users contributing to the consultation were expert users who were often well connected to the producers and to other users through various networks. Often they used the data, rather than the statistical reports. As a consequence many were not routinely drawing on the published commentary that accompanies the statistics. They had good knowledge of the methods used to produce the estimates and projections and of their strengths and limitations. Some users did call for more documentation of uncertainty, more highlighting of the methodological issues identified, and for clearer documentation of quality.

A2.6 Users expressed a demand for statistics to be available for various different or lower level geographies, although none were requested by more than one or two users. Producers have already met some of these requests either by producing the data at the required level or supporting users to produce their own statistics. A small number of users highlighted differences between the producers in the visual presentation of the statistics, while acknowledging the different resources available to the different producers.

NRS

A2.7 Around half of users of the population estimates and projections that NRS produces who responded to the Authority's user consultation said they were satisfied and had no issues with those statistics. A number of users said they had a close working relationship with NRS and others commented that the statistics team were responsive and helpful. Some users welcomed the introduction of Variant projections.

A2.8 A small number of users in local authorities or commercial organisations would like data at lower levels of geography than were currently provided or for additional geographic areas. At least one user who expressed this was discussing with NRS about how it could meet his particular need. One or two users mentioned access through Scottish Neighbourhood Statistics which was described as cumbersome and not fully up-to-date. However, NRS told us that a new platform is currently being produced that will publish all Scottish official statistics, including the data behind population estimates and projections, in five star open data format.

A2.9 One user said that ONS's statistics are more visual, although another said that, in their opinion, the statistics team would be able to produce more infographics if it had more resources.

Key documents/links provided

Written Evidence for Assessment document

