National Records of Scotland

Mid-Year Population Estimates Scotland: Methodology Guide

Published on 30 April 2020

Contents

1. Introduction to population estimates 3

1.1 Coverage and availability of population estimates 3
1.2 Uses of population estimates 4
1.3 Definition of the population 4
1.4 2021 Census 6
1.5 Other population products 6

2. Methodology for producing population estimates 8

2.1 Introduction 8
2.2 Summary of recent improvements 9
2.3 Summary of the cohort component method 10
2.4 Rounding 10
2.5 Quality assuring the data 10
2.6 The order of production 11
2.7 Overview of the method 11
2.8 Births 12
2.9 Deaths 13
2.10 Migration 13
2.11 Armed forces 13
2.12 Prisoners 14
2.13 Procedures during census years 14

3. Detail on the methodology for estimating migration 15

3.1 Internal migration within the UK 15
3.2 International migration 16
3.3 Distribution of international migrants to and from Scotland 17
3.4 Asylum seekers 19
3.5 Refugees 19
3.6 Additional migration data 20

4. Future developments 21
5. Notes on statistical publications 22

1. Introduction to population estimates

This paper describes the current methodology used by National Records of Scotland (NRS) to produce the annual mid-year population estimates, with reference to the mid-2019 population estimates based on the 2011 Census.

The most authoritative population estimates come from the census, which takes place every 10 years, the most recent being held in March 2011. Population estimates from the census are updated each year with elements of population change in the previous 12 months to produce the annual mid-year estimates. These are considered the official estimates of the Scottish population.

Coverage and availability of population estimates

Coverage

The latest Population Estimates can be found on the NRS website. The available estimates are split under three sections:

1. **Mid-year population estimates**

   The latest annual mid-year population estimates for Scotland and its constituent NHS Board and council areas. This section also includes historical data back to 1981 and a time series dataset back to 1855.

2. **Special area population estimates**

   This section contains the Small Area Population Estimates and estimates for Settlements and Localities. Population estimates for Scottish Parliamentary Constituencies, Westminster Parliamentary Constituencies, Nomenclature of Units for Territorial Statistics (NUTS), Scottish Index of Multiple Deprivation deciles (SIMD) and Urban/Rural classification categories can also be found here.

3. **Estimates of special populations**

   Estimates of the population split by country of birth, nationality and estimates of the very old (including centenarians) are available here.

   Following consultation with users, estimates of population by marital status are no longer produced.

Availability

Population estimates for Scotland, council and NHS Board areas for a particular mid-year (as at 30 June) normally become available around 10 months after the reference date. These estimates are followed by:

- Small Area Population Estimates (SAPE) at data zone level.
- Estimates of Special Populations: Mid-year population estimates for those aged 90 and over by sex, age and council area.

- Estimates of Special Populations: Population by Country of Birth and Nationality.
- Population for Special Areas: Population Estimates for Settlements and Localities in Scotland.

Published estimates split by sex for all ages are rounded to the nearest 10 at council area level to avoid implying spurious accuracy and for ease of aggregation.

Data sets may be downloaded free of charge in Portable Document Format (PDF), Excel or Comma Separated Value (CSV) format. Other data not published on the web are available on request, for example historic estimates[1].

Uses of population estimates

Mid-year population estimates currently have a wide variety of uses within central government, as well as being used by local authorities and health bodies, other public bodies, commercial companies and individuals in the private and academic sector.

These uses can be categorised into two broad groups:

- where the absolute numbers are of key importance. This may be in terms of allocating financial resources from central government, planning services or grossing up survey results. Some of the main central government uses are concerned with resource allocation, and
- where the population figures are compared with other figures such as the numbers of births or deaths in the calculation of rates and ratios.

Definition of the population

The population estimates for mid-2002 onwards are based on the 2011 Census and relate to the usually resident population. In simple terms, this means that population estimates are estimates of people where they usually live. The usually resident population does not always coincide with the number of persons to be found in an area at a particular time of the day or year. The daytime populations of cities and the summertime populations of holiday resorts will normally be larger than their usually resident populations.

The population base from the 2011 Census underpins the mid-year population estimates resident base and is defined as follows:

The 2011 Census has been conducted on a resident basis. This means the statistics relate to where people usually live, as opposed to where they are on census night. Students and schoolchildren studying away from home are counted as resident at their term-time address. If a member of the armed forces did not have a permanent or family

Footnote

1) Contact details can be found in Section 5 of this publication.

address at which they are usually resident, they were recorded as usually resident at their base address. As in 1991 and 2001, residents absent from home on census night were required to be included on the census form at their usual/resident address. Wholly absent households were legally required to complete a census form on their return. No information is provided on people present but not usually resident.

For most people, defining where they 'usually' live for the purposes of the census is quite straightforward. However for a minority of people the concept of 'usual residence' is more difficult and it may be difficult to apply a general rule to assign people to where they are 'usually' living. Groups included in this category are:

- students;
- armed forces;
- prisoners;
- seasonal workers;
- contract workers and others who frequently move with their job;
- some people living in communal establishments;
- people sleeping rough;
- foreign students and au pairs;
- people with frequently used second homes in the UK or abroad;
- people who live and work away from a family home for part of the week;
- children who regularly move between a mother and father's home;
- adults who live with a partner for part of the time but maintain a separate residence; and
- any other groups of people with more than one residence.

The usual residence for students and certain members of the armed forces is specifically referred to in the definition of resident population for the 2011 Census given above. For other groups, guidance was provided either on the census form or in the enumerators' instructions.

In general, the definitions used in the 2011 Census are carried through into the population estimates, mainly because the census is used as a base for the population estimates. However, although efforts are made to ensure comparability of definitions in intercensal data and sources used in the population estimates, sometimes it is not possible to obtain data using the same definition as used in the census.

For example, in the International Passenger Survey (IPS), used to estimate international migration, a person is defined as an in-migrant and therefore a resident if they are intending to stay in Scotland for at least 12 months. However in the census, NRS made no specific adjustment for the presence of 6-12 months migrants among the persons counted in the census.

More details on the scale of the difference in population count between the enumeration and main output base in Scotland is given in Paper 9 11(09) of the Population and Migration Statistics Committee (PAMS) meeting held on
21 January 2011 (more details available on the NRS website).

In practice, when compiling a population estimate, a number of data sources have to be used, each with its own definition of usual residence. These differences in definition are becoming increasingly important, and are the subject of constant research within the National Records of Scotland (NRS) and the Office for National Statistics (ONS).

2021 Census

On 27 March 2014 the National Records of Scotland announced that it intends to focus on planning for a census in 2021, which will be primarily online, while offering alternative modes of completion where necessary. It also aims to make best use of technology and administrative data in its design, building on the online approach used successfully in the 2011 Census. This follows on from the aims of the Beyond 2011 programme, which closed following the recommendation. More details are available from the 2021 Census section of the NRS website.

Other population products

National population projections

The Office for National Statistics (ONS) produces national population projections for the UK and on behalf of its constituent countries. The projections by age and sex are normally produced every second year and the assumptions on which they are based are agreed in consultation with the statistical offices of England, Scotland, Wales and Northern Ireland. The primary purpose of the projections is to provide an indication of future population if current trends in fertility, mortality and migration continue into the future. They are used as a common framework for national planning in a number of different fields. Further information is available on the Population Projections section of the ONS website.

Sub-national population projections

Sub-national population projections for areas within Scotland are produced by National Records of Scotland (NRS) and give an indication of future trends in population by age and sex over the next 25 years. They are trend-based projections, which means assumptions for future levels of births, deaths and migration are based on observed levels over the previous five years. They show what the population will be if recent trends in these continue and also show variant projections based on a range of plausible scenarios such as high migration, low fertility. The projections do not take into account any future changes that may occur as a result of policy initiatives, social or economic change. They are constrained at a national level by the national projections produced by ONS. Further information and data on sub-national projections is available on the NRS website.

Migration statistics

National Records of Scotland produce mid-year to mid-year estimates of migration within Scotland, between Scotland and England, Wales and Northern Ireland and between Scotland and overseas. More information is available in the Migration section of the NRS website.

Household estimates and projections

National Records of Scotland produces estimates and projections of the numbers of households in Scotland. The household projections are based on the population projections and observed trends in household size. The latest household estimates and household projections can be found in the Households section of the NRS website.

Other outputs

National Records of Scotland also produces a range of other outputs and more information can be found in the Statistics section of the NRS website.

2. Methodology for producing population estimates

Introduction

Population estimates for Scotland and its council and NHS Board areas are made using the cohort component method. This is a standard demographic method and is used by several other national statistics institutions that also have access to high quality data sources for the components of population change**.**

For example, this method is used by the Office for National Statistics (ONS), Northern Ireland Statistics Agency (NISRA), the Australian Bureau of Statistics and by the US Bureau of the Census.

Mid-year population estimates are made for the population resident on 30 June of the reference year. The starting point for the estimates is the resident population on 30 June in the previous year.

This population, by single year of age, is then aged on by one year (for example all three-year-olds become four-year-olds one year later). Those who have been born during the 12 month period prior to the mid-year point are then added on to the population and all those who have died during the 12 month period are removed according to their age, sex, and their usual place of residence.

The other factor to be taken into account in estimating the national population is the movement of people in and out of Scotland from the rest of the UK and from overseas (international migration). Internal migration includes both cross-border moves between the four constituent countries of the UK, which affect the total Scottish Population, and moves between local areas within Scotland. Movements of people within Scotland, including changes in special populations (such as the Armed Forces and Prison Population) contribute to population change at council and NHS Board area level.

Migration is the most difficult part of the population estimate process to estimate precisely, as migratory moves are not registered in the UK, either at the national or local level. The best proxy data available on a nationally consistent basis are used to estimate migration. National Records of Scotland (NRS), with Office for National Statistics (ONS), is continually researching ways of ensuring and improving the quality of the population estimates. This research includes analysis of possible new data sources that may become available.

Summary of recent improvements

The table below provides a summary of recent method improvements that have been made to the method for producing the mid-year population estimates. More details are provided on each improvement in the relevant section after the table.

Year change was implemented	Details
Mid-2019	On 1 April 2019, a boundary review between Glasgow City and North Lanarkshire council areas came into effect. As a result, eight postcodes were transferred from Glasgow City to North Lanarkshire. Residents of these postcodes were included in the internal migration estimates between Glasgow City and North Lanarkshire, hence the migration estimates will include approximately 400 additional moves. The same process has been applied to Greater Glasgow and Clyde and Lanarkshire health board areas, which were also affected by the boundary review.
Mid-2017	Method for including refugees updated, using Home Office data on refugees by age, sex and location. Age-sex distribution method for overseas migrants, introduced in 2011, updated. Direct Armed Forces admin data is used for the first time.
Mid-2016	Refugees included in the migration estimates for the first time. The lag assumed for registering with a GP for estimating migration using the Community Health Index (CHI) was made consistent with the two month lag assumed using the National Health Service Central Register (NHSCR). Previously a three month lag was assumed using the CHI.
Mid-2015	An improvement was made to the estimates for internal migration within the UK. This change in method affected internal migration within Scotland and flows between Scotland and the rest of the UK.
Mid-2011	A sex-ratio adjustment has been introduced since 2011 which increases the number of male migrants at young adult ages where there is a large majority of women seen in the NHSCR data.

Summary of the cohort component method

The cohort component method can be summarised as follows:

- Take the previous mid-year resident population and age-on by one year.
- Then estimate the population change between 1 July and 30 June by:
- adding births occurring during the year;
- removing deaths occurring during the year;
- allowing for migration to and from the area.

Adjustments are also made for some special population groups that are not captured by the internal or international migration estimates: members of the armed forces and prisoners. These populations have specific age structures, which remain fairly constant over time. Therefore these groups are not aged-on with the rest of the population. Such populations are referred to as ‘static populations’.

Rounding

At the end of the process for producing the estimates, the total number of people are rounded to the nearest 100 at Scotland level. The council level estimates are then rounded to the nearest 10.

During the process, the international migration estimates that are received from ONS and are rounded to the nearest 100 for both in and out flows. Data regarding asylum seekers and refugees are rounded separately from other international migrants to the nearest 100 for each flow.

Quality assuring the data

When the Population and Migration Statistics team within NRS receives data for the various components, checks are carried out and comparisons made with previous years’ data to gauge consistency and completeness of coverage. The data are then processed electronically to produce the mid-year estimates. Quality assurance takes place at each stage of this process. This may include calculation of demographic rates and ratios to help check the plausibility of the data.

NRS also have processes in place to check the suitability of the administrative sources used in producing population estimates. A report is available on the NRS website providing information on the quality assurance arrangements for administrative data used in population estimates, along with information on the suitability of each data source used in the production of the population estimates.

The order of production

Population estimates for Scotland, council and NHS Board areas are produced first. Estimates for small areas (2011 Data Zones) are produced in the same way and constrained to the council area estimates (following the 2011 Census the data zone boundaries have been redrawn following user consultation. Both 2001 and 2011 Data Zones were designed to nest into council areas although for the 2001 Data Zones small boundary changes since 2001 mean their borders may no longer align precisely). Since August 2015, the 2011 Data Zone population estimates are aggregated to various geographies for example urban and rural populations or feed into the calculation of settlement and locality population estimates on a 'best-fit' basis. Prior to this date the various geographies were aggregated from 2001 Data Zones.

Information on how data zone population estimates are produced can be found in Small Area Population Estimates - Background and Methodology on the NRS website.

Information on populations calculated by aggregated 2001 and 2011 Data Zones to various geographies on a 'best fit' basis can be found in the Evaluation of Non Standard Geography Population Estimates section of the NRS website.

Overview of the method

The following figure shows how the population estimates for Scotland and its council and NHS Board areas are produced. All these processes are carried out by single year of age and sex up to age 89. Those aged 90 and over are processed as a single group.

The first main stage is the ageing on by one year of the previous year's resident population. Before ageing on can be carried out however, all armed forces stationed in Scotland and detained prisoners in the previous year are removed from the resident population

Following ageing on, the main components of change – births, deaths and net migration are applied. Both migration to and from England & Wales, Northern Ireland and migration to and from the rest of the world must be taken into account. The Prison and Armed Forces populations for the new reference date are then added and a small adjustment is made for changes in the prison population and moves to and from the armed forces. Having applied these components, and rounded the resulting estimates, the final result is the population for Scotland, its council areas and NHS Board areas split by sex and single year of age to 89 then the 90+.

The previous year's population

−

The previous year's armed forces stationed in Scotland

−

The previous year's prison population

⟶

Age-on the population by one year

+

Births

−

Deaths

+

Net migration*

+/-

Net moves into and out of the Armed Forces**

+

The current year's armed forces stationed in Scotland

+

The current year's prison population

+/-

An adjustment for changes in prison population

=

Estimated population for current year

* Net migration includes in-migrants and out-migrants from England & Wales, Northern Ireland and overseas, including estimates of asylum seekers. For Council and NHS Board areas this also includes moves within Scotland.

**Movements to and from the armed forces (including dependents) are processed with, and previously were included under, net migration.

Births

Data on births are obtained from the compulsory civil registration system administered by National Records of Scotland and the Local Registration Offices. The Population and Migration Statistics team is supplied with data on live births by sex for the period from 1 July of the previous year to 30 June of the current year. Because registration of a birth may legally take place up to 21 days after the birth, the data received refer to the date of birth rather than the date of registration. Births are added to the population at age zero and are allocated to the area of usual residence of the mother.

Deaths

As for births, data for deaths are obtained from the compulsory civil registration system. The Population and Migration Statistics team is supplied with data on deaths by age and sex for the period from 1 July of the previous year to 30 June of the current year. Data refer to the date of death rather than the date that the death was registered. Deaths are subtracted from the mid-year population by age and sex at the area of usual residence of the deceased. In order for this to work correctly, the age at death is calculated to be the age that the deceased person would have been on
30 June. (This age calculation is carried out by the NRS Vital Events team.) No adjustments are made for non-resident deaths.

Migration

Migration is the most difficult component of population change to estimate, as there is no comprehensive system which registers migration in the UK, either moves to or from the rest of the world, or moves within the UK. Estimates of migration have therefore to be based on survey data and the best proxy data that exist.

Migration estimates are derived from three key sources of data:

- National Health Service Central Register (NHSCR);
- Community Health Index (CHI); and
- International Passenger Survey (IPS).

The NHSCR is used to calculate moves between NHS Board areas within the UK, with migration at council area and below estimated using anonymised data from the CHI. The IPS provides information on overseas moves into and out of Scotland, and on asylum seekers. These three main sources are described in more detail in the remainder of this section.

Armed forces

The Armed Forces population used in the mid-year estimates is based on armed forces personnel recorded in the census, which captures a larger armed forces population than administrative sources.

Census estimates for local areas were adjusted to take into account differences in where armed forces personnel were instructed to complete their census forms and our standard definition of ‘usual residence’.

To update the population each year, administrative data from Defence Statistics (part of the Ministry of Defence) are used to estimate numbers residing in each council and NHS Board area.

Until mid-2016 the age-sex distribution was based on data from the 2011 Census. However, from mid-2017 data by single year of age and sex is now sent to NRS by Defence Statistics.

Changes in the armed forces populations from the previous year's Defence Statistics data are calculated by single year of age and sex for each council area. The changes are then applied to the armed forces data derived from the census. This is done rather than using the new data from Defence Statistics directly due to the differences between the armed forces captured by the census and administrative estimates.

Prisoners

Information on those sentenced to six months or more at 30 June by age, sex and establishment is obtained from the Scottish Government prison statistics. This group of prisoners are considered to be 'usually resident' in the area where the prison is located. Prisoners with shorter sentences are assumed to be 'usually resident' at their home address.

At the beginning of the mid-year processing the prison population of the previous year is removed from the previous year's population. After ageing on the general population and adjusting for births, deaths and migration the prison population for the current year is added to the population.

Following this, an adjustment has been introduced from 2011 to account for any changes in the prison population. The rebased mid-year population estimates from 2002 to 2010 also contain this adjustment. For example, if the prison population increased by 200 people in the year, the national population would be adjusted downwards by the same amount. This prevents double counting of prisoners and prevents an increase in the national population, which would otherwise result from any increase in the prison population.

Procedures during census years

The method above describes how mid-year population estimates are calculated for years when there is no census. For census years such as 2011, a slightly different approach is necessary. The starting point for the base population is that estimated by the census. In 2011 this was as at 27 March. Rather than ageing on the population by one year, the population only needed to be aged on by the period of time between the census and 30 June (three months in 2011) which is calculated using dates of birth provided on the census. Similarly, the components only needed to account for change during this period rather than a whole year.

In 2011 an adjustment was made to the initial census base population used for the mid-year estimates. This was to account for differences in where armed forces personnel were instructed to complete their census forms and our standard definition of 'usual residence'. The adjustment largely increased numbers in areas with barracks and correspondingly decreased numbers elsewhere in the country compared with the census population. The mid-2011 population assumed no changes in the total number of personnel between 27 March and 30 June.

3. Detail on the methodology for estimating migration

Internal migration within the UK

The NHSCR system records the movements of patients between NHS Board areas in Scotland, whereas the movements for patients in England and Wales are recorded in the Personal Demographic Service (PDS). The PDS holds the master demographics database for the NHS in England and Wales. Each time a patient transfers to a new NHS doctor in a different NHS Board area, the NHSCR and PDS are notified and then the patient is considered to have made a migrant move. Counts of these re-registrations are used as a proxy indicator for moves between Scotland and the rest of the UK.

The CHI holds records of people registered with an NHS doctor in Scotland. Unlike the NHSCR, these records contain the postcode of the patient's address. Postcode data is shared by NHS National Services Scotland (NSS) with NRS NHSCR. Under the agreement NHSCR staff holds copies of the CHI Postcode alongside the actual NHSCR which they may use in a limited way, for example to help trace patients for NHS Health Board postings. Counts of new postcode records from the anonymised NHSCR and linked CHI postcode extract are used as a proxy indicator for moves within Scotland at NHS Board area level.

Further to this, NRS also receive a separate annual snapshot of CHI data including postcode as well as other data not linked to NHSCR directly from NHS NSS, which enables migration to be estimated for council areas, and for smaller areas. The approach used for estimating council area migration involves matching CHI patient records extracted from a database which reflects the ‘live’ CHI system on two occasions one year apart.

Previously, the two extracts from the ‘live’ CHI system that were used to estimate migration were at 30 September each year (e.g. for the mid-2015 estimate CHI extracts from 30 September 2014 and 30 September 2015 were used). However, for the mid-2016 population estimates onwards the method has been improved by using CHI extracts at 31 August (31 August 2015 and 31 August 2016).

Using the September CHI extracts, the lag that was assumed for a person registering with a General Practitioner (GP) following a move was three months. People who registered with a GP up to 30 September were counted as moving in the year to 30 June. For example, council area migration for the mid-2015 estimate was based on GP registrations that occurred from 1 August 2014 to 30 September 2015. However, the lag was changed to two months from the mid-2016 estimates onwards, with the change to August CHI extracts and is now consistent with the lag that is assumed for the NHSCR for health board level moves.

Due to an improvement in data sources, the accuracy of cross border migration data between Scotland and Northern Ireland was improved in 2009. More information on the nature of the improvements is contained in the papers from the May 2010 meeting of the Population and Migration Statistics Committee (PAMS), available on the NRS website. We are continuing to review the process for estimating internal migration, including investigating the use of patients’ postcode information held on the NHSCR. More information on the progress of this work can be found in papers of the Population and Migration Statistics Committee (PAMS).

From mid-2015 onwards an improved method for estimating internal migration within the UK has been introduced. A direct extract of anonymised records from the NHS Central Register (NHSCR) to calculate the migration at a health board level is now used. This improvement, the first stage of further planned improvements, has been accelerated due to the implementation of the April 2014 NHS Board area boundary changes on the NHSCR system. Internal migration information for the 2014 mid-year population estimates was not affected by changes in Board area boundaries and the methodology used for mid-2014 and years prior to mid-2014 is detailed in the Mid-Year Population Estimates for Scotland: Methodology Guide 2014 on the NRS website. Information about the impact of the boundary changes compared with our previous migration data source is contained in Annex A of Paper 4 PAMS (14) 16 from the November 2014 meeting of the Population and Migration Statistics Committee (PAMS). The improvements made to the methodology, the data source from NHSCR and the impacts of these changes are detailed in Paper 10 PAMS (15) 10 from the May 2015 meeting of the Population and Migration Statistics Committee (PAMS), available on the NRS website.

Until 2016 NHS patient movements in England and Wales were recorded in the NHSCR, however this system was switched off in February 2016. Since that time the PDS holds the master demographic database for the NHS England and Wales. The PDS data is supplied to ONS and postcode changes are seen as representing moves of address. More information is available in the Methodology Guide for the Mid-2016 Estimates on the ONS website.

Unlike the NHSCR data provided previously, the PDS file contains administrative/system changes as well as actual moves. There is currently no variable available that distinguishes between actual moves and system updates. Also the PDS updates file for 2017 contains moves that occurred in previous years. In order to produce plausible cross border flows for 2017, it was necessary to make assumptions about which records to extract from the PDS that made it more consistent with the data extracted from the NHSCR previously. The main assumptions were:

- For records matching on key variables only the latest record was kept.
- The 2017 PDS updates file was merged with the 2016 PDS stocks file, the assumption being that if an individual has already moved from Scotland to England and Wales by 30 June 2016 (according to the 2016 stocks file) then we do not consider they have moved again in 2017 if the posting effective date and other key variables have not changed.

International migration

An international migrant is defined by the United Nations as someone who changes country of residence for 12 months or more. There is no single, all inclusive system in place to measure all movements of people into and out of the UK or to determine if they meet the definition of a long-term migrant. Therefore, it is necessary to use a combination of data from different sources that have different characteristics and attributes in order to produce estimates of international migration. While offering the best data currently available, none of the data sources used are specifically designed to capture information solely on international migration.

National Records of Scotland currently use the Long-Term International Migration (LTIM) estimates produced by the Office for National Statistics (ONS) for the national estimates of international migration to and from Scotland. These are the best estimates of the moves to and from the UK that meet the definition of long term migration.

Three sources of data are used by ONS to compile the LTIM estimates:

- International Passenger Survey (IPS);
- Information held by the Home Office; and
- Labour Force Survey (LFS).

The IPS is a continuous sample survey conducted by the Office for National Statistics (ONS) at the principal air, sea and Channel Tunnel routes between the UK and countries outside the British Isles. It is the prime source of migration data to and from the UK, providing estimates of both inflows and outflows, but does not cover all migration types. The Home Office provides data on refugees and on asylum seekers and their dependants, and the LFS, collects information on where international migrants live based on their recorded work address.

Over time changes have been made to the IPS sample design, to make the survey more focused on identifying migrants. These changes included a re-organisation of the times and frequency of sampling of travellers, sampling at additional locations which means that the IPS now includes Edinburgh, Glasgow and Aberdeen airports, and improvements to the IPS weighting methodology.

Given that the IPS collects information on the intentions of potential migrants, which may or may not be realised, an adjustment is made to the IPS data for visitor switchers (people who say they are staying for less than 12 months but in fact stay more) and migrant switchers (people who say they are staying for longer than 12 months but in fact stay for less).

The IPS provides an estimate of international migrants into the United Kingdom. The allocation of these migrants to Scotland is based on the LFS. The LFS provides more reliable data on the geographical distribution of immigrants than the destination provided in the IPS as it is based on where migrants actually live rather than on their initial intentions. The outflow of international migrants from Scotland is based directly on the IPS data.

More information on the Long-Term International Migration (LTIM) method including the quality of the IPS can be found in the International Migration Methodology section of the ONS website.

Distribution of international migrants to and from Scotland

International migration flows between Scotland and overseas are allocated to each NHS Board area and given an assumed age and sex distribution using proportions recorded on the NHS Central Register (NHSCR). These proportions are applied to the total Long-Term International Migration (LTIM) flows for Scotland.

For inflows the recorded moves from overseas to Scottish NHS Board areas on the NHSCR are used to estimate the proportion of migrants entering each area.

NHSCR records hold limited data on international outflows from NHS Board areas to overseas, as patients do not reliably de-register with their doctor when moving overseas. As a result of this various methods have been used to approximate the geographic distribution of out-migrants since 2001. We recently reviewed the current method and found that it still provides the best approach for estimating the age and sex distribution of international outflows from each NHS Board area given data sources available.

International outflows are allocated to NHS Board areas based on:

- international inflows from two years prior to the reference date;
- outflows to the rest of the UK; and
- the population share of each NHS Board area.

These proportions are averaged but with international inflows weighted twice. The international inflows stand as a proxy for non-British out-migrants (e.g. 'returning home') while the moves to the rest of the UK and population share stand as a proxy for British out-migrants.

Age and sex distributions of international migrants are obtained from the NHSCR in a similar way, and calculated separately for each NHS Board area.

For in-migrants the age-sex distribution of moves from overseas to that NHS Board area on the NHSCR is used. For international out-migrants the age-sex distribution is based on:

- out-migrants to the rest of the UK leaving from that NHS Board area; and
- in-migrants from overseas two years prior to the reference date, aged on by two years.

At NHS Board area level the weighting of the two distributions depends on the level of in-migration from overseas that takes place in that area. Areas with a high level of in-migration from overseas are assumed to also have out-migrants who reflect the characteristics of this group (e.g. 'returning home').

It is acknowledged that NHSCR flows undercount the number of migratory moves for young men in particular, due to General Practitioner (GP) registration behaviour in different groups. Compared with LTIM estimates by sex there are fewer men in both the in and out-migrant groups recorded on the NHSCR. A sex-ratio adjustment has been introduced from 2011 which increases the number of male migrants at young adult ages where there is a large majority of women seen in the NHSCR data.

More information on how the methodology has been changed is available in the papers from the April 2013 meeting of the Population and Migration Statistics Committee (PAMS) on the NRS website.

This method has been improved for the mid-2017 estimates, by including data from the International Passenger Survey aggregated from mid-2010 onwards to determine the size of the sex-ratio adjustment. NHSCR data from mid-2010 onwards has also been included to determine which ages to apply the adjustment to for each NHS Board area.

The distribution of migrants to council areas is based on records from the Community Health Index (CHI), which are then made consistent with the NHSCR geographic and age/sex distributions at NHS Board area level. International in-migrants were allocated using records appearing on the CHI extract where the patient had arrived from overseas. Like the NHSCR, the CHI extract holds limited data on people leaving Scotland for overseas and so international out-migrants were allocated using a combination of in-migrants to Scotland from overseas and migrants leaving Scotland for the rest of the UK.

More information on how the CHI extract is used in the mid-year estimates process and more detail of the methodology is available in the meetings papers PAMS (03) 10 – Improving the GROS migration data for council areas – proposals for 2002 and Supplement to PAMS (03)10 – Validation of Proposed Methodology both of which can be found within the PAMS meeting 3 April 2003 which is available on the NRS website.

Asylum seekers

Both inward and outward asylum seekers are included in the LTIM estimate (outward asylum seekers are people who arrive looking for asylum but for one reason or another don't stay). Most of these asylum seekers are assumed to be supported by the National Asylum Support Service (NASS). This means that they are entering the UK through a Home Office application and are provided with support such as subsistence costs or help with accommodation by NASS while their application is underway.

Currently the vast majority of NASS supported asylum seekers in Scotland are supported in Glasgow City Council and so it is assumed that the majority of asylum seekers entering Scotland migrate to Glasgow City Council. The NASS supported asylum seekers are not included in the control totals when distributing international migrants around Scotland.

A small number of non-NASS supported asylum seekers may be present elsewhere in Scotland. No specific adjustments are made for this group.

The age/sex distribution of in-migrating and out-migrating asylum seekers is derived from the UK level distribution provided by the Office for National Statistics and information from the Home Office.

Refugees

Since the mid-2016 population estimates, refugees resettled under Home Office Resettlement Schemes have been included. For the mid-2017 estimates, refugees are now accounted for in a similar way to asylum seekers. They are also included in the LTIM estimate, although only for inward refugees. Refugees are, however, distributed much more widely across Scotland than asylum seekers.

NRS receives Home Office administrative data on the age, sex and council area of refugees supported under the Syrian Vulnerable Persons Relocation Scheme (SVPRS). SVPRS refugees make up the majority of refugees resettled in Scotland. This data is used to distribute SVPRS refugees by single year of age and sex to council areas.

Data is also received on non-SVPRS refugees by age and sex at UK level. It is assumed that Scotland receives the same share of non-SVPRS refugees as SVPRS refugees. This share is then used to select a random sample of the non-SVPRS refugees by single year of age and sex. The distribution of SVPRS refugees to council areas in Scotland is then used to distribute this sample to council areas across Scotland. Council areas thus receive the same proportion of SVPRS and non-SVPRS refugees.

Additional migration data

The NRS website includes a Migration section which provides additional tables showing migration estimates associated with mid-year population estimates as well as Local Area Migration Reports which draw together a range of sources of data on migration to enable analysis of migration at local area level.

4. Future developments

The methodology used in the mid-year estimates is ever-evolving and as more administrative data sources become available to NRS and as the accuracy of data increases, inevitably, changes to the methodology will result. This section outlines several new sources of data that NRS are pursuing access to and also highlights areas in the current methodology that NRS are working towards improving.

Improving the use of the NHSCR

NRS are continuing to review the process for estimating migration flows within Scotland and from the rest of the UK using a direct extract of anonymised records from the NHS Central Register (NHSCR). This should result in more accurate migration data at council and small area level.

Transformation programme

NRS are part of a cross-government programme of work being led by the Office for National Statistics to transform population and migration statistics through greater use of administrative data.

One of the objectives of the Scotland's Census 2021 Programme is to make recommendations for future censuses. In order to feed in to this recommendation, a project to create Administrative Data Population and Household Estimates was commissioned. The aim of this project is to look at the future use of administrative data collected by public bodies and services to augment or replace NRS' data collected by a traditional census.

NRS are working in creating an admin-based population outputs from various sets of administrative data. This project has been in development since 2017, and hopefully this year, the first set of administrative based population estimates will be published for 2016.

This information will be published as experimental statistics under the Code of Practise for Official Statistics. To allow a discussion with users about the use of administrative data within the field of demographic statistics. As this area of statistics develops, information will be updated to the following webpage:
https://www.scotlandscensus.gov.uk/administrative-data

If you have an interest in attending any future stakeholder events were administrative data is being discussed, please contact: Scotlandscensus@nrscotland.gov.uk

New sources of data

NRS are exploring the feasibility of using data from the Higher Education Statistics Agency (HESA) to improve estimates of student migration.

5. Notes on statistical publications

National Statistics

The United Kingdom Statistics Authority (UKSA) has designated these statistics as National Statistics, in line with the Statistics and Registration Service Act 2007 and signifying compliance with the Code of Practice for Official Statistics (available on the UKSA website).

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 National Records of Scotland's responsibility to maintain compliance with the standards expected of National Statistics. If we become concerned about whether these statistics are still meeting the appropriate standards, we will discuss any 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.

Information on background and source data

Further details on data source(s), timeframe of data and timeliness, continuity of data, accuracy, and more can be found in the About this Publication document that is published alongside this publication on the NRS website.

National Records of Scotland

We, the National Records of Scotland, are a non-ministerial department of the devolved Scottish Administration. Our aim is to provide relevant and reliable information, analysis and advice that meet the needs of government, business and the people of Scotland. We do this as follows:

Preserving the past – We look after Scotland's national archives so that they are available for current and future generations, and we make available important information for family history.

Recording the present – At our network of local offices, we register births, marriages, civil partnerships, deaths, divorces and adoptions in Scotland.

Informing the future – We are responsible for the Census of Population in Scotland which we use, with other sources of information, to produce statistics on the population and households.

You can get other detailed statistics that we have produced from the Statistics section of our website. Scottish Census statistics are available on the Scotland's Census website.

We also provide information about future publications on our website. If you would like us to tell you about future statistical publications, you can register your interest on the Scottish Government ScotStat website.

You can also follow us on twitter @NatRecordsScot

Enquiries and suggestions

Please contact our Statistics Customer Services if you need any further information.

Email: statisticscustomerservices@nrscotland.gov.uk

If you have comments or suggestions that would help us improve our standards of service, please contact:

Alan Ferrier

Senior Statistician

National Records of Scotland

Phone: 0131 314 4530

Email: alan.ferrier@nrscotland.gov.uk