

Northern Ireland internal migration and Northern Ireland Medical Card information: quality assurance of administrative data used in population statistics, Feb 2017

The quality assurance undertaken on administrative data for Northern Ireland internal migration and Northern Ireland Medical Card data used within Population Statistics Division (PSD) publications.

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1 . Introduction

Population statistics are a devolved matter, with National Records of Scotland (NRS) producing statistics for Scotland, the Northern Ireland Statistics and Research Agency (NISRA) producing statistics for Northern Ireland and the Office for National Statistics (ONS) producing statistics for England and Wales. We are also responsible for production of UK statistics.

NISRA produces internal migration statistics for Northern Ireland, which feed in to the UK population estimates and national population projections that we produce. These statistics are based on Northern Ireland registrations for Primary Health Care Services, including new registrations. The General Practitioner (GP) registration data are collected and managed by Business Services Organisation (BSO). We also use Northern Ireland GP registration information as a direct administrative data source in the calculation of cross-border migration within the UK.

This report covers the processes, from data collection through to publication, for publications produced by Population Statistics Division (PSD) of ONS, which use Northern Ireland internal migration or make direct use of Northern Ireland GP registration data as an administrative data source. It identifies potential risks in data quality and accuracy as well as details of how those risks are mitigated.

This report is intended to supplement existing documentation:

- ONS [Methodology Guide for Mid-2015 UK Population Estimates \(England and Wales\), June 2016](#).
- [annual Mid-Year Population Estimates QMI](#)
- [consistency of methods used for population statistics across UK countries](#)
- [ONS internal migration methodology](#)
- [National Population Projections methodology](#)

This report has been published to help you understand data processing and provide reassurance that the subsequent statistics produced by PSD using Northern Ireland internal migration and GP registration data are suitably robust.

PSD's Population Estimates Unit (PEU) uses Northern Ireland internal migration estimates in mid-year population estimates as a component of population change for Northern Ireland.

PSD's Population Projections Unit (PPU) uses Northern Ireland internal migration data in the production of national population projections (NPP) to measure cross-border flows within the UK.

PSD's Internal Migration Unit (IMU) uses the Northern Ireland GP registration data as the basis for which to measure the cross-border flows where people move to Northern Ireland: the receiving country is deemed to be the best-placed country to decide on the population flow between UK countries.

Within PSD, Northern Ireland internal migration and GP registration data were assessed separately, by relevant teams, using [the UK Statistics Authority's Quality Assurance of Administrative Data Toolkit](#). The toolkit can be used to assess an administrative data source in terms of the risk to data quality and its onward use in statistics, including the profile of the statistics produced from the source. The results of those assessments are that the data received an A1 rating.

The A1 rating means that a basic level of assurance is required for these sources and this report will provide information to meet this level of assurance. If you feel that this report does not adequately provide this assurance then please contact with your concerns.

Summary of quality assurance level for Northern Ireland internal migration and Northern Ireland Medical Card information

Use	Risk of quality concern	Public interest	Assurance Level
Overall Assessment		A1 – basic	
PEU	Low	High	A1 – basic
PPU	Low	High	A1 – basic
IMU	Low	Medium	A1 – basic

Source: Office for National Statistics

The rationale behind these scores will be provided, in terms of both the risk and profile components, later in this report.

The toolkit outlines 4 areas for assurance; the rest of this report will be split into these areas. The areas for assurance are:

- operational context and administrative data collection
- communication with data supply partners
- quality assurance principles, standards and checks applied by data suppliers
- producer's quality assurance investigations and documentation

2 . Operational context and administrative data collection

To access General Practitioner (GP) services in Northern Ireland, an individual needs to complete a registration form with the GP practice they wish to register with and have their entitlement assessed by the Business Services Organisation (BSO). There are different processes for assessment depending on where the individual has come from (that is registering from outside UK, within UK or as a brand new registration), however, once their registration has been approved they are entitled to access primary (and secondary) healthcare services and will receive a medical card printed with their GP and personal details. Once an individual is registered for primary care they are able to update their demographic information via their GP or the BSO website and they can change GP by visiting the GP surgery. In order to register for inclusion on a GP practice list of patients, an individual will need to fill in a registration form:

- patients moving from 1 GP to another either within Northern Ireland or from elsewhere in the UK and are UK residents, typically fill in a HS200 form
- patients from outside the UK OR who are originally from outside the UK and may have been living in the UK for a period of time complete a HS22X form, which requires proof of entitlement to services

If a patient has been registered elsewhere in the UK, the previous GP details can be provided by the patient or searched for by BSO staff and their medical records are requested from that health authority (HA). Similarly requests are received from other HAs in the UK for patients who have been registered in Northern Ireland and are now living elsewhere in the UK. This is recorded on the person's registration record held by BSO on the National Health Applications and Infrastructure Services (NHAIS) record and enables England, Wales, Scotland and Isle of Man deductions and additions to be separated. As such, there is a means of verification for the data provided and any discrepancies can be raised with the patient when they next visit the surgery or if they are contacted about their application.

Northern Ireland internal migration estimates are produced primarily using GP registration data. NHAIS is managed by the Health and Social Care Business Services and is a register of all persons currently or previously registered for primary care health services in Northern Ireland.

Data are extracted from NHAIS, which is a live system that links to every GP practice in Northern Ireland and receives updates of all new registrations, changes in demographic details and deductions of people registered for primary care in Northern Ireland. Extracts are taken every 3 months primarily to facilitate payment to GP practices for provision of primary care services.

The provision of statistics and datasets is managed by the Information Unit, a team within BSO's Family Practitioner Services directorate. The Information Unit comprises a mixture of statistical staff on secondment from NISRA and IT staff from BSO.

BSO validates the data and ensures that it is fit for purpose; they also add geo-location information to some records. Data are then geo-referenced by NISRA staff working in BSO, before the data are sent to the Population Statistics Team in NISRA. Records relating to cross-border flows are collated by BSO and are sent direct to the Internal Migration Unit within ONS. The Population Statistics Team makes adjustments for known deficiencies and creates the Northern Ireland internal migration estimates, which are sent to Population Estimates Unit in ONS.

The transfer of this data is governed by a number of pieces of legislation.

3 . Communication with data supply partners

Business Services Organisation (BSO) supplies Internal Migration Unit (IMU) with a table of data covering cross-border flows via email on a quarterly basis. This is a longstanding agreement and is part of BSO's business as usual processes. In each supply of data the latest contact details are supplied so that should there be an issue there is a means of resolution.

The Northern Ireland internal migration estimates are created by Northern Ireland Statistics and Research Agency (NISRA) using data provided by BSO and are subsequently provided to Population Statistics Division (PSD).

A service level agreement is in place between NISRA and BSO in which BSO agrees to supply NISRA with the following data every quarter:

- unit record data: record level list of all persons on the register for primary care (whether living, dead or gone away)
- counts data: control total counts of additions and exits from the register for primary care

NISRA receive unit record data from BSO every quarter, which is subsequently converted into 2 parts:

- flows data: contain information on moves, arrivals to and departures from Northern Ireland
- stock data: provide information on the numbers of people by age, sex and area

Population Estimates Unit (PEU) request internal migration data each year from NISRA as part of the components of change data for the population mid-year estimates. The data are supplied as aggregated estimates at Northern Ireland local government districts and national levels. NISRA supply PEU with historical components of change alongside the most recently available data.

PEU has no formal agreement with NISRA for the supply of data. Regular contact is maintained between staff in PEU and NISRA. NISRA normally publish their mid-year estimates on the same day as PEU publish mid-year population estimates (MYE). A formal request for data is sent from PEU to NISRA well in advance of the MYE publication date to allow sufficient time to incorporate Northern Ireland migration data and enable timely publication.

Should there be a delay in the supply of data, the 2 organisations will negotiate for the data to be supplied as soon as possible in a bid to minimise disruptions to either party's publication schedule.

Population Projections Unit (PPU) has an agreement with NISRA that NISRA will supply data to meet PPU's requirements for the national population projections. PPU request internal migration data from NISRA for relevant years, prior to the start of processing, to ensure that they have the most up-to-date data possible. Staff in ONS and NISRA engage in regular discussion and in a projection publication year, an initial national population projections (NPP) committee meeting is held in January where ONS will outline their intended progress and provide NISRA with a timetable of events; data requirements are discussed in this meeting and a rough date for NISRA to provide us with Northern Ireland internal migration data is set. A formal data request is sent after this initial meeting. In July of the same year, a second committee meeting takes place during which ONS and NISRA discuss the agreed assumptions for migration.

3.1. User engagement

PSD continually engages with users, through a variety of means, to understand how our outputs are meeting their requirements. Feedback provided tends to relate to the overall statistical methodology and the impact on the final statistics, rather than to any individual data source. To date no specific feedback on the use of this data source has been provided.

4 . Quality assurance principles, standards and checks applied by data suppliers

Business Services Organisation (BSO) reviews the submission of HS200 and HS22X forms to ensure that the data supplied are valid and where appropriate that the data supplied are accurate either against pre-existing medical registration data or against supporting information used in the application for GP registration.

BSO carries out auditing on their administrative data before providing them to Northern Ireland Statistics and Research Agency (NISRA). BSO states that for most of the data extracted from the National Health Applications and Infrastructure Services (NHAIS), the following validation steps are completed:

- checking consistency (over time and between variables) and reliability of the data
- analysis of trends
- checking that values fall within acceptable ranges
- assurance from subject matter experts

Quality assurance is undertaken by the population statistics team within NISRA. A number of data consistency and validation checks are carried out including:

- identification and removal of duplicated records
- identification and imputation of missing data
- clean-up of geographic information
- checks for conflicting records

If issues are discovered during quality assurance, NISRA will communicate with BSO and agree any decisions to the amendments and adjustments the data may require. No changes will be made before an agreement is reached.

There are a number of recognised risks to data quality when using the medical card register to measure internal migration identified by NISRA for which they provide mitigation:

1. There is a recognised deficiency in the number of registrations and de-registrations from young adult males recorded by the GP registration data, to account for this, the age distribution of young adult males is adjusted to be similar to the young female age distribution.
2. There is an assumed lag between the arrival of a person into Northern Ireland and registration with a GP practice. The assumed lag is a period of 3 months. For example, new registrations between October 2015 and September 2016 will be used for official estimates of migrations between July 2015 and June 2016. The same lag is assumed for people leaving Northern Ireland.
3. International emigration from Northern Ireland is estimated from de-registrations of those registered for primary care. The results from previous research have shown that outflows are not fully captured by the de-registration of those registered for primary care, only around 3 in 5 people de-register from their family GP when moving abroad. De-registrations are currently scaled up by 67% as a result to account for this known deficiency.

Detailed quality information regarding the GP registration data is covered in [Population Estimates and Projections for Northern Ireland](#) QAAD report.

For additional information on the NISRA's quality assurance of internal migration data, please see [Administrative Data Quality Document – Population Estimates and Projections for Northern Ireland](#) and [Business Services Organisation, Information and Registration Unit – Statement of Administrative Sources used for statistical purposes](#).

5 . Producer's quality assurance investigations and documentation

The internal migration data we receive are identical to those published by Northern Ireland Statistics and Research Agency (NISRA) as part of their own internal migration estimates. Population Statistics Division's quality assurance procedures are designed to be proportionate and sufficient to protect the quality of derived statistics.

5.1 Population Estimates Unit (PEU)

NISRA supply PEU with historical components of change alongside the most recently available data. The data are supplied as aggregated estimates by Northern Ireland local government districts and at the national level. The data is used by PEU in the production of the mid-year population estimates in the components of change for the UK population and Northern Ireland local government districts.

PEU conduct sense checks on the data, they:

- visually examine the data for any unexplained inconsistencies or missing data
- check that the historical data supplied have not changed since the previous data supply
- check time series to ensure that there are no unexplained and significant differences compared with historical data

Should any issues with the data be identified, PEU will contact NISRA, communicate the finding and investigate the cause of the discrepancy.

5.2 Population Projections Unit (PPU)

PPU use Northern Ireland internal migration data as part of their processes to set Northern Ireland migration assumptions as well as Northern Ireland age and sex distributions for the national population projections. PPU conduct the following sense checks on the data, they:

- check that the data are complete and appear valid
- compare datasets received against previous supplies to ensure consistency
- conduct time series analysis to ensure that there are no unexplainable trends

If these checks yielded any issues then NISRA would be contacted for an explanation and the data would be further scrutinised for potential errors.

Output data are checked for consistency against previous projections, the internal migration component of change is checked against previous national population projections (NPP) outputs to ensure there are no unexplained trends in the projection; should an anomaly be found, a further check will be conducted to identify the cause.

5.3 Internal Migration Unit (IMU)

IMU use Northern Ireland medical card data to estimate the cross-border flows to Northern Ireland from England and Wales as part of their production processes when calculating internal migration estimates.

IMU conduct the following sense checks on the data, they:

- check that the data are complete and appear valid
- conduct time series analysis to ensure that there are no unexplainable trends

If these checks yielded any issues then BSO would be contacted for an explanation.

6 . Conclusion

6.1 Strengths and limitations

The General Practitioner (GP) registration data is considered the most comprehensive source of information that can be used to estimate migration within and to or from Northern Ireland. Although there are weaknesses with the data, any deficiencies are known and are adjusted for in the development of migration estimates.

The main strengths and limitations are:

- the GP registration data are a comprehensive source of information that can be used to estimate migration within and to or from Northern Ireland
- unit record data are available, enabling analysis at the small area level
- it is recognised that the GP registration data are deficient in recording young adult males; however, within population statistics, the age distribution of young adult males is adjusted to be similar to the young adult female age distribution
- the GP registration data are subject to list inflation of approximately 5%
- differences exist between active and total registrations for primary care services; for example, the lower use of health services by young males is widely acknowledged making the number of active registrations an overly conservative estimate of the population
- not all outflows are measured fully by the GP registration data; as a result, population statistics scale up deregistration by an additional 67% (that is, 3 out of 5 persons who leave Northern Ireland to go abroad deregistered from their family doctor)
- it is assumed that there is a lag between the date of arrival in Northern Ireland and the registration for primary care services; similarly, it is assumed that there is a lag between leaving Northern Ireland and deregistration, this is taken into account when using the GP registration data for migration estimates

6.2 Justification of rating

Population Estimates Unit (PEU)

PEU assesses the Northern Ireland internal migration estimates as being low risk because:

- the data are National Statistics and PEU are using the data for the identical purpose for which they are accredited
- the underlying data have a standardised collection process
- the quality assurance processes the data goes through at each stage

PEU judges that Northern Ireland internal migration estimates have a higher public profile due to their use in population estimates and the use of population estimates in resource allocation to the local level.

Given the low risk and higher public profile, PEU judges that an A1 assurance rating is appropriate for the Northern Ireland internal migration data.

Population Projections Unit (PPU)

PPU assesses the Northern Ireland internal migration estimates as being low risk because:

- the data are National Statistics and PPU are using the data for the identical purpose for which they are accredited
- the underlying data have a standardised collection process
- the quality assurance processes the data goes through at each stage

PPU deems that Northern Ireland internal migration estimates have a higher public profile due to their use in population projections and the use of population projections in resource allocation to the local level.

Given the low risk and higher public profile, PPU judges that an A1 assurance rating is appropriate for the Northern Ireland internal migration data.

Internal Migration Unit (IMU)

IMU assesses the Northern Ireland medical card data as being low risk because:

- they are estimates derived from the best administrative data source, which are subsequently used in the production of internal migration estimates for Northern Ireland
- the underlying data have a standardised collection process
- the quality assurance processes the data goes through

IMU judges that Northern Ireland medical card data have a medium public profile due to their use in population projections and the use of population projections in resource allocation to the local level.

Given the low risk and higher public profile, IMU judges that an A1 assurance rating is appropriate for the Northern Ireland medical card data.