

Quality assurance of administrative data used in population statistics: Community Health Index



Published on 24 November 2022

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1. Overview of Community Health Index (CHI) extract

Data supplier:	Public Health Scotland (PHS)
Supplier info:	<p>PHS is Scotland's lead national agency for improving and protecting the health and wellbeing of all of Scotland's people. PHS is jointly sponsored by the Convention of Scottish Local Authorities (COSLA) and the Scottish Government, and collaborates with third sector organisations.</p> <p>The Data and Intelligence department of PHS provides health information, health intelligence, statistical services and advice that support the NHS in progressing quality improvement in health and care and facilitates robust planning and decision making.</p>
Data type (counts or unit records)	Anonymised unit records
Data content:	Anonymised extract of live CHI system. Variables include demographic information, GP practice details and some administrative information.
Supply schedule:	Annually: the CHI extract is requested for August of the reference year.
Use of data:	Mid-year population estimates Small area population estimates National population projections Sub-national population projections
Matrix Score	A1 – Basic Assurance
Last updated	24 November 2022

2. Data source information

Two patient registers are used in the creation of population estimates; the National Health Service Central Register (NHSCR) and the Community Health Index (CHI). The NHSCR for Scotland records the movement of patients to and from NHS Board areas within Scotland. The CHI is a register of all NHS patients in Scotland. It is used throughout NHS Scotland and contains data on patient demographics and some clinical information on aspects of healthcare.

How is CHI data used to estimate migration from within Scotland?

National Records of Scotland (NRS) use an extract of NHSCR data to estimate moves between NHS Board areas, which are considered the best estimates of internal migration within Scotland. Unlike the NHSCR extract, the CHI data contains

more detailed information which allows for the distribution of migration to smaller geographies including council areas and data zones.

Two extracts of CHI data are compared one year apart to estimate migration in, out and between smaller geographies. These migration flows are then constrained to the figures at NHS Board level which come from the NHSCR.

How is CHI data used to estimate migration to/from outside Scotland?

Migration flows between Scottish NHS Board areas and the rest of the UK are estimates from NHSCR data and equivalent data sources from other parts of the UK. Similarly, international migration flows to and from Scotland are distributed to NHS Board areas mainly using NHSCR data. More information on how NHSCR data is used to estimate these flows is available from the [NHSCR QAAD](#).

CHI data is then used to distribute migration flows to areas within Scottish NHS Board areas using the same method as within Scotland migration.

3. Operational context and administrative data collection (Data collection)

The CHI is a complete register of all patients in NHS Scotland. When a patient registers at a GP practice, their details are matched to a record on the CHI or a new record is created. Every new patient who registers with a Scottish NHS doctor is allocated a CHI number. When a person dies, the date of death is added to CHI, but the record is not removed.

When a person from outside the UK first registers with an NHS doctor in Scotland, an indicator is used to denote this. GP registration data is then collected by the NHSCR and CHI. This indicator is used as the basis to extract data for age, sex and area distribution within Scotland for migration from countries outside the UK..

The CHI consists of a series of eight regional databases linked by a search index. It is also linked to, or exchanges data with, a number of other systems including the Community & Prevention Care (CPC) systems, and the NHSCR. Access to the CHI is [strictly controlled](#) and is granted by application to either the CHI Advisory Group or the Public Benefit and Privacy Panel dependent on the proposed use of the data.

4. Communication with data supply partners

Anonymised extracts of CHI data are provided to the Population and Migration Statistics team in NRS by Public Health Scotland.

There is a Data Sharing Agreement in place for the provision of an annual anonymised extract of the CHI. The agreement covers:

- Purpose of the data sharing
- Data to be shared
- Process for sharing
- Basis for sharing
- Information assurance and security

- Information management
- Privacy notices
- Retention and deletion
- Management of agreement
- Breach and dispute procedures
- Description of variables
- Disclosure control

Statisticians in NRS contact the team at PHS by email in August of the reference year. A review of the Data Sharing Agreement is held regularly to maintain and/or update the requirements. Once the agreement is finalised, the data is delivered via the web based Secure File Transfer Protocol system named Globalscape.

There are very strong links between the NRS NHSCR team and providers of the CHI, with the head of the NHSCR sitting on the CHI Advisory Group and other CHI working groups. The Population and Migration Statistics team are in regular contact with the data suppliers and discuss any changes that might affect the data. These close working relationships ensure that issues and planned changes to data collection can be considered before the data is used to produce population estimates.

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

Data held on the CHI needs to be up-to-date to ensure patients can be positively identified and records kept accurate. Data quality exercises are carried out to keep patient demographic details, as well as registration status, current and up-to-date. Other exercises require input from GP Practices. These may be for individual patients or a group of patients.

6. Quality assurance investigations carried out by the NRS Population and Migration Statistics team

When the extract of CHI data is received, it is checked by running frequency and cross checks on the data, comparing with previous years and also comparing summary data with the NHSCR. NRS validates the postcodes of the CHI records on each extract against the NRS postcode index. Mapping both extracts to the same version of the postcode index avoids creating false migrants due to postcodes being introduced or deleted between the dates of the two extracts.

Certain records are removed from the CHI extract, such as:

- records with an invalid age
- records without a GP practice
- patients thought to be resident outside Scotland but registered with a Scottish GP
- other invalid records

Unusual patterns are investigated and any remaining queries are followed up with PHS.

7. Strengths and limitations of the data source

Strengths	Limitations
<ul style="list-style-type: none"> • CHI is a comprehensive source of record level data that covers the vast majority of the population. • Strong links between NRS, NHSCR for Scotland and CHI data providers. • CHI records contain detailed demographic information. 	<ul style="list-style-type: none"> • Patient registers do not pick up people who leave the UK (unless they inform their GP), leading to some inflation in the register. For this reason, additional sources are used to calculate international outflows. • Moves within Scotland cannot be picked up until the patient registers with a new GP. As a result, some people will be recorded in the wrong area. This is particularly an issue among younger adult males. • There may be a lag in migrants into Scotland registering with a GP, or those who have moved within Scotland updating their details with a GP. Therefore, a two month lag is assumed between a move and registration of the move with a GP. <p>There is a delay in new born babies appearing in patient registers with a postcode until they are registered with a GP.</p>

8. Risk/Profile Matrix

This section contains a risk/profile matrix for the CHI extract. The matrix reflects the levels of risk of data quality concerns and the public interest profile of the statistics. These have been determined by a review undertaken by the NRS Population and Migration Statistics team using the information contained within the UK Statistics Authority's [Administrative Data Quality Assurance Toolkit](#). For the use of data for this project, the cell highlighted is appropriate:

Level of risk of quality concerns	Public interest profile		
	Low	Medium	High
Low	Statistics of low quality concern and low public interest. [A1]	Statistics of low quality concern and medium public interest. [A1/A2]	Statistics of low quality concern and high public interest. [A1/A2]
Medium	Statistics of medium data quality concern and low public interest. [A1/A2]	Statistics of medium quality concern and medium public interest. [A2]	Statistics of medium quality concern and high public interest. [A2/A3]
High	Statistics of high data quality concern and low public interest. [A1/A2/A3]	Statistics of high quality concern and medium public interest. [A3]	Statistics of high quality concern and high public interest. [A3]

*A1/A2/A3 – definitions supplied UK Statistics Authority's [Administrative Data Quality Assurance Toolkit](#).

Justification for Matrix Score

The public interest profile has been set to high due to the use of population estimates and projections statistics to make decisions on resource allocation by central and local government.

The risk of quality concerns has been set to low given the many quality exercises carried out to keep patient details on the CHI up-to-date. The CHI has good coverage of GP patients in Scotland as they must be registered on the CHI in order to receive GP services. Patient information on the CHI is kept up-to-date to ensure patients can be positively identified and that records are kept accurate.

As the scores were deemed low for risk of quality concerns and high for public interest profile, the assurance rating was deemed by the Population and Migration Statistics team as A1: Basic assurance (highlighted in matrix above).

9. Useful links and contact details

You can access 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](#).

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Enquiries and suggestions

Please contact our Statistics Customer Services if you need any further information. Email: statisticscustomerservices@nrscotland.gov.uk

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