3.2 Emergency admissions for children with lower respiratory tract infections (LRTIs)

Indicator Reference: I00714

Indicator Quality Statement

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Introduction

Context for the quality statement.

This data quality report accompanies the Official Statistics release of new data points for NHS Outcomes Framework (NHS OF) Indicator 3.2, Emergency admissions to hospital of children with lower respiratory tract infections (LRTIs).

This indicator forms part of the NHS Outcomes Framework, which is designed to provide national level accountability for the outcomes the NHS delivers, and act as a catalyst for driving transparency, quality improvement and outcome measurement throughout the NHS.

The NHS Outcomes Framework sets out the national outcome goals that the Secretary of State will use to monitor the progress of NHS England. It does not set out how these outcomes should be delivered, it is for NHS England to determine how best to deliver improvements by working with Clinical Commissioning Groups (CCGs) to make use of the tools at their disposal.

This indicator is scheduled to be assured through the Indicator and Methodology Assurance Service (IMAS), which is managed by NHS Digital. Under the regulations within the Health and Social Care Act, a national database of quality assured indicators was established and this contains details of all indicators which have been approved under the assurance process. Further details about the IMAS can be found in the ‘Accuracy and Reliability’ section.

Related Links

The NHS Digital website: www.digital.nhs.uk


Relevance

The degree to which the statistical product meets user needs in both coverage and content.

Background

The NHS Outcomes Framework indicators were developed by the Department of Health in 2010 to provide national level accountability for the outcomes that the NHS deliver. Each year the Department decide which indicators will be included in the framework based on consultation with internal and external stakeholders. Data for the indicators come from a wide range of sources which become available at different times of the year. NHS Digital publish indicator data on a quarterly basis, each release includes the indicators for which new data have recently become available.
**Purpose of this indicator**

Indicator 3.2 is an improvement area in domain 3 which reflects the importance of helping people to recover from episodes of ill health or following injury. This can be seen as two complementary objectives: preventing conditions from becoming more serious (wherever possible), and helping people to recover effectively.

Progress in preventing LRTIs from becoming more serious will be measured using this indicator. LRTIs in children lead to a high number of emergency bed days. Where children are admitted for LRTIs it may indicate that they have deteriorated more than should have been allowed by the adequate provision of healthcare in primary care or as an outpatient in hospital.

Providing effective ambulatory care for these conditions will lead to better patient care and case management, and a reduction in avoidable emergency admissions, which are costly and expose patients to otherwise avoidable clinical risks such as health care acquired infections.

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**Accuracy and Reliability**

*How well the information is recorded and transmitted, and, where applicable, the proximity between an estimate and the unknown true value.*

The indicator values and confidence intervals are calculated by the NHS Digital using the methodology described in the specification document, which can be found on the NHS Digital indicator portal using the link at the beginning of this document. The numerator is sourced from the Hospital Episode Statistics (HES) database which is held and managed by NHS Digital. The denominator is sourced from the mid-year population estimates, which are supplied by the Office for National Statistics (ONS).

The deprivation breakdowns are constructed by NHS Digital using mid-year population estimates for small geographies supplied by ONS and deprivation scores produced by the Department for Communities and Local Government (DCLG). Small geography population estimates are sometimes referred to as Lower Super Output Area (LSOA) population estimates.

Details about the accuracy and reliability of each of these data sources are included below together with the checks that take place to help achieve this.

**NHS Digital IMAS team processes**

This indicator is scheduled to be assured by the Indicator and Methodology Assurance Service (IMAS). This is a service provided for Health and Social Care, which assesses factors such as the statistical methodology, the purpose of the indicator and the quality of the data source for the purpose of a given indicator.

The IMAS assessment criteria have been improved over time to become more robust and now require significant detail on areas such as the quality of source data. The
assessment provides users with assurance of the suitability of the indicator and its data source. If significant issues are found, the indicator would not meet the IMAS assessment criteria and the issues would need to be investigated. If we were unable to resolve significant issues, the indicator would not be published.

Once indicators have been assured and published, they are reviewed every few years to ensure their continued accuracy and suitability.

Further details of the IMAS can be found here: https://digital.nhs.uk/services/indicator-methodology-and-assurance-service

**NHS Digital clinical indicators team processes**

The clinical indicators team calculate the indicator values and confidence intervals for this indicator using automated processes in SAS and SQL software for efficiency and reliability. All numbers in the indicator data files are produced and checked by two different analysts.

The indicator values are calculated using data sets which are subject to natural and sampling variability, therefore the figures are considered to be estimates of the underlying circumstances.

The data files therefore include 95 per cent confidence intervals to quantify the precision of the estimated indicator values. The intervals show the range of values which we would expect the true value to lie in 95 per cent of the time. A narrower confidence interval shows that the estimated indicator value is a more precise estimate of the true indicator value.

It is important to note that small numerators can be more unstable and may provide more unstable indicator values, therefore these numbers should be interpreted with caution.

**Deprivation data**

The deprivation breakdowns for this indicator are calculated using the 2015 and 2019 Index of Multiple Deprivation (IMD) scores (year dependent) which are based on the 2011 Lower Super Output Area (LSOA) boundaries.

More information about the 2015 IMD scores can be found at this link: https://www.gov.uk/government/statistics/english-indices-of-deprivation-2015

More information about the 2019 IMD scores can be found at this link: https://www.gov.uk/government/statistics/english-indices-of-deprivation-2019

**Mid-year population estimates**

The mid-year estimates used to calculate the indicator values refer to the estimated population of England on 30 June of the reference year and are based on 2011 boundaries. These data are National Statistics and therefore comply with the Code of Practice for Official Statistics and are considered to be of good quality.

The estimates relate to the usually resident population. They account for long-term
international migrants (people who change their country of usual residence for a period of 12 months or more) but do not account for short-term migrants (people who come to or leave the country for a period of less than 12 months). This approach is consistent with the standard UN definition for population estimates.

The ONS has undertaken a long-term programme of work to improve the population and migration statistics that it produces. Examples of this include an interdepartmental task force set up in 2006 to identify improvements that could be made and the Migration Statistics Improvement Programme set up in April 2008, which included, among other things, work on improving the International Passenger Survey and improving demographic models for population and migration statistics. More information about these work streams can be found at the below links.


Population estimates are produced using a well-established demographic approach called the cohort component method. This involves combining information from a number of data sources including the previous census, survey data and administrative registers. The data sources used are the best that are available on a nationally consistent basis down to local authority level, but the estimates are subject to the coverage and error associated with these sources. Information from administrative registers such as the numbers of births and deaths are considered to be very reliable.

Estimates of international migration are obtained from the International Passenger Survey (IPS). Although national figures have relatively small levels of uncertainty, at local levels the sample counts in the IPS are small. The ONS combine data across years and distribute figures using other administrative data sources in order to compensate for this. The ONS state that the impact of uncertainty associated with net migration flows is only small as a percentage of the local authority mid-year estimates.

One source of potential inaccuracy in the estimates is the use of sample surveys in the derivation of the census and international migration estimates. The sampling error from those sources allows the derivation of an estimated confidence interval of +/-0.2 per cent. This means that if the surveys were repeated many times, with a new sample selected each time, we would expect the true value to be within +/-0.2 per cent of the estimated value 95 per cent of the time.

The ONS use NHS patient registers in their calculation of the usually resident population. These registers have recognised limitations in relation to their timeliness and coverage due to delays in GP registration when individuals move to a new local authority. This is prevalent amongst young men for example. An example of this is Oadby and Wigston, where the detailed age distribution for males is likely to underestimate the number of 23-27 year olds and overestimate the number of 21-22 year olds. The ONS mitigate this by combining patient register data with Higher Education Statistics Agency.

Population estimates are subject to revisions; they are revised once new census data become available and if errors are discovered in the data. Further details on revisions can be found in the ‘Coherence and Comparability’ section.

Further information about the population estimates can be found at the below link:
Hospital Episode Statistics

The numerator data are sourced from the admitted patient care data of the Hospital Episode Statistics (HES) database, which holds record level data about activity conducted in NHS hospitals in England, and NHS commissioned activity in independent sector providers. The HES admitted patient care data is published annually and has been designated as National Statistics. The data therefore comply with the Code of Practice for Official Statistics and are considered to be of good quality.

The HES database is generated by NHS Digital to be used as a source of information about hospital-based activity in the English NHS. It is derived from data supplied to the Secondary Uses Service (SUS) database whose primary purpose is to support the Payment by Results (PbR) mechanism of commissioners paying hospital providers for the activity they undertake. Each month hospital providers are required to submit records of activity that has taken place, including dates and administrative information relating to their arrival and departure from hospital (e.g. admission method / source), details relating to the patient (e.g. age, gender, place of residence), diagnoses that were relevant to their care, and procedures and interventions that were performed during the hospital stay.

HES data is published monthly and throughout the year providers have the opportunity to restate their cumulative position in order to correct errors and ensure the data is complete and representative; monthly HES is therefore considered provisional throughout the year. On an annual basis the HES data is generated for a year, this is final data and is not subject to change once generated. The finalised annual HES data is used for this indicator.

During the process of the creation of the HES database, the HES data quality team assess and improve the quality of the submission from providers using a range of techniques:

1. Input validation – records must adhere to defined rules governing their content.
2. Invalid values recoded – invalid entries are grouped into ‘invalid’ default values, out of range or invalid dates are recoded to identify them as such.
3. Duplicates are identified and removed – this is done automatically in monthly processing and with providers’ permission on generation of the annual data.
4. Automated processes aggregate data – a time series is generated and unusual patterns of activity investigated.
5. HES data quality reports – these are stored in a live data file and summarise known issues and limitations in the data.
6. Provider engagement – the data quality team engage data suppliers in an effort to improve quality and completeness.
The key fields used in this indicator are some of the most commonly used and inspected values in the database. The demographic information relating to the patient and diagnosis and procedure information are key components of the PbR tariff, which affects the payment associated to the activity, and so there is a significant imperative for this information to be recorded accurately.

The Department of Health commission the reference cost assurance program whereby a selection of providers are audited, including an investigation of the accuracy of their clinical coding in a sample of records. The 2014/15 findings can be found here:

The findings of this audit show that there is variation in recording accuracy and that sometimes recording of primary diagnosis and/or procedure is incorrect. The focus of the audit is on the financial implication of recording and the above document does not describe the extent to which primary diagnosis and procedure codes are incorrect in ways which will affect this indicator.

There is no known reason to suspect that data quality issues affecting this indicator deviate from the national picture.

At the point of the HES data being released for analysis the HES team in NHS Digital release an annual publication summarising key fields and providing a statistical commentary. The 2015/16 report can be found here:

Further information about HES can be found below:

### Timeliness and Punctuality

**Timeliness refers to the time gap between publication and the reference period.**

**Punctuality refers to the gap between planned and actual publication dates.**

Mid-year population estimates for higher-level geographies (England, region and local authority level) are released around June each year.

Mid-year population estimates for Lower Super Output Areas (LSOAs) which are required to calculate the deprivation breakdowns for this indicator are released around the end of October each year.

The HES admitted patient care annual data are released in November each year.

This indicator is published in February each year; this is the earliest release date following receipt of all the data sources.
**Accessibility and Clarity**

**Accessibility** is the ease with which users are able to access the data, also reflecting the format in which the data are available and the availability of supporting information.

**Clarity** refers to the quality and sufficiency of the metadata, illustrations and accompanying advice.

There are four main locations where members of the public can access resources and information related to the NHS Outcomes Framework (NHS OF). These are listed below together with a link to their location and information about what resources are available from each.

1. NHS Outcomes Framework Home Page
   - Summary of the framework
   - Latest, upcoming and previous releases of the NHS Outcomes Framework publications

2. Quarterly Publication Web Pages
   Click here to view publications
   - Commentary on the indicators that were updated in that release
   - The latest information and data for all NHS OF indicators Excel and CSV format data files, dashboard, data quality statements and indicator specifications for all indicators
   - A publication schedule showing when each indicator will next be published

3. Data.gov website
   http://data.gov.uk/
   You can also find data for the NHS OF on the data.gov website. The government's open data policy is about making data easy to find, easy to use and free to access. The data.gov website supports this policy by bringing datasets from government departments and public sector bodies together in one place.
Coherence and Comparability

**Coherence** is the degree to which data that are derived from different sources or methods, but refer to the same topic, are similar.

**Comparability** is the degree to which data can be compared over time and domain.

**Comparability**

Updated population figures – February 2016

ONS announced an error in the 2013 mid-year population estimates which are used in calculations for this indicator. The error was due to individuals being included within the wrong local authorities and therefore it affected regional, local authority and LSOA figures but did not impact the national total.

The error only affected the 18-59 age range and affected males more than females. A total of 45 lower tier local authorities and seven regions were affected but the errors were small. The largest error was for Forest Heath council but the value of the error only accounts for 3 per cent of the corrected figure.

ONS released a corrected 2013 file for the regional and local authority counts and these were used to revise the regional and local authority figures in the February 2016 NHS Digital data files. This has resulted in some small increases and decreases to the affected areas.

Updated deprivation data - February 2016

In February 2016, NHS Digital used the corrected 2013 LSOA mid-year population estimates to revise the 2013 indicator data. The LSOA file is used to allocate people to deprivation deciles and therefore deprivation is the only breakdown in the NHS Digital data affected by this update.

The NHS Digital deprivation data for all years was also updated in February 2016 using the 2015 Index of Multiple Deprivation (IMD) scores. The deprivation breakdowns were previously calculated using the adjusted IMD2010 scores calculated by Public Health England.

Both of these updates affected the counts of people within deciles but not the overall yearly totals. Almost all of the deprivation decile figures were affected by the change. There were some changes to the numerators, confidence intervals and indicator values. Denominator values were also affected. These changes do not affect the comparability of the data over time since all years have been updated using the same methodology.

Comparability of indirectly standardised rates

Indirect standardisation is unsuitable to make comparisons between Local Authority and Regional areas unless the areas being compared have a similar age structure to the standard (England) population. These rates can be used to compare an area to the national (England) figure.
**Coherence**

The main comparator is the Compendium indicator ‘Emergency hospital admissions: children with LRTIs’ which can be found on the NHS Digital Indicator Portal.

The NHS Outcomes Framework indicator uses the same methodology as the Compendium indicator but increases the age range up to 19 years. The Compendium indicator included children 0-15 but there was concern that older children were being missed and the breadth of the problem of LRTIs in children was not being captured. The decision to increase the age cut-off to include ages up to 19 years followed research and expert consultation.

**Trade-offs between Output Quality Components**

Trade-offs are the extent to which different aspects of quality are balanced against each other.

A number of factors outside the control of hospitals, such as the socio-economic mix of local populations and events prior to hospitalisation, may determine whether a patient gets admitted or not and may influence rates.

Differences in case-mix, comorbidities and other potential risk factors also contribute to the variation.

The patterns of providing care may vary between organisations in terms of: extent of treatment in primary care settings; referral policies and practices; hospital outpatient facilities/walk-in clinics; and hospital inpatient admission policies and practices for children.

**Assessment of User Needs and Perceptions**

The processes for finding out about users and uses, and their views on the statistical products.

Comments about the NHS Outcomes Framework data or publications can be made through the NHS Digital general enquiries team:

  - Email: enquiries@nhsdigital.nhs.uk
  - Telephone: 0300 303 5678

**Performance, Cost and Respondent Burden**

The effectiveness, efficiency and economy of the statistical output.

This indicator makes use of existing data sources.
Indicator Quality Statement: NHS Outcomes Framework indicator 3.2, Emergency admissions for children with lower respiratory tract infections (LRTIs)

Confidentiality, Transparency and Security

The procedures and policy used to ensure sound confidentiality, security and transparent practices.

The NHS Outcomes Framework publication is subject to a standard NHS Digital risk assessment prior to issue. Disclosure control is implemented where judged necessary.

A detailed specification document describing the methodology used to calculate this indicator is available using the NHS Outcomes Framework publication link in the Introduction section of this document.

The Code of Practice for Official Statistics is followed regarding security and release of information prior to publication.