NHS Outcomes Framework

Domain 3
Helping people to recover from episodes of ill health or following injury

Indicator specifications

Version: 3.0
Date: February 2020
Author: Clinical Indicators Team
## Document Management

### Revision history

<table>
<thead>
<tr>
<th>Version</th>
<th>Date</th>
<th>Indicator</th>
<th>Summary of Changes</th>
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<tr>
<td>1.0</td>
<td>November 2011</td>
<td>3a 3.2</td>
<td>Indicator introduced</td>
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<td>1.1</td>
<td>March 2012</td>
<td>3a 3.2</td>
<td>Breakdown details added</td>
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<td>1.2</td>
<td>June 2012</td>
<td>3a 3.2</td>
<td>Indicator now indirectly standardised</td>
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<td></td>
<td></td>
<td>3b</td>
<td>Indicator introduced</td>
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<tr>
<td>1.3</td>
<td>December 2012</td>
<td>3a 3.2</td>
<td>Indicator standardised to 2011/12 using 2011 mid-year population estimates</td>
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<tr>
<td></td>
<td></td>
<td>3.5.i 3.5.ii 3.6.i 3.6.ii</td>
<td>Indicator introduced</td>
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<tr>
<td>1.4</td>
<td>March 2013</td>
<td>3a</td>
<td>Indicator now includes children</td>
</tr>
<tr>
<td>1.5</td>
<td>May 2014</td>
<td>3a 3.2</td>
<td>Further disaggregations published (upper tier local authority, region and annual figures)</td>
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<td></td>
<td></td>
<td>3.2</td>
<td>Further disaggregation published (annual figures)</td>
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<tr>
<td>1.6</td>
<td>August 2014</td>
<td>3a 3.2</td>
<td>Update of specification to refine HES filters and include an additional ADMIMETH filter</td>
</tr>
<tr>
<td>1.7</td>
<td>November 2014</td>
<td>3.5.i 3.5.ii</td>
<td>Addition of breakdowns by deprivation quintile, lower tier local authority, region and hospital provider (available for 2013 only)</td>
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<td>1.8</td>
<td>February 2015</td>
<td>3a 3.2</td>
<td>Deprivation decile breakdown added</td>
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<td></td>
<td>3.5.i 3.5.ii</td>
<td>Update with 95% confidence intervals</td>
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<td>1.9</td>
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<td>Revision history has been consolidated</td>
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<tr>
<td>2.0</td>
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<td>Indicator introduced&lt;br&gt;Changed links to Indicator Portal</td>
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<td>Updated links, data source and disclosure control</td>
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<td>3a 3.2</td>
<td>Updated deprivation sections. Calculation sections revised to give more clarity.</td>
</tr>
<tr>
<td>2.4</td>
<td>May 2017</td>
<td>3b</td>
<td>Updated directions to methodology on the Indicator Portal</td>
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<td>2.5</td>
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<td>All</td>
<td>Links updated</td>
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<tr>
<td>2.6</td>
<td>May 2018</td>
<td>All</td>
<td>Update to reflect new name for Ministry of Housing, Communities &amp; Local Government</td>
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<tr>
<td>2.7</td>
<td>August 2018</td>
<td>3.2</td>
<td>Added indicator title back into the contents page</td>
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<tr>
<td>2.8</td>
<td>February 2019</td>
<td>3.2</td>
<td>Updated methodology with new ICD10 codes to make indicator in line with similar one from Public Health England. HES suppression rules updated.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3a</td>
<td>HES suppression rules updated.</td>
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<tr>
<td>2.9</td>
<td>March 2019</td>
<td>3b</td>
<td>Updated definitions for clarity with some minor changes as part of the review of the Readmissions indicators.</td>
</tr>
<tr>
<td>3.0</td>
<td>February 2020</td>
<td>3b</td>
<td>Updated definitions following changes agreed with Indicator Consultation Group (part of the on-going review of the Readmissions indicators.)</td>
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<tr>
<td></td>
<td></td>
<td>2.3.i, 2.3.ii</td>
<td>Deprivation information updated (to include 2019)</td>
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3a Emergency admissions for acute conditions that should not usually require hospital admission

Indicator assurance

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<tr>
<th>Status</th>
<th>Date</th>
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</thead>
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<tr>
<td>Methodology Review Group (MRG) recommended</td>
<td>February 2013</td>
</tr>
<tr>
<td>Indicator Governance Board (IGB) assured</td>
<td>Not yet assured</td>
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Overview

Indicator title
3a Emergency admissions for acute conditions that should not usually require hospital admission

Indicator family name
NHS Outcomes Framework: Domain 3 – Helping people to recover from episodes of ill health or following injury
Overarching indicator

Outcome sought
Preventing conditions from becoming more serious.

Detailed Descriptor

Plain English description
Indicator 3a measures the number of emergency admissions to hospital in England for acute conditions such as ear/nose/throat infections, kidney/urinary tract infections and angina, among others, that could potentially have been avoided if the patient had been better managed in primary care.

Primary care describes community based health services that are usually the first, and often the only, point of contact that patients have with the health service. It covers services provided by family doctors (GPs), community and practice nurses, community therapists (such as physiotherapists and occupational therapists), community pharmacists, optometrists, dentists and midwives.

Technical description
Emergency admissions to hospital (indirectly standardised rate per 100,000 population) of persons with acute conditions (ear/nose/throat infections, kidney/urinary tract infections,
angina, among others) that usually could have been avoided through better management in primary care.

**Data sources**

**Denominator:**

**Numerator:**
Hospital Episode Statistics (HES) Admitted Patient Care (APC), provided by NHS Digital – National Statistics

Final annual and quarterly HES data are usually released in the November following the financial year-end.

**Construction**

**Calculation methodology**

**Introduction**
This indicator measures the rate of emergency hospital admissions per 100,000 population for patients with acute conditions that should not usually require hospital admission. The numerator is given by the number of finished and unfinished admission episodes, excluding transfers, for patients of all ages with an emergency method of admission and with a primary diagnosis of an acute condition as detailed below. A data period of three months is used to produce each of the quarterly outputs. The rate is indirectly standardised by age and gender to the reference year 2012/13.

**Data Filters**
See appendix 1 for descriptions of the conditions included in indicator 3a.

The data fields and filters that are used are as follows. Details of HES fields and classifications are available in the HES Data Dictionary – see https://digital.nhs.uk/data-and-information/data-tools-and-services/data-services/hospital-episode-statistics/hospital-episode-statistics-data-dictionary

1. **Field Name:** DIAG_3_01, DIAG_4_01,
   **Description:** Primary diagnosis code consisting of 4 characters
   **Conditions:** Any of (a) to (i) are true. Defined as follows:
   a) (DIAG_3_01 is equal to any of: A36, A37, B05, B06, B26, J10, J11, J14, OR
      DIAG_4_01 is equal to any of: J13X, J153, J154, J157, J159, J168, J181, J188, B161, B169, M014)
AND
DIAG_3_CONCAT does not contain: D57
[where DIAG_3_CONCAT is a concatenated field containing the values of all 20 diagnosis fields separated by commas. This condition excludes episodes with a subsequent diagnosis of D57 (Sickle-cell disorders)].

b) DIAG_4_01 is equal to any of: I240, I248, I249
AND
(OPERTN_3_CONCAT does not contain any of (A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, V, W, X0, X1, X2, X4, X5)
OR OPERTN_3_CONCAT IS MISSING )

c) DIAG_3_01 is equal to any of: E86, K52, A04, A08, A09
OR
DIAG_4_01 is equal to any of: A020, A059, A072

d) DIAG_3_01 is equal to any of: N10, N11, N12
OR
DIAG_4_01 is equal to any of: N136, N159, N390, N300, N308, N309.

e) DIAG_4_01 is equal to any of: K250, K251, K252, K254, K255, K256, K260, K261, K262, K264, K265, K266, K270, K271, K272, K274, K275, K276, K280, K281, K282, K284, K285, K286
OR
DIAG_3_01 is equal to either of: K20, K21

f) (DIAG_3_01 is equal to any of: L01, L02, L03, L04, L88
OR
DIAG_4_01 is equal to any of: L080, L088, L089, L980, I891)
AND
OR
OPERTN_3_CONCAT is equal to: S47
OR
OPERTN_3_CONCAT IS MISSING )
g) DIAG_3_01 is equal to any of: H66, H67, J02, J03, J06
   OR
   DIAG_4_01 is equal to either of: J312, J040.

h) DIAG_3_01 is equal to any of: K13, K12, K02, K03, K04, K05, K06, K08
   OR
   DIAG_4_01 is equal to: A690, K098, K099

i) DIAG_3_01 is equal to either of: R56, O15
   OR
   DIAG_4_01 is equal to: G253.

Rationale: This gives the primary diagnosis of the patient.

2. Field Name: STARTAGE
   Description: Age at start of episode
   Conditions: Is between (inclusive): 0 and 120
   OR
   is between 7001 and 7007 (for babies)
   Rationale: This field describes the age of the patient at the start of their episode of care. For this indicator all ages are considered.

3. Field Name: ADMIMETH
   Description: Method of admission
   Conditions: Is equal to any of: 21, 22, 23, 24, 25, 28, 2A, 2B, 2C or 2D
              (25, 2A, 2B, 2C and 2D are valid from April 2013 and replace 28)
   Rationale: This restricts the data to emergency admissions only.

4. Field Name: EPISTAT
   Description: Episode status
   Conditions: Is equal to one of: 1 or 3
   Rationale: This includes both finished and unfinished hospital episodes.

5. Field Name: ADMIDATE
   Description: Date of admission
   Conditions: Limited to admissions within the current financial year split by quarter.
               Quarter 1: 1st April to 30th June;
               Quarter 2: 1st July to 30th September;
Quarter 3: 1<sup>st</sup> October to 31<sup>st</sup> December;
Quarter 4: 1<sup>st</sup> January to 31<sup>st</sup> March.

**Rationale:** Data are presented quarterly with an admission date within the quarter of interest.

6. **Field Name:** SEX  
**Description:** Sex of patient  
**Conditions:** Is equal to either of: 1 or 2  
**Rationale:** Data are shown for males and females separately. Data for persons are the sum of males and females and excludes the small number of records where sex was unknown or unspecified.

7. **Field Name:** EPIORDER  
**Description:** Episode order  
**Conditions:** Is equal to: 1  
**Rationale:** This restricts the data to the first episode in a hospital spell.

8. **Field Name:** ADMISORC  
**Description:** Source of admission  
**Conditions:** Is not equal to any of: 51, 52, 53  
**Rationale:** This excludes transfers.

9. **Field Name:** EPITYPE  
**Description:** Episode type  
**Conditions:** Is equal to: 1  
**Rationale:** This restricts the data to general episodes (excludes birth, delivery and mental health episodes).

10. **Field Name:** CLASSPAT  
**Description:** Patient classification  
**Conditions:** Is equal to: 1  
**Rationale:** This restricts the data to ordinary admissions (excludes day case, regular day/night attenders and mothers/babies using only delivery facilities).

11. **Field Name:** RESLADST (2003/04 to 2010/11)
RESLADST_ONS (2011/12 onwards)

Description:  Local authority district

Conditions:  Is equal to a valid English Local Authority or equal to ‘U’

Rationale:  This restricts the data to patients resident in England. ‘U’ represents ‘England unspecified’.

Calculation

Denominator
ONS mid-year population estimates (based on the 2011 Census).

Numerator
The number of finished and unfinished admission episodes, excluding transfers, for patients with an emergency method of admission and with a primary diagnosis of an acute condition that should not usually require hospital admission as shown in appendix 1.

Standardised admission ratios (SARs)
Counts by category firstly need to be broken down into age and gender groups. The age groups used are 0-4, 5-9, 10-14, 15-18, 19-24, 25-29, 30-34, 35-39, 40-44, 45-49, 50-54, 55-59, 60-64, 65-69, 70-74, 75-79, 80-84, 85-89 and 90+.

The SARs can then be calculated by dividing the sum of the observed number of admissions by the sum of the expected number of admissions for each category and converted into a ratio by multiplying it by 100:

\[
SAR = \frac{O}{E} \times 100 = \left( \frac{\sum O_i}{\sum E_i} \right) \times 100 = \frac{\sum O_i}{\sum n_i \lambda_i} \times 100
\]

where:

- \( O_i \) is the observed number of events in the subject population in age- and gender group \( i \) (i.e. the number of admissions for that group in a given year or quarter)

- \( E_i \) is the expected number of events in the subject population in age- and gender group \( i \), that is, the expected number of events in that age- and gender group if the population in that year/quarter had the same distribution as the reference population (2012). It is calculated by multiplying the number of individuals in that group \( n_i \) by the crude age- and gender-specific rate in the reference population \( \lambda_i \). This figure is then multiplied by 100 (for presentational purposes)

- \( n_i \) is the number of individuals in the subject population in age- and gender group \( i \) (i.e. the number of individuals in that group in a given year or quarter)
• $\lambda_i$ is the crude age- and gender specific rate in the standard population in age-and gender group $i$ (i.e. the crude age- and gender specific rate for that age- and gender group in 2012, which is the reference year)

**Indicator value**

The indicator value is the indirectly standardised rate (ISR) of admissions per 100,000 population. It is standardised by age and gender to the reference year. The ISR is calculated using the crude rate of admissions for England for the reference year, multiplied by the SAR for the category, and multiplied by 1,000 to get a rate per 100,000 population. (Note that the SAR is expressed as a ratio, therefore the raw rate has already been multiplied by 100).

**SAR Confidence Intervals**

When calculating 95% confidence intervals for indirectly standardised ratios, it is assumed that the standard rates come from a population sufficiently large as to assume their sampling variance is negligible, and that the observed number of events $O$ follows a Poisson distribution. Where the number of observed events is less than 500, the exact upper and lower limits for $O$ are found from a look-up table and used to calculate the respective limits of the ratio. Where the number of observed events is 500 or more, confidence intervals are calculated using the method described by Goldblatt and Jones\(^1\). The lower and upper confidence limits for the SAR are denoted by SAR\_LL and SAR\_UL.

**For $O < 500$:**

$$\text{SAR\_LL} = \frac{O_{LL}}{E} \times 100$$

$$\text{SAR\_UL} = \frac{O_{UL}}{E} \times 100$$

where:

• $O_{LL/UL}$ are the exact lower and upper 95% confidence limits from a standard Poisson distribution table for the total number of observed events $O$ in the subject population.
• $E$ is the total expected number of events in the subject population.

**For $O \geq 500$ and $<900$:**

$$\text{SAR\_LL} = \frac{0.96 + O - 1.96\sqrt{(O+0.11)}}{E} \times 100$$

$$\text{SAR\_UL} = \frac{1.94 + O + 1.96\sqrt{O+0.96}}{E} \times 100$$

NHS Outcomes Framework: 3a – Emergency admissions for acute conditions that should not usually require hospital admission

For O >= 900:

\[ SAR_{UL} = \frac{1.94 + O + 1.96\sqrt{O} + 0.96}{E} \times 100 \]

\[ SAR_{LL} = \frac{0.962 + O - 1.9602\sqrt{O}}{E} \times 100 \]

**ISR Confidence Intervals**

The indirectly standardised rate upper and lower confidence intervals are calculated by multiplying the SAR upper and lower limits by the crude rate for the reference year.

**Deprivation breakdown**

The deprivation breakdowns for this indicator has been derived using Index of Multiple Deprivation (IMD) 2015 and 2019 scores (year dependent) based on 2011 lower super output area (LSOA) boundaries. These are published by the Ministry of Housing, Communities & Local Government (DCLG)


**Presentation**

**Breakdowns**

**Time periods**

Quarterly and annual data from 2003/04 Q1 for all breakdowns

**Demographic**

Gender - male and female

Age – person

**Geographic**

Lower tier local authority – person

Upper tier local authority – person

Region - person

**Other**

Deprivation decile - person

Condition – person
Disclosure control

This indicator is calculated using HES data, following the HES Analysis Guide on suppression of small numbers. For 2017/18 data, new HES disclosure rules have been applied. For the Lower and Upper Tier Local Authority and Region breakdowns values based on counts between 1 and 7 are suppressed. All other values in the ‘Observed’ column are rounded to the nearest 5. Secondary suppression is not necessary using this method. Between 2013/14 and 2016/17 for the same breakdowns values based on counts between 1 and 5 were suppressed. Secondary suppression is then applied so that at least two sets of quarterly values are suppressed for each year and so that two sets of values are suppressed in each upper tier or region, where necessary. Prior to 2013/14 the same primary suppression was applied as for 2013/14 to 2016/17. Secondary suppression was applied so that at least 2 quarterly values were suppressed in each year. If only one local authority in a region was suppressed the regional value was also suppressed.

ONS population data were used for the denominator; the values were rounded to the nearest 100. The rounding was carried out after the indicator value was calculated.

Excel and CSV output

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<th>Column name</th>
<th>Output</th>
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<td>Year</td>
<td>Financial year</td>
</tr>
<tr>
<td>Quarter</td>
<td>Annual, quarter</td>
</tr>
<tr>
<td>Period of coverage</td>
<td>Actual time period the data cover</td>
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<tr>
<td>Breakdown</td>
<td>England, gender, age band, lower and upper tier local authority, region, deprivation decile, condition</td>
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<tr>
<td>Level</td>
<td>Detailed breakdown of each split - breakdown code</td>
</tr>
<tr>
<td>Level description</td>
<td>Further description of level/breakdown</td>
</tr>
<tr>
<td>Indicator value</td>
<td>Indirectly standardised rate (ISR) per 100,000 population</td>
</tr>
<tr>
<td>Lower CI</td>
<td>ISR lower 95% confidence interval</td>
</tr>
<tr>
<td>Upper CI</td>
<td>ISR upper 95% confidence interval</td>
</tr>
<tr>
<td>Standardised ratio</td>
<td>Standardised admission ratio</td>
</tr>
<tr>
<td>Standardised ratio lower CI</td>
<td>Standardised admission ratio lower confidence interval</td>
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<tr>
<td>Standardised ratio upper CI</td>
<td>Standardised admission ratio upper confidence interval</td>
</tr>
<tr>
<td>Observed</td>
<td>Number of observed events (numerator)</td>
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<tr>
<td>Population</td>
<td>Population count (denominator)</td>
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<tr>
<td>Expected</td>
<td>Number of expected events</td>
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<tr>
<td>Percent unclassified</td>
<td>The percentage of records where there is no LSOA or LA code recorded – displayed for lower and upper tier local authority, region and deprivation decile breakdowns</td>
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3b Emergency readmissions within 30 days of discharge from hospital

Indicator assurance

<table>
<thead>
<tr>
<th>Status</th>
<th>Date</th>
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<tr>
<td>Methodology Review Group (MRG) recommended</td>
<td>May 2012</td>
</tr>
<tr>
<td>Indicator Governance Board (IGB) assured</td>
<td>September 2012</td>
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Overview

Indicator title
3b Emergency readmissions within 30 days of discharge from hospital

Indicator family name
NHS Outcomes Framework: Domain 3 – Helping people recover from episodes of ill health or following injury
Overarching indicator

Outcome sought
Effective recovery from illnesses and injuries requiring hospitalisation.

Detailed Descriptor

Plain English description
This indicator measures the percentage of emergency admissions to any hospital in England occurring within 30 days of the most recent discharge from hospital.

Admissions for cancer and obstetrics are excluded as they may be part of the patient’s care plan.

Technical description
Indirectly age, sex, method of admission and diagnosis/procedure standardised percentage of emergency admissions to any hospital in England occurring within 30 days of the last, previous discharge from hospital after admission.

Admissions for cancer and obstetrics are excluded.

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2 Includes activity in English NHS Hospitals and English NHS commissioned activity in the independent sector.
(Note: when using indirect standardisation, it is inappropriate to compare sub-geographies with each other – all comparisons should be made with the national figure.)

**Data sources**

The records for the denominator and the numerator are taken from Hospital Episode Statistics for Admitted Patient Care (HES APC) linked as Continuous Inpatient (CIP) Spells.


**Denominator:**

The number of finished CIP spells within selected medical and surgical specialties with a discharge date up to 31st March in the financial year of analysis.

See below in the Construction section for exclusion criteria.

**Numerator:**

The number of finished and unfinished CIP spells intersecting the respective financial year, plus those up to 30 days into the next financial year that are emergency admissions within 0-29 days (inclusive) of the last, previous discharge from hospital (see denominator and 'Calculation Methodology' below).

**Construction**

**Calculation methodology**

**Introduction**

This indicator measures the percentage of emergency admissions to any hospital in England occurring within 30 days of the most recent discharge from hospital. Admissions for cancer and obstetrics are excluded.

**Data filters**

**Denominator**

The number of finished CIP spells within selected medical and surgical specialties, with a discharge date up to 31st March within the financial year of analysis. Day cases, spells with a discharge coded as death, maternity spells (based on specialty, admission or discharge episode type and primary diagnosis), and those with mention of a diagnosis of cancer or chemotherapy for cancer anywhere in the spell are excluded. Patients with mention of a diagnosis of cancer or chemotherapy for cancer anywhere in the 365 days prior to admission are also excluded.

The following fields and values are used to filter the denominator.

The CIP spell has:

1. Field Name DISDATE (discharge date)
Conditions Filters the whole period of the financial year being reported on., e.g. between 01/04/2017 and 31/03/2018 inclusive AND is equal to or after the ADMIDATE (date of admission).

2. Field Name DISMETH (method of discharge)
Conditions 1 or 3 (Discharged on clinical advice or discharged by a mental health review tribunal, i.e. not died, self-discharged or a baby or still in hospital).

3. Field Name ADMIMETH (admission method)
Conditions Contains: 11, 12, 13, 21, 22, 23, 24, 25, 28, 2A, 2B, 2C, 2D, 31, 32, 81, 82, 83, 84 or 89.

The FIRST episode in the CIP spell has:
4. Field Name EPIORDER (episode order)
Conditions Equals 1.

5. Field Name EPITYPE (episode type)
Conditions Equals 1. General episode types only.

6. Field Name CLASSPAT (patient classification)
Conditions Equals 1. Ordinary Admissions only.

7. Field Name STARTAGE (age at start of episode)
Conditions Value between 0 and 120 and 7001 and 7007 only. Value between 7001 and 7007 are converted to 0.

8. Field Name DOB (patient date of birth)
Conditions Not 01/01/1900 or 01/01/1901 representing unknown.

9. Field Name SEX (sex of patient)
Conditions Equals 1 or 2.

AND the LAST episode in the CIP spell has:
10. Field Name EPITYPE (episode type)
Conditions Equals 1. General episode types only.

AND exclude the whole CIP spell where ANY episode in the spell has:
11. Field Name DIAG_01 - DIAG_20 (any diagnosis)
Conditions C00*-C97*, D37*-D48* (any mention of a diagnosis of cancer) OR Z51.1* (any mention of chemotherapy for cancer).
Applies both within the reporting year or anywhere in the 365 days prior to admission for the patient.

OR

12. Field Name TRETSPEF (the specialised service within which the Patient is treated)
Conditions Not 501, 560, 610.
13. Field Name  DIAG_01 (primary diagnosis)
Conditions  Does not begin with ‘O’ (Obstetrics).

There is an additional 3 step piece of logic which is designed to ensure that the spells are allocated to the most appropriate diagnosis/procedure group for standardisation:

**Step A**
Searching all episodes from first to last, identify spells where there is a valid procedure\(^3\) and surgical specialty (taken from the episode where the procedure was found). These spells are standardised by procedure subgroup (procedures beginning with ‘Y’ or ‘Z’ are standardised in the ‘no procedure’ basket).

**Step B**
Excluding spells selected in step A, select spells where treatment function specialty in the first episode is surgical, these spells are standardised under the ‘no procedures’ basket.

**Step C**
Excluding those spells selected in step A and step B, select spells where treatment function specialty of the first episode is medical. These spells are standardised by diagnosis subgroup.

In all cases the first three characters of the respective diagnosis or procedure code is used.

Lists of specialties\(^4\) and sub-groups used above for filtering/standardisation are:


**Numerator**
The number of finished and unfinished CIP spells that are emergency admissions within 0-29 days (inclusive) of the last, previous discharge from hospital (see denominator), including those where the patient dies, but excluding the following: those with a main specialty and primary diagnosis upon readmission coded under obstetrics and those where the readmitting spell has a diagnosis of cancer (other than benign or in situ) or chemotherapy for cancer coded anywhere in the spell.

The date of the last, previous discharge from hospital, and the date and method of admission from the following CIP spell, are used to determine the interval between discharge and emergency readmission.

The numerator is based on a pair of spells, the discharge spell and the next subsequent readmission spell (this spell must meet the numerator criteria). The selection process thus

---

\(^3\) Validity is defined in this case as not being either: (1) a null value, (2) "." meaning “no operation performed”, (3) "&" meaning “not known”.

\(^4\) Taken from the NHS Data Dictionary
carries over the characteristics of the denominator for the discharge spell and applies additional ones to the readmission spell.

The following fields and values are used for the numerator:

The CIP spell has:
1. Field Name ADMIDATE (date of admission)
   Conditions Between 1st April of the financial year reporting on and 30th April of the following year.
   Conditions Filters the whole period of the financial year being reported on, plus one month., e.g. between 01/04/2017 and 30/04/2018 inclusive.

2. Field Name ADMIMETH (admission method)
   Conditions Contains: 21, 22, 23, 24, 25, 28, 2A, 2B, 2C, or 2D (emergency admissions).

The FIRST episode in the CIP spell has:
3. Field Name EPIORDER (episode order)
   Conditions Equals 1.

4. Field Name EPITYPE (episode type)
   Conditions Equals 1. General episode types only.

5. Field Name CLASSPAT (patient classification)
   Conditions Equals 1. Ordinary Admissions only.

AND ADMIDATE from the FIRST episode of the Readmission CIP spell minus DISDATE from the LAST episode in Discharge CIP spell ≤ 29 days.

Note: where there is more than one readmission within 30 days, each readmission is counted once, in relation to the previous discharge.

AND exclude where ANY episode in the CIP spell has:
6. Field Name DIAG_01 - DIAG_20 (any diagnosis)
   Conditions C00*-C97*, D37*-D48* (any mention of a diagnosis of cancer) OR Z51.1* (any mention of chemotherapy for cancer).
   Applies both within the reporting year or anywhere in the 365 days prior to admission for the patient.

   OR

7. Field Name TRETSPEF (the specialised service within which the Patient is treated)
   Conditions Not 501, 560, 610.

8. Field Name DIAG_01 (primary diagnosis)
   Conditions Does not begin with ‘O’ (Obstetrics).
Calculation

Indirect Standardisation

The first step is to calculate the casemix-specific rates for the standard population. The dataset described above is aggregated with counts of readmissions (numerator) and previous discharges (denominator) grouped by:

- Age based on STARTAGE using the following age bands: <1, 1-4, 5-9, 10-15,16-64, 65-74, 75-84, 85+;
- Sex based on SEX as 1, 2 (male and female);
- Method of admission of discharge spell based on ADMIMETH as elective or non-elective;
- Medical or Surgical specialties based on TRETSPEF;

Then either:

- Diagnosis group (within medical specialties) based on DIAG_01 (primary diagnosis) and expressed to 3 characters OR;
- Procedure group (within surgical specialties) based on OPERTN_01 (primary procedure) expressed to 3 characters.

For each group in this casemix the casemix specific readmission rates are calculated and are then applied to the casemix structure of the subject population i.e. each CCG. This gives an expected number of events against which the observed number of events may be compared.

Indirect standardisation involves the calculation of the ratio of observed number of events (for the CCG) and the number of events that would be expected if it had experienced the same event rates as those of patients in England, given the casemix of age, sex, method of admission and diagnosis / procedure of its patients.

\[
IS_{Ratio} = \frac{O}{E} \times 100 = \frac{\sum_i O_i}{\sum_i E_i} \times 100 = \frac{\sum_i O_i}{\sum_i n_i \lambda_i} \times 100
\]

(expressed per 100 denominator population)

where:
- \(O_i\) is the observed number of events in the subject population in casemix group \(i\).
- \(E_i\) is the expected number of events in the subject population in casemix group \(i\).
- \(n_i\) is the number of individuals in the subject population in casemix group \(i\).
- \(\lambda_i\) is the crude age-specific rate in the standard population in casemix group \(i\).

This standardised ratio is then converted into a rate by multiplying it by the overall event rate of patients in England.

\[
IS_{Rate} = \frac{O}{E} \times \lambda \times 100 = \frac{\sum_i O_i}{\sum_i E_i} \times \lambda \times 100 = \frac{\sum_i O_i}{\sum_i n_i \lambda_i} \times \lambda \times 100
\]

(expressed per 100 denominator population)

where:
- \(O_i\) is the observed number of events in the subject population in casemix group \(i\).
- \(E_i\) is the expected number of events in the subject population in casemix group \(i\).
- \(n_i\) is the number of individuals in the subject population in casemix group \(i\).
\( \lambda_i \) is the crude age-specific rate in the standard population in casemix group \( i \).

\( \lambda \) is the overall crude rate in the standard population.

**Confidence Intervals**

The lower and upper limits of the 95% confidence interval for the indirectly standardised rate are calculated by finding the lower and upper limits of the standardised ratio and multiplying by the overall crude rate of the standard population. The Byar’s approximation is used as it is a sufficiently accurate approximation to the Poisson probabilities\(^5\).

The 95% limits are given by:

\[
IS_{Rate\ (LL)} = \frac{O}{E} \times \left( 1 - \frac{1}{9O} - \frac{1.96}{\sqrt{O + 1}} \right)^3 \times \lambda \times 100
\]

\[
IS_{Rate\ (UL)} = \frac{(O + 1)}{E} \times \left( 1 - \frac{1}{9(O + 1)} + \frac{1.96}{\sqrt{(O + 1)}} \right)^3 \times \lambda \times 100
\]

(expressed per 100 denominator population)

where:

- \( O \) is the total observed number of events in the subject population.
- \( E \) is the total expected number of events in the subject population.
- \( \lambda \) is the overall crude rate in the standard population.

**Presentation**

**Breakdowns**

**Time periods**

Annual data from 2013/14 for England

**Demographic**

Gender (male and female)

Persons by deprivation quintile

**Geographic**

Persons at England level, by local authority and region

**Disclosure control**

No data are currently suppressed in the file. Values based on counts of between 1 and 7 would be suppressed in line with the HES suppression method if they occurred.\(^5\)

---

### Excel and CSV output

<table>
<thead>
<tr>
<th>Column name</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year</td>
<td>Financial year</td>
</tr>
<tr>
<td>Period of coverage</td>
<td>Actual time period the data cover</td>
</tr>
<tr>
<td>Breakdown</td>
<td>England, gender, lower tier local authority, region, deprivation quintile</td>
</tr>
<tr>
<td>Level</td>
<td>Detailed breakdown of each split (see breakdown) – breakdown code</td>
</tr>
<tr>
<td>Level description</td>
<td>Detailed breakdown of each split (see breakdown) – breakdown description</td>
</tr>
<tr>
<td>Indicator value</td>
<td>Indirectly standardised percentage</td>
</tr>
<tr>
<td>Lower CI</td>
<td>Lower limit of 95% confidence interval</td>
</tr>
<tr>
<td>Upper CI</td>
<td>Upper limit of 95% confidence interval</td>
</tr>
<tr>
<td>Numerator</td>
<td>Number of observed events</td>
</tr>
<tr>
<td>Denominator</td>
<td>All hospital admissions matching criteria</td>
</tr>
<tr>
<td>Expected</td>
<td>Number of expected events</td>
</tr>
</tbody>
</table>
3.2 Emergency admissions for children with lower respiratory tract infections (LRTIs)

Indicator assurance

<table>
<thead>
<tr>
<th>Status</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methodology Review Group (MRG) recommended</td>
<td>April 2012</td>
</tr>
<tr>
<td>Indicator Governance Board (IGB) assured</td>
<td>Not yet assured</td>
</tr>
</tbody>
</table>

Overview

Indicator title

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

Indicator family name

NHS Outcomes Framework: Domain 3: Helping people to recover from episodes of ill health or following injury
Improvement area – Preventing lower respiratory tract infections (LRTIs) in children from becoming more serious

Outcome sought

Preventing lower respiratory tract infections in children from becoming more serious.

Detailed Descriptor

Plain English description

This indicator measures the number of times that children (0 to 18 years) are admitted to hospital in an emergency for certain respiratory infections (bronchiolitis, bronchopneumonia and pneumonia).

Technical description

Emergency admissions to hospital of children with selected types of lower respiratory tract infections (bronchiolitis, bronchopneumonia and pneumonia). It is expressed as the indirectly standardised rate of admissions per 100,000 population aged under 19 (0 to 18 years).
Data sources

Denominator:

Numerator:
Hospital Episode Statistics (HES) Admitted Patient Care (APC), provided by NHS Digital – National Statistics. Final annual HES data are usually released in the November following the financial year-end.

Construction

Calculation methodology

Introduction
This indicator measures the rate of emergency hospital admissions per 100,000 population for patients with LRTIs. The numerator is given by the number of finished and unfinished admission episodes, excluding transfers, for patients under 19 years with a primary diagnosis of an LRTI as detailed below. A data period of three months is used to produce each of the quarterly outputs. The rate is indirectly standardised by age and gender to the reference year 2012/13.

Data Filters

See appendix 2 for descriptions of the conditions included in indicator 3.2.

The data fields and filters that are used are as follows. Details of HES fields and classifications are available in the HES Data Dictionary: https://digital.nhs.uk/data-and-information/data-tools-and-services/data-services/hospital-episode-statistics/hospital-episode-statistics-data-dictionary

1. Field Name: DIAG_3_01, DIAG_4_01
   Conditions: DIAG_3_01 is equal to any of: J12, J13, J14, J15, J16, J21
               OR
               DIAG_4_01 is equal to any of: J100, J110, J111, J180, J181, J189
   Rationale: These fields give the primary diagnosis of the patient in the episode of interest.

2. Field Name: STARTAGE
NHS Outcomes Framework: 3.2 – Emergency admissions for children with lower respiratory tract infections (LTRIs)

1. Field Name: **ADMIMETH**

**Conditions:** Is equal to any of the following: 21, 22, 23, 24, 25, 28, 2A, 2B, 2C or 2D

(25, 2A, 2B, 2C and 2D are valid from April 2013 and replace 28)

**Rationale:** This restricts the data to emergency admissions only.

2. Field Name: **EPISTAT**

**Conditions:** Is equal to either of: 1 or 3

**Rationale:** This includes both finished and unfinished hospital episodes.

3. Field Name: **ADMIDATE**

**Conditions:** Limited to admissions within the current financial year split by quarter.
- Quarter 1: 1st April to 30th June;
- Quarter 2: 1st July to 30th September;
- Quarter 3: 1st October to 31st December;
- Quarter 4: 1st January to 31st March.

**Rationale:** Data are presented quarterly with an admission date within the quarter of interest.

4. Field Name: **SEX**

**Conditions:** Is equal to either of: 1 or 2

**Rationale:** Data are shown for males and females separately. Data for persons are the sum of males and females and exclude the small number of records where sex was unknown or unspecified.

5. Field Name: **EPIORDER**
Conditions: Is equal to: 1
Rationale: This restricts the data to the first episode in a hospital spell.

8. Field Name: ADMISORC
   Conditions: Is not equal to any of: 51, 52, 53
   Rationale: This excludes transfers.

9. Field Name: EPITYPE
   Conditions: Is equal to: 1
   Rationale: This restricts the data to general episodes (excludes birth, delivery and mental health episodes).

10. Field Name: CLASSPAT
    Conditions: Is equal to: 1
    Rationale: This restricts the data to ordinary admissions (excludes day case, regular day/night attenders and mothers/babies only using delivery facilities).

11. Field Name: RESLADST (2003/04 to 2010/11)
    RESLADST_ONS (2011/12 onwards)
    Conditions: Is equal to a valid English Local Authority or equal to ‘U’
    Rationale: This restricts the data to patients resident in England. ‘U’ represents ‘England unspecified’.

Calculation
Numerator
The number of finished and unfinished admission episodes, excluding transfers, for patients aged under 19 with an emergency method of admission and where a lower respiratory tract infection was the primary diagnosis.
Denominator
Resident population in England aged 0 to 18 inclusive, based on ONS mid-year population estimates (based on the 2011 Census).

Standardised admission ratios (SARs)
Counts by category firstly need to be broken down into age and gender groups. The age groups used for this indicator are single years of age 0 to 18.
The SARs can then be calculated by dividing the sum of the observed number of admissions by the sum of the expected number of admissions for each category and converted into a ratio by multiplying it by 100:

\[
SAR = \frac{O}{E} \times 100 = \frac{\sum O_i}{\sum E_i} \times 100 = \frac{\sum O_i}{\sum n_i \lambda_i} \times 100
\]

where:
- \(O_i\) is the observed number of events in the subject population in age- and gender group \(i\) (i.e. the number of admissions for that group in a given year or quarter)
- \(E_i\) is the expected number of events in the subject population in age- and gender group \(i\), that is, the expected number of events in that age- and gender group if the population in that year/quarter had the same distribution as the reference population (2012). It is calculated by multiplying the number of individuals in that group (\(n_i\)) by the crude age- and gender-specific rate in the reference population (\(\lambda_i\)). This figure is then multiplied by 100 (for presentational purposes):
- \(n_i\) is the number of individuals in the subject population in age- and gender group \(i\) (i.e. the number of individuals in that group in a given year or quarter)
- \(\lambda_i\) is the crude age- and gender specific rate in the standard population in age-and gender group \(i\) (i.e. the crude age- and gender specific rate for that age- and gender group in 2012, which is the reference year)

Indicator value
The indicator value is the indirectly standardised rate (ISR) of admissions per 100,000 population. It is standardised by age and gender to the reference year. The ISR is calculated using the crude rate of admissions for England for the reference year, multiplied by the SAR for the category, and multiplied by 1,000 to get a rate per 100,000 population. (Note that the SAR is expressed as a ratio, therefore the raw rate has already been multiplied by 100).

SAR Confidence Intervals
When calculating 95% confidence intervals for indirectly standardised ratios, it is assumed that the standard rates come from a population sufficiently large as to assume their sampling variance is negligible, and that the observed number of events \(O\) follows a Poisson
distribution. Where the number of observed events is less than 500, the exact upper and lower limits for O are found from a look-up table and used to calculate the respective limits of the ratio. Where the number of observed events is 500 or more, confidence intervals are calculated using the method described by Goldblatt and Jones\(^6\). The lower and upper confidence limits for the SAR are denoted by SAR\(_{LL}\) and SAR\(_{UL}\).

**For O < 500:**

\[
\text{SAR\(_{LL}\)} = \frac{O - 1.96\sqrt{O\times0.11}}{E} \times 100
\]

\[
\text{SAR\(_{UL}\)} = \frac{O + 1.96\sqrt{O\times0.96}}{E} \times 100
\]

where:
- OLL/UL are the exact lower and upper 95% confidence limits from a standard Poisson distribution table for the total number of observed events O in the subject population.
- E is the total expected number of events in the subject population.

**For O >= 500 and <900:**

\[
\text{SAR\(_{LL}\)} = \frac{0.96 + O - 1.96\sqrt{O + 0.11}}{E} \times 100
\]

\[
\text{SAR\(_{UL}\)} = \frac{1.94 + O + 1.96\sqrt{O + 0.96}}{E} \times 100
\]

**For O >= 900:**

\[
\text{SAR\(_{LL}\)} = \frac{0.962 + O - 1.9602\sqrt{O}}{E} \times 100
\]

\[
\text{SAR\(_{UL}\)} = \frac{1.94 + O + 1.96\sqrt{O + 0.96}}{E} \times 100
\]

**ISR Confidence Intervals**

The indirectly standardised rate upper and lower confidence intervals are calculated by multiplying the SAR upper and lower limits by the crude rate for the reference year.

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Deprivation breakdown

The deprivation breakdowns for this indicator have been derived using Index of Multiple Deprivation (IMD) 2015 and 2019 scores (year dependent) based on 2011 lower super output area (LSOA) boundaries. These are published by the Ministry of Housing, Communities & Local Government (MHCLG)


Presentation

Breakdowns

Time periods

Quarterly and annual data from 2003/04 Q1 for all breakdowns

Demographic

Gender - male and female

Age – person by 1-year age band

Geographic

Lower tier local authority, upper tier local authority and region

Other

Deprivation decile – person

Condition – person (a list of conditions for indicator 3.2 can be found in appendix 2)

Disclosure control

This indicator is calculated using HES data, following the HES Analysis Guide on suppression of small numbers. For 2017/18 data, new HES disclosure rules have been applied. For the Lower and Upper Tier Local Authority and Region breakdowns values based on counts between 1 and 7 are suppressed. All other values in the 'Observed' column are rounded to the nearest 5. Secondary suppression is not necessary using this method. Between 2013/14 and 2016/17 for the same breakdowns values based on counts between 1 and 5 were suppressed. Secondary suppression is then applied so that at least two sets of quarterly values are suppressed for each year and so that two sets of values are suppressed in each upper tier or region, where necessary. Prior to 2013/14 the same primary suppression was applied as for 2013/14 to 2016/17. Secondary suppression was applied so that at least 2 quarterly values were suppressed in each year. If only one local authority in a region was suppressed the regional value was also suppressed.

ONS population data were used for the denominator; the values were rounded to the nearest 100. The rounding was carried out after the indicator value was calculated.
## Excel and CSV output

<table>
<thead>
<tr>
<th>Column name</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year</td>
<td>Financial year</td>
</tr>
<tr>
<td>Quarter</td>
<td>Annual, quarter</td>
</tr>
<tr>
<td>Period of coverage</td>
<td>Actual time period the data cover</td>
</tr>
<tr>
<td>Breakdown</td>
<td>England, gender, age band, lower and upper tier local authority, region, deprivation decile, condition</td>
</tr>
<tr>
<td>Level</td>
<td>Detailed breakdown of each split - breakdown code</td>
</tr>
<tr>
<td>Level description</td>
<td>Further description of level/breakdown</td>
</tr>
<tr>
<td>Indicator value</td>
<td>Indirectly standardised rate (ISR) per 100,000 population</td>
</tr>
<tr>
<td>Lower CI</td>
<td>ISR lower 95% confidence interval</td>
</tr>
<tr>
<td>Upper CI</td>
<td>ISR upper 95% confidence interval</td>
</tr>
<tr>
<td>Standardised ratio</td>
<td>Standardised admission ratio</td>
</tr>
<tr>
<td>Standardised ratio lower CI</td>
<td>Standardised admission ratio lower confidence interval</td>
</tr>
<tr>
<td>Standardised ratio upper CI</td>
<td>Standardised admission ratio upper confidence interval</td>
</tr>
<tr>
<td>Observed</td>
<td>Number of observed events (numerator)</td>
</tr>
<tr>
<td>Population</td>
<td>Population count (denominator)</td>
</tr>
<tr>
<td>Expected</td>
<td>Number of expected events</td>
</tr>
<tr>
<td>Percent unclassified</td>
<td>The percentage of records where there is no LSOA or LA code recorded – displayed for lower and upper tier local authority, region and deprivation decile breakdowns</td>
</tr>
</tbody>
</table>
3.5.i Hip fracture: Proportion of patients recovering to their previous levels of mobility/walking ability at 30 days

Indicator assurance

<table>
<thead>
<tr>
<th>Status</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methodology Review Group (MRG) recommended</td>
<td>November 2012</td>
</tr>
<tr>
<td>Indicator Governance Board (IGB) assured</td>
<td>November 2012</td>
</tr>
</tbody>
</table>

Overview

Indicator title
3.5.i Hip fracture: Proportion of patients recovering to their previous levels of mobility/walking ability at 30 days

Indicator family name
NHS Outcomes Framework – Domain 3: Helping people to recover from episodes of ill health or following injury
Improvement area – Improving recovery from fragility fractures

Outcome sought
Effective recovery of mobility following a hip fracture.

Detailed Descriptor

Plain English description
This indicator measures the proportion of patients with a hip fracture resulting from a fall from standing height or less that would not ordinarily cause a fracture in a normal adult (a fragility fracture) recovering to their previous levels of mobility at 30 days after admission to hospital.

Technical description
The proportion of patients, expressed as a percentage, with a hip fracture recovering to their previous levels of mobility at 30 days after admission.
NHS Outcomes Framework: 3.5.i – Hip fracture: Proportion of patients recovering to their previous levels of mobility/walking ability at 30 days

Data sources

Denominator and numerator:
National Hip Fracture Database (NHFD). (Source provider: Health Quality Improvement Partnership).

Further information about the NHFD can be found on their website and annual report at the below link:
http://www.nhfd.co.uk/

Construction

Calculation methodology

Introduction
This indicator measures the proportion of patients recovering to a level of mobility at 30 days no more than 1 category lower than their mobility score prior to the hip fracture.

There are five mobility categories within the NHFD. Patients within the NHFD have their mobility status categorised according to the algorithm outlined below. The indicator only includes patients with a pre fracture mobility score in either category 1, 2 or 3. This is because any patient in either category 4 or 5 cannot fall more than 1 mobility category and therefore will always be determined to have recovered.

<table>
<thead>
<tr>
<th>Mobility category</th>
<th>Mobility category description</th>
<th>Definition as per NHFD data fields</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Regularly mobile outdoors without aids (or assistance)</td>
<td>Walking ability outdoors = ‘Regularly walked without aids’ AND Accompanied to walk outdoors = ‘No’</td>
</tr>
<tr>
<td>2</td>
<td>Mobile outdoors with only one aid</td>
<td>Walking ability outdoors = ‘Regularly walked with one aid’ AND Accompanied to walk outdoors = ‘No’</td>
</tr>
<tr>
<td>3</td>
<td>Mobile outdoors with two aids or a frame</td>
<td>Walking ability outdoors = ‘Regularly walked with two aids or frame’ AND Accompanied to walk outdoors = ‘No’</td>
</tr>
<tr>
<td>4</td>
<td>Indoor mobility only, but never goes out unassisted</td>
<td>Walking ability indoors IN (‘Regularly walked without aids’, ‘Regularly walked with one aid’, ‘Regularly walked with two aids or frame’) AND (Walking ability outdoors IN (‘Electric buggy’, ‘Wheelchair or bed bound’, ‘Never goes outdoors’) OR Accompanied to walk outdoors = ‘Yes’)</td>
</tr>
</tbody>
</table>
NHS Outcomes Framework: 3.5.i – Hip fracture: Proportion of patients recovering to their previous levels of mobility/walking ability at 30 days

<table>
<thead>
<tr>
<th></th>
<th>No functional mobility (wheelchair or assisted transfers or bedbound)</th>
<th>Walking ability indoors = 'Wheelchair or bedbound' AND Walking ability outdoors IN ('Electric buggy', 'Wheelchair or bed bound', 'Never goes outdoors')</th>
</tr>
</thead>
</table>

Data filters

1. **Field:** Age
   - **Conditions:** Between 60 and 110
   - **Rationale:** Restricts the data to patients aged 60 to 110 years inclusive.

2. **Field:** Hospital admission date
   - **Conditions:** Between 1 January and 31 December inclusive for the year being reported
   - **Rationale:** Selects only those admitted during the relevant calendar year.

3. **Field:** Pre-fracture mobility category
   - **Conditions:** Equal to 1, 2 or 3
   - **Rationale:** Excludes patients whose pre-fracture mobility was classified as category 4 or 5, or patients who have no pre-fracture mobility category recorded.

4. **Field:** Mobility category 30 days post admission
   - **Conditions:** Is not NULL
   - **Rationale:** Excludes records where the mobility category 30 days post admission was not recorded.

Calculation

The indicator value is presented as a simple percentage.

Denominator

Number of admitted patients with a pre-fracture mobility score of 1, 2 or 3 recorded at admission, and a valid mobility score recorded at 30 days.
NHS Outcomes Framework: 3.5.i – Hip fracture: Proportion of patients recovering to their previous levels of mobility/walking ability at 30 days

Numerator
Number of admitted patients with a pre-fracture mobility score of 1, 2 or 3 recorded at admission, and a valid mobility score recorded at 30 days which was either lower (i.e. better), the same or only one mobility category higher than mobility category at admission.

The indicator values were provided pre-calculated by the Clinical Effectiveness Unit at the Royal College of Surgeons. The National Hip Fracture Database (NHFD) is commissioned by the Healthcare Quality Improvement Partnership (HQIP) and managed by the Royal College of Physicians (RCP) as part of the Falls and Fragility Fracture Audit Programme (FFFAP).

Percentage calculation
The indicator value is calculated as follows:

\[ p = \frac{O}{n} \times 100 \]

where:
- \( O \) is the observed number of individuals in the sample (numerator);
- \( n \) is the total number of individuals in the sample (denominator).

Confidence Intervals
95% confidence intervals are calculated based on the Wilson Score method\(^7\)\(^8\) using the following formulae:

\[ p_{\text{lower}} = \frac{2O + z^2 - z\sqrt{z^2 + 4Oq}}{2(n + z^2)} \]

\[ p_{\text{upper}} = \frac{2O + z^2 + z\sqrt{z^2 + 4Oq}}{2(n + z^2)} \]

where:
- \( q \) is \( 1 - \frac{p}{100} \);
- \( O \) is the observed number of individuals in the sample (numerator);
- \( n \) is the total number of individuals in the sample (denominator);

---


z is the 97.5\textsuperscript{th} percentile value from the Standard Normal distribution (for a 95% confidence interval $z = 1.96$ (rounded)).

**Presentation**

**Breakdowns**

**Time periods**

Annual data from 2011 for England

**Demographic**

Persons by mobility category from 2011

Persons by age and gender from 2012

Persons by deprivation quintile from 2015;

(quintile 1 = most deprived, quintile 5 = least deprived)

**Geographic**

Persons by lower tier local authority, region and provider hospital from 2013

**Disclosure control**

All indicator values, numerators and denominators have been suppressed where the numerator and/or denominator had a value between 1 and 5 (inclusive).

**Excel and CSV output**

<table>
<thead>
<tr>
<th>Column name</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year</td>
<td>Calendar year</td>
</tr>
<tr>
<td>Period of coverage</td>
<td>01/01 to 31/12 of the respective calendar year</td>
</tr>
<tr>
<td>Breakdown</td>
<td>England, gender, age, mobility category at admission, deprivation quintile, lower tier local authority, region and provider hospital</td>
</tr>
<tr>
<td>Level</td>
<td>More detailed description of breakdown</td>
</tr>
<tr>
<td>Indicator value</td>
<td>Percentage of admitted patients whose mobility category at 30 days was lower (i.e. better), the same or only one mobility category higher (i.e. worse) than the mobility category at admission</td>
</tr>
<tr>
<td>Lower CI</td>
<td>95% lower confidence limit</td>
</tr>
<tr>
<td>Upper CI</td>
<td>95% upper confidence limit</td>
</tr>
<tr>
<td>Count of patients who recovered (numerator)</td>
<td>Number of patients in the extract whose mobility category at 30 days was lower (i.e. better), the same or only one mobility category higher (i.e. worse) than the mobility category at admission</td>
</tr>
</tbody>
</table>
NHS Outcomes Framework: 3.5.i – Hip fracture: Proportion of patients recovering to their previous levels of mobility/walking ability at 30 days

| Count of patients (denominator) | Number of admitted patients with a mobility score of 1, 2, or 3 recorded at admission, and a mobility score recorded at 30 days |
3.5.ii Hip fracture: Proportion of patients recovering to their previous levels of mobility/walking ability at 120 days

Indicator assurance

<table>
<thead>
<tr>
<th>Status</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methodology Review Group (MRG) recommended</td>
<td>November 2012</td>
</tr>
<tr>
<td>Indicator Governance Board (IGB) assured</td>
<td>November 2012</td>
</tr>
</tbody>
</table>

Overview

Indicator title
3.5.ii Hip fracture: Proportion of patients recovering to their previous levels of mobility/walking ability at 120 days

Indicator family name
NHS Outcomes Framework – Domain 3: Helping people to recover from episodes of ill health or following injury
Improvement area – Improving recovery from fragility fractures

Outcome sought
Effective recovery of mobility following a hip fracture.

Detailed Descriptor
Plain English description
This indicator measures the proportion of patients with a hip fracture resulting from a fall from standing height or less that would not ordinarily cause a fracture in a normal adult (a fragility fracture) recovering to their previous levels of mobility at 120 days after admission to hospital.

Technical description
The proportion of patients, expressed as a percentage, with a hip fracture recovering to their previous levels of mobility at 120 days after admission.
NHS Outcomes Framework: 3.5.ii – Hip fracture: Proportion of patients recovering to their previous levels of mobility/walking ability at 120 days

Data sources

Denominator and numerator:
National Hip Fracture Database (NHFD). (Source provider: Health Quality Improvement Partnership).

Further information about the NHFD can be found on their website and annual report at the below link:
http://www.nhfd.co.uk/

Construction

Calculation methodology

Introduction

This indicator measures the proportion of patients recovering to a level of mobility at 120 days no more than 1 category lower than their mobility score prior to the hip fracture.

There are five mobility categories within the NHFD. Patients within the NHFD have their mobility status categorised according to the algorithm outlined below. The indicator only includes patients with a pre fracture mobility score in either category 1, 2 or 3. This is because any patient in either category 4 or 5 cannot fall more than 1 mobility category and therefore will always be determined to have recovered.

<table>
<thead>
<tr>
<th>Mobility category</th>
<th>Mobility category description</th>
<th>Definition as per NHFD data fields</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Regularly mobile outdoors without aids (or assistance)</td>
<td>Walking ability outdoors = ‘Regularly walked without aids’ AND Accompanied to walk outdoors = ‘No’</td>
</tr>
<tr>
<td>2</td>
<td>Mobile outdoors with only one aid</td>
<td>Walking ability outdoors = ‘Regularly walked with one aid’ AND Accompanied to walk outdoors = ‘No’</td>
</tr>
<tr>
<td>3</td>
<td>Mobile outdoors with two aids or a frame</td>
<td>Walking ability outdoors = ‘Regularly walked with two aids or frame’ AND Accompanied to walk outdoors = ‘No’</td>
</tr>
<tr>
<td>4</td>
<td>Indoor mobility only, but never goes out unassisted</td>
<td>Walking ability indoors IN (‘Regularly walked without aids’, ‘Regularly walked with one aid’, ‘Regularly walked with two aids or frame’) AND (Walking ability outdoors IN (‘Electric buggy’, ‘Wheelchair or bed bound’, ‘Never goes outdoors’) OR Accompanied to walk outdoors = ‘Yes’)</td>
</tr>
</tbody>
</table>
NHS Outcomes Framework: 3.5.ii – Hip fracture: Proportion of patients recovering to their previous levels of mobility/walking ability at 120 days

| 5 | No functional mobility (wheelchair or assisted transfers or bedbound) | Walking ability indoors = ‘Wheelchair or bedbound’ AND Walking ability outdoors IN (‘Electric buggy’, ‘Wheelchair or bed bound’, ‘Never goes outdoors’) |

Data filters

1. Field: Age
   Conditions: Between 60 and 110
   Rationale: Restricts the data to patients aged 60 to 110 years inclusive.

2. Field: Hospital admission date
   Conditions: Between 1 January and 31 December inclusive for the year being reported
   Rationale: Selects only those admitted during the relevant calendar year.

3. Field: Pre-fracture mobility category
   Conditions: Equal to 1, 2 or 3
   Rationale: Excludes patients whose pre-fracture mobility was classified as category 4 or 5, or patients who have no pre-fracture mobility category recorded.

4. Field: Mobility category 120 days post admission
   Conditions: Is not NULL
   Rationale: Excludes records where the mobility category 120 days post admission was not recorded.

Calculation
The indicator value is presented as a simple percentage.

Denominator
Number of admitted patients with a pre-fracture mobility score of 1, 2 or 3 recorded at admission, and a valid mobility score recorded at 120 days.
NHS Outcomes Framework: 3.5.ii – Hip fracture: Proportion of patients recovering to their previous levels of mobility/walking ability at 120 days

Numerator

Number of admitted patients with a pre-fracture mobility score of 1, 2 or 3 recorded at admission, and a valid mobility score recorded at 120 days which was either lower (i.e. better), the same or only one mobility category higher than mobility category at admission.

The indicator values were provided pre-calculated by the Clinical Effectiveness Unit at the Royal College of Surgeons. The National Hip Fracture Database (NHFD) is commissioned by the Healthcare Quality Improvement Partnership (HQIP) and managed by the Royal College of Physicians (RCP) as part of the Falls and Fragility Fracture Audit Programme (FFFAP).

Percentage calculation

The indicator value is calculated as follows:

\[ p = \frac{O}{n} \times 100 \]

where:
- \( O \) is the observed number of individuals in the sample (numerator);
- \( n \) is the total number of individuals in the sample (denominator).

Confidence Intervals

95% confidence intervals are calculated based on the Wilson Score method\(^9\)\(^{10}\) using the following formulae:

\[ P_{\text{LOWER}} = \frac{2O + z^2 - z\sqrt{z^2 + 4Oq}}{2(n + z^2)} \]

\[ P_{\text{UPPER}} = \frac{2O + z^2 + z\sqrt{z^2 + 4Oq}}{2(n + z^2)} \]

where:
- \( q \) is 1 – (\( p \)/100);
- \( O \) is the observed number of individuals in the sample (numerator);
- \( n \) is the total number of individuals in the sample (denominator);
- \( z \) is the 97.5\(^{th}\) percentile value from the Standard Normal distribution (for a 95% confidence interval \( z = 1.96 \) (rounded)).


**Presentation**

**Breakdowns**

**Time periods**

Annual data from 2011 for England

**Demographic**

Persons by mobility category from 2011
Persons by age and gender from 2012
Persons by deprivation quintile from 2015;
(quintile 1 = most deprived, quintile 5 = least deprived)

**Geographic**

Persons by lower tier local authority, region and provider hospital from 2013

**Disclosure control**

All indicator values, numerators and denominators have been suppressed where the numerator and/or denominator had a value between 1 and 5 (inclusive).

**Excel and CSV output**

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<thead>
<tr>
<th>Column name</th>
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<td>More detailed description of breakdown</td>
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<tr>
<td>Indicator value</td>
<td>Percentage of admitted patients whose mobility category at 120 days was lower (i.e. better), the same or only one mobility category higher (i.e. worse) than the mobility category at admission</td>
</tr>
<tr>
<td>Lower CI</td>
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<td>Upper CI</td>
<td>95% upper confidence limit</td>
</tr>
<tr>
<td>Count of patients who recovered</td>
<td>Number of patients in the extract whose mobility category at 120 days was lower (i.e. better), the same or only one mobility category higher (i.e. worse) than the mobility category at admission</td>
</tr>
<tr>
<td>(numerator)</td>
<td></td>
</tr>
<tr>
<td>Count of patients</td>
<td>Number of admitted patients with a mobility score of 1,2, or 3 recorded at admission, and a mobility score recorded at 120 days</td>
</tr>
<tr>
<td>(denominator)</td>
<td></td>
</tr>
</tbody>
</table>
NHS Outcomes Framework: 3.5.ii – Hip fracture: Proportion of patients recovering to their previous levels of mobility/walking ability at 120 days
3.6.i Proportion of older people (65 and over) who were still at home 91 days after discharge from hospital into reablement/rehabilitation service

Indicator assurance

<table>
<thead>
<tr>
<th>Status</th>
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</thead>
<tbody>
<tr>
<td>Methodology Review Group (MRG) recommended</td>
<td>October 2012</td>
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<tr>
<td>Indicator Governance Board (IGB) assured</td>
<td>November 2012</td>
</tr>
</tbody>
</table>

Overview

Indicator title
3.6.i Proportion of older people (65 and over) who were still at home 91 days after discharge from hospital into reablement/rehabilitation service

Indicator family name
NHS Outcomes Framework – Domain 3: Helping people to recover from episodes of ill health or following injury

Improvement area – Helping older people to recover their independence after illness or injury

Outcome sought
Helping older people to recover their independence after illness or injury.

Detailed Descriptor

Plain English description
This indicator measures the proportion, expressed as a percentage, of older people aged 65 and over who, after a period of reablement/rehabilitation, maintain their independence by remaining or returning to their home or previous residence 91 days after leaving hospital.

Reablement/rehabilitation services are focused on improving people’s health, well-being, confidence and independence after an acute episode of ill health, injury or a gradual decline in functioning in the community. They include all episodes of support provided that are intended to be time limited and aim at maximising the independence of the individual and reducing/eliminating their need for on-going support.

Technical description
The proportion, expressed as a percentage, of older people aged 65 and over discharged from hospital to their own home or to a residential or nursing care home or extra care
housing for rehabilitation, with a clear intention that they will move on/back to their own home (including a place in extra care housing or an adult placement scheme setting), who are at home or in extra care housing or an adult placement scheme setting 91 days after the date of their discharge from hospital.

Alignment with other Outcomes Frameworks
Shared with Adult Social Care Outcomes Framework (ASCOF) Indicator 2B (1).

Data sources

Numerator and Denominator:
Adult Social Care Outcomes Framework (ASCOF) Indicator 2B (1) which is derived from the Short and Long-Term data return (SALT). Both managed by NHS Digital - Official Statistics. Published approximately 6 months after the end of the financial year.

Construction

Calculation methodology
Introduction
This indicator measures the benefit to individuals from reablement, intermediate care and rehabilitation following a hospital episode, by determining whether an individual remains living at home 91 days following discharge – the key outcome for many people using reablement services.

This is a two-part measure which reflects both the effectiveness of reablement services (part 1; NHSOF 3.6.i), and the coverage of the service (part 2; NHSOF 3.6.ii).

The two parts of the indicator are:

i) the percentage of older people (65 and over) who were still at home 91 days after discharge from hospital into rehabilitation services and,

ii) the percentage of older people aged 65 and over offered rehabilitation services following discharge from acute or community hospital.

The first part of the measure refers to the proportion, expressed as a percentage, of people aged 65 and over discharged from hospital to their own home or to a residential or nursing care home or extra care housing for rehabilitation with a clear intention that they will move on/back to their own home (including a place in extra care housing or an adult placement scheme setting) who are at home (or in extra care housing or an adult placement scheme setting) three months after the date of their discharge from hospital.
**Calculation**

The ASCOF Handbook of definitions provides a guide to methodology, available at:

The methodology for this indicator is discussed under 2B (1) Proportion of older people (65 and over) who were still at home 91 days after discharge from hospital into reablement/rehabilitation services.

**Presentation**

**Breakdowns**

**Time periods**

Annual data for England (financial year) from 2011/12 onwards

**Demographic**

All persons, males and females aged 65 and over

Persons by age group (65 to 74, 75 to 84, 85 and over)

**Geographic**

Upper tier local authority

Region

**Disclosure control**

Data up to 2013/14 are rounded to the nearest 5 and suppressed where values are small (0, 1 or 2). Where numerators and denominators are small, the indicator values are also suppressed. Following a disclosure control review, data from 2014/15 onwards are presented unrounded and unsuppressed.
Excel and CSV output

<table>
<thead>
<tr>
<th>Column name</th>
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</thead>
<tbody>
<tr>
<td>Year</td>
<td>Respective financial year</td>
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<td>Period of coverage</td>
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<tr>
<td>Breakdown</td>
<td>England, gender, age, upper tier local authority, region</td>
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<tr>
<td>Level</td>
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</tr>
<tr>
<td>Level description</td>
<td>Description of more detailed breakdown</td>
</tr>
<tr>
<td>Gender</td>
<td>Person, male, female</td>
</tr>
<tr>
<td>Indicator value</td>
<td>Number of older people (aged 65 and over) discharged from acute or community hospitals from hospital to their own home or to a residential or nursing care home or extra care housing for rehabilitation, with the clear intention that they will move on/back to their own home (including a place in extra care housing or an adult placement scheme setting) as a percentage of the total number of people (aged 65 and over) discharged alive from hospitals in England.</td>
</tr>
<tr>
<td>Numerator</td>
<td>Number of older people (aged 65 and over) discharged from acute or community hospitals to their own home or to a residential or nursing care home or extra care housing for rehabilitation, with a clear intention that they will move on/back to their own home (including a place in extra care housing or an adult placement scheme setting), who are at home or in extra care housing or an adult placement scheme setting 91 days after the date of their discharge from hospital.</td>
</tr>
<tr>
<td>Denominator</td>
<td>Number of older people (aged 65 and over) discharged from acute or community hospitals from hospital to their own home or to a residential or nursing care home or extra care housing for rehabilitation, with the clear intention that they will move on/back to their own home (including a place in extra care housing or an adult placement scheme setting).</td>
</tr>
</tbody>
</table>
3.6.ii Proportion offered rehabilitation following discharge from acute or community hospital

Indicator assurance

<table>
<thead>
<tr>
<th>Status</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methodology Review Group (MRG) recommended</td>
<td>October 2012</td>
</tr>
<tr>
<td>Indicator Governance Board (IGB) assured</td>
<td>November 2012</td>
</tr>
</tbody>
</table>

Overview

Indicator title
3.6.ii Proportion offered rehabilitation following discharge from acute or community hospital

Indicator family name
NHS Outcomes Framework – Domain 3: Helping people to recover from episodes of ill health or following injury

Improvement area – Helping older people to recover their independence after illness or injury

Outcome sought
Helping older people to recover their independence after illness or injury.

Detailed Descriptor

Plain English description
This indicator measures the proportion, expressed as a percentage, of older people aged 65 and over who are offered reablement services when they leave hospital.

Reablement/rehabilitation services are focused on improving people’s health, well-being, confidence and independence after an acute episode of ill health, injury or a gradual decline in functioning in the community. They include all episodes of support provided that are intended to be time limited and aim at maximising the independence of the individual and reducing/eliminating their need for on-going support.

Technical description
The proportion, expressed as a percentage, of older people aged 65 and over offered reablement services following discharge from hospital.
Alignment with other Outcomes Frameworks
Shared with Adult Social Care Outcomes Framework Indicator 2B (2).

Data sources

Numerator:
Adult Social Care Outcomes Framework (ASCOF) Indicator 2B (2) which is derived from the Short and Long-Term return (SALT). Both managed by NHS Digital - Official Statistics. Published approximately 6 months after the end of the financial year.

Denominator:
Hospital Episode Statistics (HES) bespoke extract from NHS Digital. These data are provisional.

Construction

Calculation methodology

Introduction
This indicator measures the coverage of reablement services following a hospital episode, by determining the proportion of older people aged 65 and over who were offered rehabilitation services following discharge from acute or community hospital.

This is a two-part measure which reflects both the effectiveness of reablement services (part 1; NHSOF 3.6.i), and the coverage of the service (part 2; NHSOF 3.6.ii).

The two parts of the indicator are:

i) the percentage of older people (65 and over) who were still at home 91 days after discharge from hospital into rehabilitation services and,

ii) the percentage of older people (aged 65 and over) offered rehabilitation services following discharge from acute or community hospital.

The second part of the measure refers to the proportion expressed as a percentage, of people aged 65 and over who were offered rehabilitation services following discharge from acute or community hospital.

Calculation
The ASCOF Handbook of definitions provides a guide to methodology, available at:
NHS Outcomes Framework: 3.6.ii – Proportion offered rehabilitation following discharge from acute or community hospital

The methodology for this indicator is discussed under 2B (2) Proportion of older people (65 and over) who were still at home 91 days after discharge from hospital into reablement/rehabilitation services.

Presentation

Breakdowns

Time periods

Annual data for England (financial year)

Demographic

All persons, males and females aged 65 and over

Persons by age group (65 to 74, 75 to 84, 85 and over)

Geographic

Upper tier local authority

Region

Disclosure control

Data up to 2013/14 are rounded to the nearest 5 and suppressed where values are small (0, 1 or 2). Where numerators and denominators are small, the indicator values are also suppressed. Following a disclosure control review, data from 2014/15 onwards are presented unrounded and unsuppressed.

Excel and CSV output

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</tr>
<tr>
<td>Gender</td>
<td>Person, male, female</td>
</tr>
<tr>
<td>Indicator value</td>
<td>Number of older people (aged 65 and over) discharged from acute or community hospitals from hospital to their own home or to a residential or nursing care home or extra care housing for rehabilitation, with the clear intention that they will move on/back to their own home (including a place in extra care housing or an adult placement scheme setting) as a percentage of the total</td>
</tr>
<tr>
<td><strong>Numerator</strong></td>
<td>Number of older people (<em>aged 65 and over</em>) discharged from acute or community hospitals from hospital to their own home or to a residential or nursing care home or extra care housing for rehabilitation, with the clear intention that they will move on/back to their own home (including a place in extra care housing or an adult placement scheme setting).</td>
</tr>
<tr>
<td><strong>Denominator</strong></td>
<td>Total number of people (<em>aged 65 and over</em>) discharged alive from hospitals in England between 1 October and 31 December. This includes all specialties and zero-length stays. Data for geographical areas are based on usual residence of patient.</td>
</tr>
</tbody>
</table>
3.7ii Tooth extractions due to decay for children admitted as inpatients to hospital, aged 10 years and under

Indicator assurance

<table>
<thead>
<tr>
<th>Status</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methodology Review Group (MRG) recommended</td>
<td>December 2018</td>
</tr>
<tr>
<td>Indicator Governance Board (IGB) assured</td>
<td>January 2019</td>
</tr>
</tbody>
</table>

Overview

Indicator title
3.7ii – Tooth extractions due to decay for children admitted as inpatients to hospital aged 10 years and under

Indicator family name
NHS Outcomes Framework: Domain 3 – Helping people to recover from episodes of ill health or following injury
Improvement area – Improving dental health

Outcome sought
Reduced hospital admissions for children aged 10 years and under for tooth extractions due to tooth decay.

Detailed Descriptor

Plain English description
The level of hospital inpatient periods of care where a child age 10 years or under had one or more tooth extracted, due to tooth decay.

Technical description
The crude rate of the number of finished consultant episodes (FCEs) where a tooth extraction was performed on a child aged 10 years or under at the start of the episode of care, due to tooth decay, per 100,000 resident population.
Data sources

Numerator:
Hospital Episode Statistics (HES) Admitted Patient Care (APC), provided by NHS Digital – National Statistics. Final annual HES data are usually released in the November following the financial year-end.

Denominator:
Mid-year population estimates for England published by the Office for National Statistics (ONS) – National Statistics. England population estimates are released in June following year end. Population estimates for breakdowns such as Lower Super Output Area (LSOA) are released later.

Construction

Calculation methodology

Introduction
This indicator measures the rate of FCE per 100,000 population for children aged 10 and under with a primary diagnosis of dental caries (tooth decay). It is thought that the majority of these extractions, which take place in hospital and usually under general anaesthetic, could be avoided with better dental care and dentist intervention. In February 2019, the diagnosis codes in DIAG_3_01 for this indicator were aligned with those used by Public Health England to standardise the two similar tooth extraction indicators. This resulted in the addition of several diagnosis codes from K04 as shown below, and the elimination of some dental caries diagnosis codes from the K02 group which alone would not be considered enough to warrant an extraction.

Due to different age groups used in NOF 3.7.ii, the Public Health England indicator is not directly comparable to this indicator.

Data Filters

1. **Field Name:** DIAG_3_01  
   **Description:** Primary diagnosis code consisting of 3 characters  
   **Conditions:** K021, K025, K028, K029, K040, K045, K046, K047  
   **Rationale:** This gives the primary diagnosis of the patient.

2. **Field Name:** STARTAGE  
   **Description:** Age at start of episode
Conditions: Is between (inclusive): 0 and 10
OR
is between 7001 and 7007 (for babies)

Rationale: This field describes the age of the patient at the start of their episode of care. This indicator is limited to children aged 10 and under.

3. Field Name: OPERTN_3_01
Description: Main operative procedure
Conditions: F09 or F10 (surgical / simple removal of tooth)
Rationale: This identifies records where an extraction has taken place

4. Field Name: EPISTAT
Description: Episode status
Conditions: 3
Rationale: This limits to finished hospital episodes.

5. Field Name: SEX
Description: Sex of patient
Conditions: Is equal to either of: 1 or 2
Rationale: Data are shown for males and females separately. Data for persons are the sum of males and females and excludes the small number of records where sex was unknown or unspecified.

6. Field Name: CLASSPAT
Description: Patient classification
Conditions: Is equal to: 1,2,5
Rationale: This restricts the data to ordinary admissions, day case and mothers/babies using only delivery facilities.

7. Field Name: RESLADST (2003/04 to 2010/11)
RESLADST_ONS (2011/12 onwards)
Description: Local authority district
Conditions: Is equal to a valid English Local Authority or equal to 'U'
Rationale: This restricts the data to patients resident in England. ‘U’ represents ‘England unspecified’.
8. **Field Name:** LSOA11  
**Description:** Lower super output area based on the 2011 Census  
**Conditions:** Is equal to a valid English LSOA  
**Rationale:** Lower super output areas (LSOAs) based on the 2011 Census are extracted in order to derive the deprivation decile for the deprivation breakdown.

**Calculation**

**Numerator**
The number of finished consultant episodes for extraction of tooth where the primary diagnosis is dental caries and the patient is aged 10 years or under.

**Denominator**
ONS mid-year population estimates (based on the 2011 Census).

**Crude rate per 100,000 population**
The indicator value is presented as a crude rate per 100,000 population:

\[ r = 100,000 * \frac{O}{n} \]

Where:

- \( r \) = crude rate per 100,000 population
- \( O \) = number of FCEs where extraction performed
- \( n \) = population

**Confidence Intervals for Crude Rates**
95% confidence intervals are calculated using the following methodology:

\[ r_{lower} = \frac{O_{lower}}{n} \]
\[ r_{upper} = \frac{O_{upper}}{n} \]

where:

- \( r \) is the crude rate per 100,000 population and \( r_{lower} \) and \( r_{upper} \) are the lower and upper confidence limits for the crude rate;
- \( O \) is the number of FCEs where extraction performed and \( O_{lower} \) and \( O_{upper} \) are the lower and upper confidence limits for the number of tooth extractions;
- \( n \) is the number of individuals in the subject population.
The confidence limits for the number of tooth extractions are given by the following:

When $O < 389$ then,

$$O_{\text{lower}} = \frac{\chi^2_{\text{lower}}}{2}$$

$$O_{\text{upper}} = \frac{\chi^2_{\text{upper}}}{2}$$

where:

$\chi^2_{\text{lower}}$ is the 97.5th percentile value from the $\chi^2$ distribution with $2O$ degrees of freedom;

$\chi^2_{\text{upper}}$ is the 2.5th percentile value from the $\chi^2$ distribution with $2O+2$ degrees of freedom.

When $O \geq 389$ then,

$$O_{\text{lower}} = O \left(1 - \frac{1}{9O} - \frac{z}{3\sqrt{O}}\right)^3$$

$$O_{\text{upper}} = (O + 1) \left(1 - \frac{1}{9(O + 1)} + \frac{z}{3\sqrt{O + 1}}\right)^3$$

where:

$z$ is the 97.5th percentile value from the Standard Normal distribution.

**Deprivation breakdown**

The deprivation breakdowns for this indicator has been derived using Index of Multiple Deprivation (IMD) 2015 and 2019 scores (year dependent) based on 2011 lower super output area (LSOA) boundaries. These are published by the Ministry of Housing, Communities & Local Government (MHCLG)


**Presentation**

**Breakdowns**

**Time periods**
Annual data from 2011/12 for all breakdowns

**Demographic**
Gender - male and female
Age – person

**Geographic**
Lower tier local authority – person
Upper tier local authority – person  
Region - person  

Other  
Deprivation decile – person  

Disclosure control  
From February 2019 new Hospital Episode Statistics (HES) disclosure control rules have been applied to all time periods. For the Lower and Upper Tier Local Authority and Region breakdowns values based on counts between 1 and 7 are suppressed. All unsuppressed values in the "Numerator" and "Other tooth extractions" columns are rounded to the nearest 5 for these breakdowns. Secondary suppression is not necessary using this method.  

Excel and CSV output  
<table>
<thead>
<tr>
<th>Column name</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year</td>
<td>Financial year</td>
</tr>
<tr>
<td>Quarter</td>
<td>Annual, quarter</td>
</tr>
<tr>
<td>Period of coverage</td>
<td>Actual time period the data cover</td>
</tr>
<tr>
<td>Breakdown</td>
<td>England, gender, age band, lower and upper tier local authority, region, deprivation decile, condition</td>
</tr>
<tr>
<td>Level</td>
<td>Detailed breakdown of each split - breakdown code</td>
</tr>
<tr>
<td>Level description</td>
<td>Further description of level/breakdown</td>
</tr>
<tr>
<td>Indicator value</td>
<td>Crude rate per 100,000 population</td>
</tr>
<tr>
<td>Lower CI</td>
<td>Lower 95% confidence interval</td>
</tr>
<tr>
<td>Upper CI</td>
<td>Upper 95% confidence interval</td>
</tr>
<tr>
<td>Observed</td>
<td>Number of FCEs where extraction performed, with a primary diagnosis of caries (numerator)</td>
</tr>
<tr>
<td>Population</td>
<td>Population count (denominator)</td>
</tr>
<tr>
<td>Contextual information</td>
<td>Number of FCEs where extraction performed, without a primary diagnosis of caries</td>
</tr>
</tbody>
</table>
### Appendix 1 – List of conditions included in indicator 3a

<table>
<thead>
<tr>
<th>Influenza, pneumonia</th>
</tr>
</thead>
<tbody>
<tr>
<td>J10 Influenza due to identified influenza virus</td>
</tr>
<tr>
<td>J11 Influenza, virus not identified</td>
</tr>
<tr>
<td>J13X Pneumonia due to Streptococcus pneumoniae</td>
</tr>
<tr>
<td>J14 Pneumonia due to Haemophilus influenzae</td>
</tr>
<tr>
<td>J153 Pneumonia due to streptococcus, group B</td>
</tr>
<tr>
<td>J154 Pneumonia due to other streptococci</td>
</tr>
<tr>
<td>J157 Pneumonia due to Mycoplasma pneumoniae</td>
</tr>
<tr>
<td>J159 Bacterial pneumonia, unspecified</td>
</tr>
<tr>
<td>J168 Pneumonia due to other specified infectious organisms</td>
</tr>
<tr>
<td>J181 Lobar pneumonia, unspecified</td>
</tr>
<tr>
<td>J188 Other pneumonia, organism unspecified</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Other vaccine preventable</th>
</tr>
</thead>
<tbody>
<tr>
<td>A36 Diphtheria</td>
</tr>
<tr>
<td>A37 Whooping cough</td>
</tr>
<tr>
<td>B05 Measles</td>
</tr>
<tr>
<td>B06 Rubella [German measles]</td>
</tr>
<tr>
<td>B161 Acute hepatitis B with delta-agent (coinfection) without hepatic coma</td>
</tr>
<tr>
<td>B169 Acute hepatitis B without delta-agent and without hepatic coma</td>
</tr>
<tr>
<td>B26 Mumps</td>
</tr>
<tr>
<td>M014 Rubella arthritis</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Angina</th>
</tr>
</thead>
<tbody>
<tr>
<td>I240 Coronary thrombosis not resulting in myocardial infarction</td>
</tr>
<tr>
<td>I248 Other forms of acute ischaemic heart disease</td>
</tr>
<tr>
<td>I249 Acute ischaemic heart disease, unspecified</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dehydration and gastroenteritis</th>
</tr>
</thead>
<tbody>
<tr>
<td>E86 Volume depletion</td>
</tr>
<tr>
<td>K52 Other noninfective gastroenteritis and colitis</td>
</tr>
<tr>
<td>A020 Salmonella enteritis</td>
</tr>
</tbody>
</table>
### A04 Other bacterial intestinal infections
- A059 Bacterial foodborne intoxication, unspecified
- A072 Cryptosporidiosis
- A08 Viral and other specified intestinal infections
- A09 Gastroenteritis and colitis of infectious and unspecified origin

### Pyelonephritis and kidney/urinary tract infections
- N10 Acute tubulo-interstitial nephritis
- N11 Chronic tubulo-interstitial nephritis
- N12 Tubulo-interstitial nephritis not specified as acute or chronic
- N136 Pyonephrosis
- N159 Renal tubulo-interstitial disease, unspecified
- N390 Urinary tract infection, site not specified
- N300 Acute cystitis
- N308 Other cystitis
- N309 Cystitis, unspecified

### Perforated/bleeding ulcer
- K250-K252 Gastric ulcer
- K254-K256
- K260-K262 Duodenal ulcer
- K264-K266
- K270-K272 Peptic ulcer, site unspecified
- K274-K276
- K280-K282 Gastrojejunal ulcer
- K284-K286
- K20 Oesophagitis
- K21 Gastro-oesophageal reflux disease

### Cellulitis
- L03 Cellulitis
- L04 Acute lymphadenitis
- L080 Pyoderma
- L088 Other specified local infections of skin and subcutaneous tissue
<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>L089</td>
<td>Local infection of skin and subcutaneous tissue, unspecified</td>
</tr>
<tr>
<td>L88</td>
<td>Pyoderma gangrenosum</td>
</tr>
<tr>
<td>L980</td>
<td>Pyogenic granuloma</td>
</tr>
<tr>
<td>I891</td>
<td>Lymphangitis</td>
</tr>
<tr>
<td>L01</td>
<td>Impetigo</td>
</tr>
<tr>
<td>L02</td>
<td>Cutaneous abscess, furuncle and carbuncle</td>
</tr>
</tbody>
</table>

**Ear, nose and throat infections**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>H66</td>
<td>Suppurative and unspecified otitis media</td>
</tr>
<tr>
<td>H67</td>
<td>Otitis media in diseases classified elsewhere</td>
</tr>
<tr>
<td>J02</td>
<td>Acute pharyngitis</td>
</tr>
<tr>
<td>J03</td>
<td>Acute tonsillitis</td>
</tr>
<tr>
<td>J06</td>
<td>Acute upper respiratory infections of multiple and unspecified sites</td>
</tr>
<tr>
<td>J312</td>
<td>Chronic pharyngitis</td>
</tr>
<tr>
<td>J040</td>
<td>Acute laryngitis</td>
</tr>
</tbody>
</table>

**Dental conditions**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A690</td>
<td>Necrotizing ulcerative stomatitis</td>
</tr>
<tr>
<td>K02</td>
<td>Dental caries</td>
</tr>
<tr>
<td>K03</td>
<td>Other diseases of hard tissues of teeth</td>
</tr>
<tr>
<td>K04</td>
<td>Diseases of pulp and periapical tissues</td>
</tr>
<tr>
<td>K05</td>
<td>Gingivitis and periodontal diseases</td>
</tr>
<tr>
<td>K06</td>
<td>Other disorders of gingiva and edentulous alveolar ridge</td>
</tr>
<tr>
<td>K08</td>
<td>Other disorders of teeth and supporting structures</td>
</tr>
<tr>
<td>K098</td>
<td>Other cysts of oral region, not elsewhere classified</td>
</tr>
<tr>
<td>K099</td>
<td>Cyst of oral region, unspecified</td>
</tr>
<tr>
<td>K12</td>
<td>Stomatitis and related lesions</td>
</tr>
<tr>
<td>K13</td>
<td>Other diseases of lip and oral mucosa</td>
</tr>
</tbody>
</table>

**Convulsions and epilepsy**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>R56</td>
<td>Convulsions, not elsewhere classified</td>
</tr>
<tr>
<td>O15</td>
<td>Eclampsia</td>
</tr>
<tr>
<td>G253</td>
<td>Myoclonus</td>
</tr>
</tbody>
</table>

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## Appendix 2 – List of conditions included in indicator 3.2

<table>
<thead>
<tr>
<th>Condition Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>J100</td>
<td>Influenza with pneumonia, virus identified</td>
</tr>
<tr>
<td>J110</td>
<td>Influenza with pneumonia, virus not identified</td>
</tr>
<tr>
<td>J111</td>
<td>Influenza with other respiratory manifestations, virus not identified (bronchiolitis with influenza)</td>
</tr>
<tr>
<td>J12</td>
<td>Viral pneumonia, not elsewhere classified</td>
</tr>
<tr>
<td>J13</td>
<td>Pneumonia due to Streptococcus pneumoniae</td>
</tr>
<tr>
<td>J14</td>
<td>Pneumonia due to Haemophilus influenzae</td>
</tr>
<tr>
<td>J15</td>
<td>Bacterial pneumonia, not elsewhere classified</td>
</tr>
<tr>
<td>J16</td>
<td>Pneumonia due to other infectious organisms, not elsewhere classified</td>
</tr>
<tr>
<td>J180</td>
<td>Bronchopneumonia, unspecified</td>
</tr>
<tr>
<td>J181</td>
<td>Lobar pneumonia</td>
</tr>
<tr>
<td>J189</td>
<td>Pneumonia unspecified</td>
</tr>
<tr>
<td>J21</td>
<td>Acute bronchiolitis</td>
</tr>
</tbody>
</table>