

Compendium of Population Health Indicators (including NHS OF, 3b)

Emergency readmissions within 30 days of discharge from hospital.

Hospital Care Domain & NHS OF Domain 3 – Helping people recover from episodes of ill health or following injury.

Indicator specification 102040 / 100712

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Document Management Revision History

Version	Date	Summary of Changes
1.3	March 2019	Draft based on CCGOIS Readmissions Indicator.
2.0	May 2019	Published on NHS Digital Website.
3.0	April 2020	Version uplift following changes agreed with the Indicator Consultation Group.
3.1	January 2022	Updated links to secondary care documents following changes to Hospital Episode Statistics (HES).
3.2	June 2022	Update of Treatment Function Codes used in 3-step process on page 8.
3.3	August 2022	Further updates of Treatment Function Codes used in 3-step process on page 8.
4.0	October 2023	Exclude all Mental Health providers no longer submitting to HES and all Mental Health Treatment Function Code activity ¹ . Also includes integration of NHS OF indicator 3b breakdowns.
5.0	October 2024	Further updates of Treatment Function Codes used in 3-step process on page 8 and additional detail added to improve clarity.

Indicator Assurance

	Status	Date
Methodology Review Group	NHS OF only	May 2012
Indicator Governance Board	NHS OF only	September 2012

 $www. data dictionary. nhs. uk/supporting_information/main_specialty_and_treatment_function_codes_table. html$

¹ A list of codes is available in the Mental Health Services section of the Treatment Function Codes listed in the NHS Data Dictionary and in Appendix A:

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Overview

Indicator title

Emergency readmissions within 30 days of discharge from hospital.

Indicator family name

Compendium of Population Health Indicators – Hospital Care Domain.

Condition / Topic area

All conditions excepting hospital admissions for cancer and obstetrics.

NHS Digital Indicator codes

102040

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.

Providers that have submitted activity to the Mental Health Services Dataset (MHSDS) <u>and</u> no longer submitting data to HES are excluded as well as any mental health activity from the remaining included providers.

Results are presented as trends (baselined on the first year of the series) and snapshots (as previously reported within the NHS Outcomes Framework) across a range of geographies, age bands and by sex.

Technical description

Indirectly age, sex, method of admission and diagnosis/procedure standardised percentage of emergency admissions to any hospital² in England occurring within 30 days of the last, previous discharge from hospital after admission.

Activity is <u>excluded</u> where:

- The provider has submitted data to the Mental Health Services Dataset (MHSDS) <u>and</u> no longer submits to HES.
- The specialised service within which the patient is treated includes mental health services³.

² Includes activity in English NHS Hospitals and English NHS commissioned activity in the independent sector.

³ A list of codes is available within the Mental Health Services section of the Treatment Function Codes listed in the NHS Data Dictionary and in Appendix A:

www.datadictionary.nhs.uk/supporting_information/main_specialty_and_treatment_function_codes_table.html

- The specialised service within which the patient is treated includes Obstetrics (501), Midwifery Service (560) or Maternity Function (610) and the primary diagnosis is Obstetrics.
- There is a diagnosis of cancer or chemotherapy for cancer during the stay in hospital or within the last year.

Results are presented as trends fixed on the first-point of the series (as well as snapshots as historically found within the NHS Outcomes Framework publication) and further broken down by Geographies (Local Authority of Residence, Region, ONS Area Classification, NHS and Private Providers, NHS England Region, Integrated Care Boards (ICB) and sub-Integrated Care Boards (sub-ICB)), Deprivation (Index of Multiple Deprivation (IMD 2019) Quintiles), age bands (All, <16 years, 16+ years, 16-74 years; 75+ years) and sex (male, female and persons).

(Note: when using indirect standardisation, it is inappropriate to compare sub-geographies with each other – all comparisons should be made to 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 In-Patient (CIP) Spells.

https://nhs-prod.global.ssl.fastly.net/binaries/content/assets/website-assets/publications/publications-admin-pages/methodological-changes/methodology-to-create-provider-and-cip-spells-from-hes-apc-data-v2.pdf

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.

The denominator is further filtered by the age and sex for each of the breakdown combinations below:

- All ages and female only, male only and both male and female (persons)
- <16 years and female only, male only and both male and female (persons)
- 16+ years and female only, male only and both male and female (persons)
- 16-74 years and female only, male only and both male and female (persons)
- 75+ years and female only, male only and both male and female (persons)

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 as they may be part of the patient's care plan.

Providers that have submitted activity to the Mental Health Services Dataset (MHSDS) <u>and</u> no longer submitting data to HES are excluded as well as any mental health activity from the remaining included providers.

Results are presented as trends (baselined on the first year of the series) and snapshots (as previously reported within the NHS Outcomes Framework) across a range of geographies, age bands and by sex.

Denominator

The number of finished CIP spells with a valid Geographic value⁴, 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)
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Conditions	1 or 3 (Discharged on clinical advice or discharged by a mental health
	review tribunal, <i>i.e.</i> not died, self-discharge or a baby or still in hospital).

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

4. Field Name PROCODET (provider)

Conditions Contains: providers that have submitted activity to the Mental Health

Services Dataset (MHSDS) and no longer submitting data to HES.

This is used to exclude this activity.

⁴ The indicator calculates across a range of geographies (Lower tier local authority, Region, ONS Area Classification, Provider, ICB, sub-ICB and NHS England Region) the value must be valid to be included for the geography being reported. Deprivation is the exception as instances where no valid value is included.

The FIRST episode in the CIP spell has:

5. Field Name EPIORDER (episode order)

Conditions Equals 1.

6. Field Name Geography² (field dependent on the Geography being processed)

Conditions Valid value i.e. a known Geography code for the reporting year, i.e.

excludes unknowns. Note: legacy geographies are mapped to new organisation codes when known. There is an exception for IMD where all

invalid values are grouped for reporting.

7. Field Name EPITYPE (episode type)

Conditions Equals 1. General episode types only.

8. Field Name CLASSPAT (patient classification)

Conditions Equals 1. Ordinary Admissions only.

9. 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. Note: values are used later to filter into the

reporting Age bands: <16 years, 16+ years, 16-74 years; 75+ years.

10. Field Name DOB (patient date of birth)

Conditions Not 01/01/1900 or 01/01/1901 representing unknown.

11. Field Name SEX (sex of patient)

Conditions Equals 1 (male) or 2 (female). Note: values are used later to filter into the

reporting groups: male only, female only and persons (male and female).

AND the LAST or DISCHARGE episode in the CIP spell has:

12. 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:

13. 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

14. Field Name TRETSPEF (the specialised service within which the Patient is treated)

Conditions Not 501, 560, 610 (Obstetrics)

15. Field Name DIAG_01 (primary diagnosis)

Conditions Does not begin with 'O' (Obstetrics).

OR

16. Field Name TRETSPEF (the specialised service within which the Patient is treated)

Conditions Not 656, 700, 710, 711, 712, 713, 715, 720, 721, 722, 723, 724, 725, 726, 727, 730 (Mental Health).

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 procedure⁵ 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 specialties⁶ and sub-groups used above for filtering/standardisation are:

Medical Specialties: 190, 192, 223, 242, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 270, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 335, 340, 341, 342, 343, 344, 345, 346, 347, 348, 350, 352, 360, 361, 370, 371, 400, 401, 410, 420, 421, 422, 424, 430, 431, 450, 451, 460, 501, 502, 503, 505, 510, 520, 560, 610, 620.

Surgical Specialties: 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 113, 115, 120, 130, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 160, 161, 170, 171, 172, 173, 174, 180, 191, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 241.

www.datadictionary.nhs.uk/supporting_information/main_specialty_and_treatment_function_codes_table.html

⁵ Validity is defined in this case as not being either: (1) a null value, (2) "-" meaning "no operation performed", (3) "&" meaning "not known".

⁶ Taken from:

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 at readmission:

- Those with a main treatment function and primary diagnosis coded as obstetrics.
- Those with a diagnosis of cancer (other than benign or *in situ*) or chemotherapy for cancer.
- Those providers that have submitted activity to the Mental Health Services Dataset (MHSDS) and no longer submitting data to HES.
- Those with a main treatment function as mental health services.

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 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).

3. Field Name PROCODET (provider)

Conditions Contains: providers that have submitted activity to the Mental Health

Services Dataset (MHSDS) and no longer submitting data to HES.

This is used to exclude this activity.

The FIRST episode in the CIP spell has:

4. Field Name EPIORDER (episode order)

Conditions Equals 1.

5. Field Name Geography² (field dependent on the Geography being processed)

Conditions Valid value i.e. a known Geography code for the reporting year, i.e.

excludes unknowns. Note: legacy geographies are mapped to new organisation codes when known. There is an exception for IMD where all

invalid values are grouped for reporting.

6. Field Name EPITYPE (episode type)

Conditions Equals 1. General episode types only.

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:

8. 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

9. Field Name TRETSPEF (the specialised service within which the Patient is treated)

Conditions Not 501, 560, 610 (Obstetrics)

10. Field Name DIAG_01 (primary diagnosis)

Conditions Does not begin with 'O' (Obstetrics).

OR

11. Field Name TRETSPEF (the specialised service within which the Patient is treated)

Conditions Not 656, 700, 710, 711, 712, 713, 715, 720, 721, 722, 723, 724, 725, 726,

727, 730 (Mental Health).

Indirect Standardisation

The first step is to calculate the casemix-specific rates for the standard or reference population.

The trends produced can be based on either annual or three-year pooled datasets and the standard population is derived from the first-point of the series, for example, for a five-year annual trend from 2013/14 to 2017/18 the first-point year 2013/14 is used as the standard population. For a three-year pooled trend 2013/16 to 2015/18 the first-point pool 2013/16 is used as the standard population.

Snapshots are created by setting the standard population as the same as the reporting year.

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+;

As the indicator is broken down into broader Age bands for reporting the bands used depends on the breakdown:

All years uses: <1, 1-4, 5-9, 10-15, 16-64, 65-74, 75-84, 85+

<16 years uses: <1, 1-4, 5-9, 10-15</p>

o 16+ years uses: 16-64, 65-74, 75-84, 85+

o 16-74 years uses: 16-64, 65-74

o 75+ years uses: 75-84, 85+

Sex based on SEX as 1, 2 (male and female);

As the indicator is broken down by sex this grouping is only used for the persons reporting category.

- 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 *e.g.* each local authority. 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 geographic breakdown) and the number of events that would be expected if it had experienced the same event rates as those of patients in England in the standard population and across the first-point time period, 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.

 λ_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.

 λ_i is the crude age-specific rate in the standard population in casemix group i.

 λ is the overall crude rate in the standard population.

Confidence Intervals

The lower and upper limits of the 95% and 99.8% 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 probabilities⁷.

The 95% limits are given by:

$$IS_{Rate (LL 95.0\%)} = \frac{O}{E} \times \left(1 - \frac{1}{90} - \frac{1.96}{3 \times \sqrt{O}}\right)^3 \times \lambda \times 100$$

$$IS_{Rate\;(UL\;95.0\%)} = \frac{(O+1)}{E} \times \left(1 - \frac{1}{9(O+1)} + \frac{1.96}{3 \times \sqrt{(O+1)}}\right)^3 \times \lambda \times 100$$

The 99.8% limits are given by:

$$IS_{Rate (LL 99.8\%)} = \frac{O}{E} \times \left(1 - \frac{1}{90} - \frac{3.09}{3 \times \sqrt{O}}\right)^3 \times \lambda \times 100$$

$$IS_{Rate\;(UL\;99.8\%)} = \frac{(O+1)}{E} \times \left(1 - \frac{1}{9(O+1)} + \frac{3.09}{3 \times \sqrt{(O+1)}}\right)^3 \times \lambda \times 100$$

(expressed per 100 denominator population)

where:

⁷ Breslow NE and Day NE. Statistical Methods in Cancer Research, Volume II: The Design and Analysis of Cohort Studies. Lyon: International Agency for Research on Cancer, World Health Organization, 1987: 69.

- O is the total observed number of events in the subject population.
 E is the total expected number of events in the subject population.
 λ is the overall crude rate in the standard population.

Presentation

Breakdowns

Time periods

Trends and snapshots for financial year data across 10 years.

Geographic

Local Authority of Residence, Region, ONS Area Classification, NHS and Private Providers, sub-ICB, ICB or NHS England Region.

Demographic

Geographical and Deprivation (IMD 2019 quintiles) breakdowns for each age band (All, <16 years, 16+ years, 16-74 years; 75+ years) and sex (male, female and persons).

Disclosure control

The indicator is calculated following HES guidance on suppression of small numbers:

https://digital.nhs.uk/data-and-information/data-tools-and-services/data-services/hospital-episode-statistics/change-to-disclosure-control-methodology-for-hes-and-ecds-from-september-2018

Excel output

Column name	Output
Year	Financial year being reported.
Period of coverage	Start and end dates of the reporting period.
Breakdown	National, Deprivation quintile, Sex, Lower tier local authority, Region, ONS Area Classification, Provider, sub-ICB, ICB or NHS England Region.
Level	ONS or ODS codes within each Breakdown.
Level description	Description matching the ONS or ODS codes.
Age Breakdown	The age group relating to the breakdown: All, <16 years, 16+ years, 16-74 years; 75+ years.
Sex Breakdown	The sex group relating to the breakdown: male, female, persons.
Diagnosis/Procedure Breakdown	The diagnosis or procedure breakdown (if applicable) or "All" otherwise.
Method	Annual Trends and Snapshot years.
Indicator value	Indirectly standardised percentage rate (ISR).
Lower CI (95%)	ISR lower 95% confidence interval.
Upper CI (95%)	ISR upper 95% confidence interval.
Lower CI (99.8%)	ISR lower 99.8% confidence interval.
Upper CI (99.8%)	ISR upper 99.8% confidence interval.
Numerator	The number of readmissions within 30 days.
Denominator	The number of discharges to end of financial year.
Expected	The expected number of readmissions within 30 days.
Banding	National Comparison, based on 95% and 99.8% confidence intervals of the rate ⁸ .
Warnings	Caution in interpretation of data. Numbers of patients discharged too small for meaningful comparisons (<i>i.e.</i> below 200).

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⁸ B1 = Significantly lower than the national average at the 99.8% level; B5 = Significantly lower than the national average at the 95% level but not at the 99.8% level; W = National average lies within expected variation (95% confidence interval); A5 = Significantly higher than the national average at the 95% level but not at the 99.8% level; A1 = Significantly higher than the national average at the 99.8% level.

CSV output

Column name	Output
Indicator name	Descriptive name for the indicator.
Year	Financial year.
Period of coverage	Start and end dates of the reporting period.
Breakdown	National, Deprivation quintile, Sex, Lower tier local authority, Region, ONS Area Classification, Provider, sub-ICB, ICB or NHS England Region.
Level	ONS or ODS codes within each Breakdown.
Level description	Description matching the ONS or ODS codes.
Age Breakdown	The age group relating to the breakdown: All, <16 years, 16+ years, 16-74 years; 75+ years.
Sex Breakdown	The sex group relating to the breakdown: male, female, persons.
Diagnosis/Procedure Breakdown	The diagnosis or procedure breakdown (if applicable) or "All" otherwise.
Method	Annual Trends and Snapshot years.
Indicator value	Indirectly standardised percentage rate (ISR).
Lower CI (95%)	ISR lower 95% confidence interval.
Upper CI (95%)	ISR upper 95% confidence interval.
Lower CI (99.8%)	ISR lower 99.8% confidence interval.
Upper CI (99.8%)	ISR upper 99.8% confidence interval.
Numerator	The number of readmissions within 30 days.
Denominator	The number of discharges to end of financial year.
Expected	The expected number of readmissions within 30 days.
Banding	National Comparison, based on 95% and 99.8% confidence intervals of the rate ⁵ .
Warnings	Caution in interpretation of data. Numbers of patients discharged too small for meaningful comparisons (i.e. below 200).

Appendix A: Mental Health Services Treatment Functions

Code	Treatment Function Name
656	CLINICAL PSYCHOLOGY
700	LEARNING DISABILITY
710	ADULT MENTAL ILLNESS
711	CHILD and ADOLESCENT PSYCHIATRY
712	FORENSIC PSYCHIATRY
713	PSYCHOTHERAPY
715	OLD AGE PSYCHIATRY
720	EATING DISORDERS
721	ADDICTION SERVICES
722	LIAISON PSYCHIATRY
723	PSYCHIATRIC INTENSIVE CARE
724	PERINATAL PSYCHIATRY
725	MENTAL HEALTH RECOVERY AND REHABILITATION SERVICE
726	MENTAL HEALTH DUAL DIAGNOSIS SERVICE
727	DEMENTIA ASSESSMENT SERVICE
730	NEUROPSYCHIATRY SERVICE