Royal College of Physicians

National Respiratory Audit Programme (NRAP)

Clinical outcomes (2021–23) and outliers

Summary report

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ARNS Association of Respiratory Nurses

ASTHMA+ LUNG UK

IMPERIAL

RCGP Royal College of General Practitioners

British Thoracic Society

crown informatics

RCPCH Royal College of Paediatrics and Child Health *Leading the way in Children's Health*

ACPRC

PCRS

Commissioned by:

HQIP Healthcare Quality Improvement Partnership

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Introduction

Respiratory conditions are the third biggest killer in the UK, are a leading driver of winter NHS pressures, and the second leading contributor to NHS bed days.[1] There are great disparities in respiratory outcomes across the NHS driven by health inequalities.

The outcome of a patient following admission to hospital is key to their recovery and an important proxy for the quality of care across the healthcare system, offering insights into where care can be improved. This report presents information on the 30- and 90-day outcomes of 116,095 adults, and 19,477 children and young people who were admitted to hospitals in England and Wales for asthma or COPD; and whose data were submitted to the NRAP adult asthma, children and young people asthma, or COPD secondary care audits between April 2021 – March 2023.

Results are reported at national level (England and Wales). This report should read as an addendum to the NRAP State of the nation clinical audit reports for the cohort period:

- *Drawing Breath* – clinical audit report 2021–22
- *Breathing Well* – clinical audit report 2022–23

This report can be used by service providers, commissioners and clinical teams to identify areas of success or those requiring improvement to facilitate and influence change.

NRAP published the 2023–24 state of the nation clinical audit report, *Catching our breath: Time for change in respiratory care,* in June 2025 which details further recommendations for improving care. Please note that the data in the *Catching our breath* report cover April 2023 – March 2024, representing a different cohort than this report.

Reading and understanding this report

We have made comparisons with previous asthma and COPD outcomes in this report, specifically the 2018–20 clinical outcomes summary report which was published in March 2023.

Adjusted odds ratios (tables 1.2 and 2.2) – represents the odds that an outcome will occur given a particular exposure, compared with the odds of the outcome occurring in the absence of that exposure. For example, an odds ratio of 0.75 means that in that particular group the outcome is 25% less likely to occur. An odds ratio of 1.33 means that in that particular group the outcome is 33% more likely to occur. Adjusted odds ratios consider other variables in the model that may act as confounding variables between the exposure and the outcome. See Appendix A: Methodology for more detailed information.

Data have also been presented as forest plots, with confidence intervals plotted for each variable impacting mortality and readmission. Each dot represents an (adjusted) odds ratio coefficient, with the lines either side of the dot representing the associated confidence interval. Lines that do not cross '1' indicate a statistically significant result.

Important information regarding Wales outcomes data for the cohort periods 01 April 2021 to 31 March 2022 and 01 April 2022 to 31 March 2023.
In 21/22 and 22/23 there were 1373 and 2185 uncoded patient episodes respectively for respiratory medicine in Welsh hospitals. This will have affected the data contained within the report by overestimating Welsh case ascertainment and underestimating the proportion of Welsh patients who are readmitted.

Case ascertainment

Case ascertainment rates were calculated based on the number of records entered to the audit compared with national data on hospital admissions for asthma and COPD in England and Wales.[a]

Adult asthma

Case ascertainment: 1 April 2021 – 31 March 2022	Number of eligible patients reported from HES (England) / PEDW (Wales)	Number of patient records submitted to the audit	Case ascertainment %
All	33,827	16,132	47.7%
England	32,902	15,412	46.8%
Wales	925	720	77.8%
Case ascertainment: 1 April 2022 – 31 March 2023	**Number of eligible patients reported from HES (England) / PEDW (Wales)**	**Number of patient records submitted to the audit**	**Case ascertainment %**
All	37,033	16,701	45.1%
England	35,860	15,889	44.3%
Wales	1,173	812	69.2%

Children and young people asthma

Case ascertainment: 1 April 2021 – 31 March 2022	Number of eligible patients reported from HES (England) / PEDW (Wales)	Number of patient records submitted to the audit	Case ascertainment %
All	15,353	14,168	92.3%
England	14,595	13,433	92.0%
Wales	758	735	97.0%
Case ascertainment: 1 April 2022 – 31 March 2023	**Number of eligible patients reported from HES (England) / PEDW (Wales)**	**Number of patient records submitted to the audit**	**Case ascertainment %**
All	16,467	11,155	67.5%
England	15,745	10,479	66.6%
Wales	722	676	93.6%

COPD

Case ascertainment: 1 April 2021 – 31 March 2022	Number of eligible patients reported from HES (England) / PEDW (Wales)	Number of patient records submitted to the audit	Case ascertainment %
All	162,451	63,409	39.5%
England	157,003	61,587	39.2%
Wales	5,448	2,535	46.5%
Case ascertainment: 1 April 2022 – 31 March 2023	**Number of eligible patients reported from HES (England) / PEDW (Wales)**	**Number of patient records submitted to the audit**	**Case ascertainment %**
All	122,161	66,406	54.4%
England	117,395	62,907	53.6%
Wales	4,766	3,499	73.4%

[a] Data on hospital admissions are obtained from Hospital Episode Statistics (HES) Admitted Patient Care (APC) (England) and Digital Health Care Wales (DHCW) Patient Episode Database (PEDW) (Wales).

Section 1: Mortality

1.1 Mortality within 30 and 90 days of index admission

Of adults admitted to acute hospital with an asthma attack or exacerbation of COPD[1]: The data shown demonstrate the proportions of patients in England and Wales entered into the **adult asthma** and **COPD** clinical audits who died within 30 or 90 days of admission to hospital. Overall numbers shown for adult asthma and COPD (denominators) represent all index admissions (ie first admission during time period) of successfully linked patients from NRAP clinical audits. Data on the top three reasons for mortality for adults admitted to hospital with both asthma and COPD are highlighted. COVID-19 replaced chronic ischaemic heart disease as the third most common cause of death in those with COPD despite mortality rates for chronic ischaemic heart disease remaining stable.

	All	England	Wales
Mortality			
Adult asthma	**n = 26,150**	**n = 25,013**	**n = 1,137**
Within 30 days of index admission	148 (0.6%)	143 (0.6%)	5 (0.4%)
Within 90 days of index admission	301 (1.2%)	292 (1.2%)	9 (0.8%)
COPD	**n= 89,945**	**n= 85,658**	**n= 4,287**
Within 30 days of index admission	6,728 (7.5%)	6,290 (7.3%)	438 (10.2%)
Within 90 days of index admission	12,732 (14.2%)	11,996 (14%)	736 (17.2%)

1.1.1 Mortality within 30 days of index admission: by top three reasons

	All
Adult asthma	**n = 148**
Asthma	42 (28.4%)
Other chronic obstructive pulmonary disease	8 (5.4%)
Pneumonia, unspecified	8 (5.4%)
COPD	**n = 6,728**
Other chronic obstructive pulmonary disease	4,284 (63.7%)
Malignant neoplasm of bronchus and lung	378 (5.6%)
COVID-19	268 (4.0%)

1.1.2 Mortality within 90 days of index admission: by top three reasons

	All
Adult asthma	**n = 301**
Asthma	61 (20.3%)
Other chronic obstructive pulmonary disease	25 (8.3%)
COVID-19	15 (5.0%)
COPD	**n = 12,732**
Other chronic obstructive pulmonary disease	7,335 (57.6%)
Malignant neoplasm of bronchus and lung	882 (6.9%)
COVID-19	550 (4.3%)

1.2 Mortality within 30 and 90 days odds ratio data

This table provides odds ratio data regarding the influence of specific variables, such as age, on the likelihood of mortality in adults with COPD and asthma after their admission to hospital. See the methodology report for further detail.

Variable *(see Appendix A: Methodology for definition of adjusted odds ratio)*	**COPD estimates: Died in 30 days (adjusted odds ratio with 95% CI)**	**COPD estimates: Died in 90 days (adjusted odds ratio with 95% CI)**	**Adult asthma estimates: Died in 30 days (adjusted odds ratio with 95% CI)**	**Adult asthma estimates: Died in 90 days (adjusted odds ratio with 95% CI)**
Gender (Male = 1 (Reference))				
Female	0.83 (0.79 to 0.88)	0.85 (0.81 to 0.88)	0.90 (0.63 to 1.30)	0.97 (0.75 to 1.26)
Age				
35–44	0.23 (0.12 to 0.44)	0.32 (0.22 to 0.47)	-	-
45–54	0.43 (0.36 to 0.52)	0.41 (0.35 to 0.47)	-	-
55–-64	0.62 (0.56 to 0.68)	0.62 (0.58 to 0.67)	-	-
65–74	1 (Reference)	1 (Reference)	-	-
75–84	1.52 (1.43 to 1.62)	1.51 (1.44 to 1.59)	-	-
85+	2.37 (2.19 to 2.56)	2.36 (2.22 to 2.50)	-	-
+1 year[b]	-	-	1.06 (1.05 to 1.07)	1.07 (1.06 to 1.08)
Joint England / Wales index of multiple deprivation (IMD) quintile				
1 (most deprived)	1 (Reference)	1 (Reference)	1 (Reference)	1 (Reference)
2	1.02 (0.95 to 1.10)	1.03 (0.97 to 1.08)	1.18 (0.73 to 1.91)	1.09 (0.78 to 1.53)
3	1.04 (0.96 to 1.13)	1.04 (0.98 to 1.10)	0.72 (0.41 to 1.27)	0.70 (0.47 to 1.04)
4	1.00 (0.92 to 1.09)	1.02 (0.95 to 1.09)	1.09 (0.65 to 1.83)	0.90 (0.61 to 1.31)
5 (least deprived)	1.05 (0.95 to 1.16)	1.01 (0.94 to 1.10)	1.03 (0.59 to 1.80)	0.95 (0.64 to 1.42)
Missing / Unavailable	1.17 (0.89 to 1.53)	1.09 (0.88 to 1.35)	0.75 (0.10 to 5.76)	0.33 (0.04 to 2.46)
Charlson Comorbidity Index (adults only)[c]				
0–1	1 (Reference)	1 (Reference)	-	-
2	1.10 (1.00 to 1.21)	1.13 (1.05 to 1.21)	-	-
3	1.63 (1.53 to 1.73)	1.67 (1.59 to 1.75)	-	-
4	1.74 (1.58 to 1.90)	1.79 (1.67 to 1.92)	-	-
5	2.08 (1.84 to 2.35)	2.32 (2.12 to 2.55)	-	-
6	2.66 (2.23 to 3.17)	2.59 (2.25 to 3.00)	-	-
7+	4.40 (3.87 to 5.01)	5.61 (5.05 to 6.23)	-	-
CCI +1 comorbidity	-	-	1.49 (1.36 to 1.63)	1.46 (1.37 to 1.57)
Non-invasive ventilation during admission (COPD only)	4.00 (3.73 to 4.29)	2.91 (2.75 to 3.09)	-	-

[b] Age was included as a quadratic variable for the model for adult asthma mortality (due to low numbers of deaths) and for CYP asthma readmission (due to the narrow range of ages). Odds ratios represent increased odds of the outcome for each +1 year of age, plus an additional effect to represent a non-linear relationship. A quadratic term >1 indicates that the relationship between age and the log odds of the outcome is in the form of a 'U', while a value <1 indicates a relationship in the form of 'ᑎ'.

[c] Comorbidities were defined using the Charlson comorbidity index (CCI) (https://pubmed.ncbi.nlm.nih.gov/3558716/) with updated weights (https://pubmed.ncbi.nlm.nih.gov/21330339/)

Variable *(see Appendix A: Methodology for definition of adjusted odds ratio)*	COPD estimates: Died in 30 days (adjusted odds ratio with 95% CI)	COPD estimates: Died in 90 days (adjusted odds ratio with 95% CI)	Adult asthma estimates: Died in 30 days (adjusted odds ratio with 95% CI)	Adult asthma estimates: Died in 90 days (adjusted odds ratio with 95% CI)
Charlson Comorbidity Index (adults only)[d]				
Severe and life-threatening asthma[e]	-	-	1.94 (1.35 to 2.79)	1.47 (1.14 to 1.88)
Region				
London	1 (reference)	1 (reference)	1 (reference)	1 (reference)
East of England	1.30 (1.04 to 1.61)	1.25 (1.06 to 1.47)	2.39 (1.18 to 4.85)	1.88 (1.08 to 3.26)
Midlands	1.31 (1.08 to 1.60)	1.22 (1.06 to 1.42)	1.90 (0.97 to 3.72)	1.25 (0.74 to 2.12)
North East and Yorkshire	1.32 (1.08 to 1.62)	1.26 (1.08 to 1.46)	1.83 (0.91 to 3.65)	1.17 (0.68 to 2.01)
North West	1.39 (1.14 to 1.69)	1.30 (1.12 to 1.51)	2.06 (1.03 to 4.11)	1.20 (0.69 to 2.06)
South East	1.25 (1.02 to 1.53)	1.20 (1.03 to 1.39)	1.53 (0.72 to 3.24)	1.17 (0.66 to 2.06)
South West	1.51 (1.21 to 1.90)	1.28 (1.08 to 1.52)	0.99 (0.36 to 2.67)	0.79 (0.38 to 1.67)
Wales	1.93 (1.53 to 2.44)	1.61 (1.35 to 1.93)	1.74 (0.60 to 5.02)	1.08 (0.47 to 2.47)

Forest plots summarising the data can be viewed here.

1.3 Mortality within 30 and 90 days narrative

Due to small number suppression rules and the low percentage of adult asthma deaths (0.6% within 30 days and 1.2% within 90 days of admission), some data for adult asthma cannot be reported, resulting in gaps in the tables.

An association can be seen between regions and COPD mortality in the table above. All regions report a higher likelihood of mortality than the reference region (London), with Wales and South West regions reporting the highest. The variation seen in Wales is significant, with an odds ratio of 1.93 (95% CI 1.53 to 2.44).

There is some evidence to suggest that regional variation can also be seen within adult asthma, with a higher likelihood of mortality in the east and the north-west of England relative to the reference region, London. However, due to the small number of asthma deaths in the cohort, this finding is inconclusive.

Due to small number suppression, we are unable to report on mortality in children and young people with asthma. For more information on child mortality due to asthma, please refer to the National Child Mortality Database.

[d] Comorbidities were defined using the Charlson comorbidity index (CCI) (https://pubmed.ncbi.nlm.nih.gov/3558716/) with updated weights (https://pubmed.ncbi.nlm.nih.gov/21330339/)

[e] *Determined based on hospital admission data (respiratory rate, heart rate etc)*

Section 2: Readmissions

2.1 Readmission within 30 and 90 days of index discharge[f,g]

Of adults discharged from acute hospital with an asthma attack or an exacerbation of COPD, or children and young people admitted with an asthma attack: The data show proportions of patients in England and Wales entered into the adult asthma, children and young people asthma and COPD audits who were readmitted to hospital within 30-days and 90-days of discharge. Overall numbers shown for adult asthma, children and young people asthma and COPD (denominators) represent all index admissions (ie first admission during time period) of successfully linked patients from NRAP clinical audits who were discharged alive.

	All	England	Wales
Readmission			
Adult asthma	**n = 26,064**	**n = 24,930**	**n = 1,134**
Within 30 days of index discharge	2,549 (9.8%)	2,450 (9.8%)	99 (8.7%)
Within 90 days of index discharge	5,032 (19.3%)	4,842 (19.4%)	190 (16.8%)
Children and young people asthma	**n = 19,474**	**n = 18,395**	**n = 1,079**
Within 30 days of index discharge	1,590 (8.2%)	1,495 (8.1%)	95 (8.8%)
Within 90 days of index discharge	3,324 (17.1%)	3,121 (17.0%)	203 (18.8%)
COPD	**n = 85,713**	**n = 81,779**	**n = 3,934**
Within 30 days of index discharge	18,325 (21.4%)	17,677 (21.6%)	648 (16.5%)
Within 90 days of index discharge	33,019 (38.5%)	31,784 (38.9%)	1,235 (31.4%)

2.1.1 Readmission within 30 days of index discharge: by top three reasons

	All
Adult asthma	**n = 2,970**
Asthma	1077 (36.3%)
Pneumonia, unspecified organism	173 (5.8%)
Other chronic obstructive pulmonary disease	133 (4.5%)
Children and young people asthma	**n = 19,474**
Asthma	820 (44.5%)
Viral infection of unspecified site	488 (26.5%)
Acute (lower) respiratory (tract) infection	262 (5.9%)
COPD	**n = 85,713**
Other chronic obstructive pulmonary disease	9,364 (43.0%)
Pneumonia, unspecified organism	2,869 (13.2%)
COVID-19	809 (3.7%)

2.1.2 Readmission within 90 days of index discharge: by top three reasons

	All
Adult asthma	**n = 7,541**
Asthma	2515 (33.4%)
Pneumonia, unspecified organism	379 (5.0%)
Other chronic obstructive pulmonary disease	358 (4.7%)
Children and young people asthma	**n = 4,404**
Asthma	1,828 (41.5%)
Viral infection of unspecified site	1,277 (29.0%)
Acute (lower) respiratory (tract) infection	262 (5.9%)
COPD	**n = 52,827**
Other chronic obstructive pulmonary disease	22,834 (43.2%)
Pneumonia, unspecified organism	6,563 (12.4%)
COVID-19	1,713 (3.2%)

[f] *Only including patients that were alive at discharge. Same day readmissions have been excluded from the analysis.*

[g] *J45: Asthma; J18: Pneumonia, unspecified organism; J44: Other chronic obstructive pulmonary disease; B34: Viral infection of unspecified site; J22: Acute (lower) respiratory (tract) infection; U07: COVID-19*

As with mortality, reflecting the timeframe of data collection, adults discharged from hospital with COPD showed that COVID-19 was the third most common reason for readmission compared to the *NACAP Clinical outcomes summary report 2018–20*. Across adult asthma, children and young people with asthma, and COPD, the most common reason for readmission remains an acute exacerbation – the same condition that led to the initial hospital admission.

The number of readmissions across the three audit workstreams is slightly lower overall than the data shown in the previous report. However, the proportion of people readmitted remains high and there is significant potential to improve this outcome. In NRAP's State of the nation report, *Catching our breath: Time for change in respiratory care*[1], recommendations around improving timely access to optimal care and improving discharge planning outline what can be done to improve care for asthma and COPD patients.

2.2 Readmission within 30 and 90 days odds ratio data

This table shows if variables like gender affect readmission odds for adults with COPD and asthma, as well as children and young people with asthma after hospital discharge. See the methodology report for further detail.

Variable *(see Appendix A: Methodology for definition of adjusted odds ratio)*	**COPD estimates: Readmitted in 30 days**	**COPD estimates: Readmitted in 90 days**	**Adult asthma estimates: Readmitted in 30 days**	**Adult asthma estimates: Readmitted in 90 days**	**CYP asthma estimates: Readmitted in 30 days**	**CYP asthma estimates: Readmitted in 90 days**
Gender (Male = 1 (Reference))						
Female	0.98 (0.95 to 1.01)	0.98 (0.96 to 1.01)	1.20 (1.09 to 1.31)	1.17 (1.09 to 1.26)	1.06 (0.95 to 1.19)	1.13 (1.04 to 1.22)
Age						
16–24	-	-	0.69 (0.57 to 0.83)	0.71 (0.62 to 0.82)	-	-
25–34	-	-	1 (Reference)	1 (Reference)	-	-
35–44	1.03 (0.86 to 1.24)	0.97 (0.83 to 1.13)	1.09 (0.93 to 1.27)	1.01 (0.90 to 1.14)	-	-
45–54	0.93 (0.86 to 1.01)	0.91 (0.85 to 0.97)	1.02 (0.88 to 1.20)	1.00 (0.89 to 1.12)	-	-
55–64	0.90 (0.86 to 0.95)	0.88 (0.84 to 0.92)	0.99 (0.85 to 1.16)	0.94 (0.84 to 1.06)	-	-
65–74	1 (Reference)	1 (Reference)	1.22 (1.04 to 1.45)	1.11 (0.98 to 1.26)	-	-
75–84	1.09 (1.04 to 1.13)	1.11 (1.07 to 1.15)	1.35 (1.14 to 1.61)	1.30 (1.14 to 1.48)	-	-
85+	1.08 (1.02 to 1.15)	1.12 (1.07 to 1.18)	1.56 (1.27 to 1.92)	1.50 (1.27 to 1.77)	-	-
+1 year*	-	-	-	-	0.94 (0.92 to 0.95)	0.90 (0.89 to 0.91)
+1 year (quadratic)*	-	-	-	-	1.01 (1.01 to 1.02)	1.02 (1.01 to 1.02)
Joint England / Wales IMD quintile						
1 (most deprived)	1 (Reference)	1 (Reference)	1 (Reference)	1 (Reference)	1 (Reference)	1 (Reference)
2	0.94 (0.89 to 0.98)	0.96 (0.93 to 1.00)	0.91 (0.80 to 1.02)	0.95 (0.87 to 1.04)	1.01 (0.87 to 1.18)	0.96 (0.85 to 1.07)

Variable *(see Appendix A: Methodology for definition of adjusted odds ratio)*	COPD estimates: Readmitted in 30 days	COPD estimates: Readmitted in 90 days	Adult asthma estimates: Readmitted in 30 days	Adult asthma estimates: Readmitted in 90 days	CYP asthma estimates: Readmitted in 30 days	CYP asthma estimates: Readmitted in 90 days
3	0.89 (0.85 to 0.94)	0.90 (0.86 to 0.94)	0.95 (0.84 to 1.08)	0.91 (0.82 to 1.00)	0.93 (0.78 to 1.10)	0.90 (0.79 to 1.02)
Joint England / Wales IMD quintile						
4	0.89 (0.84 to 0.94)	0.89 (0.85 to 0.93)	1.08 (0.94 to 1.23)	0.92 (0.83 to 1.01)	1.13 (0.95 to 1.35)	0.93 (0.81 to 1.06)
5 (least deprived)	0.86 (0.81 to 0.92)	0.86 (0.81 to 0.91)	0.84 (0.72 to 0.98)	0.76 (0.68 to 0.85)	1.09 (0.89 to 1.32)	0.99 (0.86 to 1.14)
Missing / Unavailable	0.93 (0.77–1.12)	0.91 (0.78–1.06)	1.09 (0.72–1.64)	1.11 (0.82–1.51)	1.08 (0.57–2.03)	1.09 (0.69–1.72)
Charlson comorbidity index (CCI) (adults only)						
0-1	1 (Reference)	1 (Reference)	1 (Reference)	1 (Reference)		
2	1.10 (1.03–1.16)	1.14 (1.08–1.19)	1.36 (1.16– to 1.61)	1.42 (1.25 to 1.61)	-	-
3	1.29 (1.24 to 1.35)	1.38 (1.33 to 1.43)	1.61 (1.40 to 1.85)	1.72 (1.54 to 1.92)	-	-
4	1.43 (1.34 to 1.53)	1.52 (1.44 to 1.61)	1.87 (1.47 to 2.37)	2.19 (1.81 to 2.66)	-	-
5	1.58 (1.45 to 1.72)	1.64 (1.52 to 1.78)	1.62 (1.12 to 2.34)	2.39 (1.79 to 3.18)	-	-
6	1.48 (1.27 to 1.72)	1.58 (1.38 to 1.81)	1.47 (0.80 to 2.70)	1.90 (1.19 to 3.05)	-	-
7+	1.66 (1.48 to 1.86)	1.72 (1.55 to 1.91)	3.35 (2.14 to 5.24)	2.93 (1.95 to 4.40)	-	-
Length of stay (+10 days)	1.10 (1.08 to 1.12)	1.09 (1.07 to 1.10)	1.30 (1.21 to 1.39)	1.41 (1.33 to 1.50)	2.18 (1.45 to 3.29)	2.42 (1.76 to 3.33)
Non-invasive ventilation during admission (COPD only)	1.09 (1.02 to 1.16)	1.06 1.01 to 1.12)	-	-	-	-
Severe and life-threatening asthma	-	-	1.05 (0.96 to 1.14)	1.13 (1.05 to 1.20)	0.77 (0.68 to 0.88)	0.85 (0.77 to 0.94)
Any IV drug administered (asthmatic children only)	-	-	-	-	1.19 (1.03 to 1.39)	1.23 (1.10 to 1.38)
Region						
London	1 (reference)	1 (reference)	1 (reference)	1 (reference)	1 (reference)	1 (reference)
East of England	0.91 (0.81 to 1.02)	0.95 (0.85 to 1.05)	1.08 (0.88 to 1.33)	1.13 (0.97 to 1.32)	1.35 (1.03 to 1.77)	1.44 (1.13 to 1.83)
Midlands	0.89 (0.80 to 0.98)	0.91 (0.83 to 1.00)	1.09 (0.91 to 1.31)	1.11 (0.96 to 1.27)	1.65 (1.29 to 2.12)	1.44 (1.15 to 1.80)
North East and Yorkshire	1.00 (0.90 to 1.11)	1.02 (0.93 to 1.12)	1.30 (1.08 to 1.56)	1.26 (1.09 to 1.45)	1.59 (1.23 to 2.04)	1.58 (1.26 to 1.97)

Variable *(see Appendix A: Methodology for definition of adjusted odds ratio)*	COPD estimates: Readmitted in 30 days	COPD estimates: Readmitted in 90 days	Adult asthma estimates: Readmitted in 30 days	Adult asthma estimates: Readmitted in 90 days	CYP asthma estimates: Readmitted in 30 days	CYP asthma estimates: Readmitted in 90 days
North West	0.96 (0.86 to 1.06)	0.96 (0.87 to 1.05)	1.01 (0.84 to 1.22)	1.00 (0.87 to 1.16)	1.76 (1.37 to 2.27)	1.67 (1.32 to 2.10)
South East	0.99 (0.89 to 1.11)	1.01 (0.92 to 1.12)	1.28 (1.05 to 1.55)	1.23 (1.06 to 1.42)	1.29 (0.99 to 1.68)	1.18 (0.93 to 1.49)
South West	0.85 (0.75 to 0.96)	0.83 (0.74 to 0.92)	1.18 (0.94 to 1.49)	1.24 (1.04 to 1.47)	1.61 (1.16 to 2.25)	1.74 (1.31 to 2.31)
Wales	0.66 (0.58 to 0.76)	0.67 (0.60 to 0.76)	1.02 (0.78 to 1.32)	0.97 (0.79 to 1.19)	1.58 (1.13 to 2.22)	1.50 (1.10 to 2.04)

Forest plots summarising the data can be viewed here.

2.3 Readmission within 30 and 90 day narrative

The data for adults with COPD show that lower levels of deprivation (IMD quintiles 4 and 5) are associated with reduced readmission to hospital. In contrast, areas with higher levels of deprivation (IMD quintiles 1 and 2) are more likely to have readmissions. The same association is not found within the data for asthma readmissions for adults or children and young people.

Regional variation can be seen within adult asthma with a higher likelihood of readmission in the north-east and south-east of England, as shown in the above table. Within the children and young people asthma data, the likelihood of readmission is comparatively lower in London than other regions in England and in Wales.

Regionally, for COPD, the relationship between mortality and readmission is seen as reciprocal within the data shown. Therefore, by region, areas with higher mortality have lower readmissions and regions with higher readmissions have lower mortality. For example, in Wales the likelihood of death is higher than other regions, whereas the likelihood of readmission is lower. We would expect to see this relationship as, within the same cohort, a greater number of deaths would result in fewer patients requiring readmission to hospital.

For COPD and adult asthma, increasing age and comorbidities show an association with increased likelihood of readmission. Severity of asthma and female gender are also linked to increased readmission within the adult asthma cohort.

Outlier reporting

This outlier report has been completed in accordance with the NRAP outlier policy. Please see the Appendix A: Methodology for further information.

NRAP have categorised outlier status into four core categories:

1. Service has not responded to any outlier communication from NRAP:

The following services did not submit data to the clinical audit report (1 April 2023 – 31 March 2024), nor have they responded to any communication from NRAP

Hospital	Trust (England) / local health board (Wales)	Integrated care system	Region	Country
COPD				
Torbay Hospital	Torbay and South Devon NHS Foundation Trust	Devon	South West	England
PR				
Torbay and South Devon Pulmonary Rehabilitation Programme	Torbay and South Devon NHS Foundation Trust	Together for Devon	South West	England

2. Service has begun re-participating with the audit.

   See Appendix B (ii)
3. Service stated their intention to re-engage with the audit (to be followed up at the end of each reporting quarter).

   See Appendix B (iii)
4. Service has responded to inform NRAP that they are now closed.

   See Appendix B (iv)

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