Royal College of Physicians | NACAP

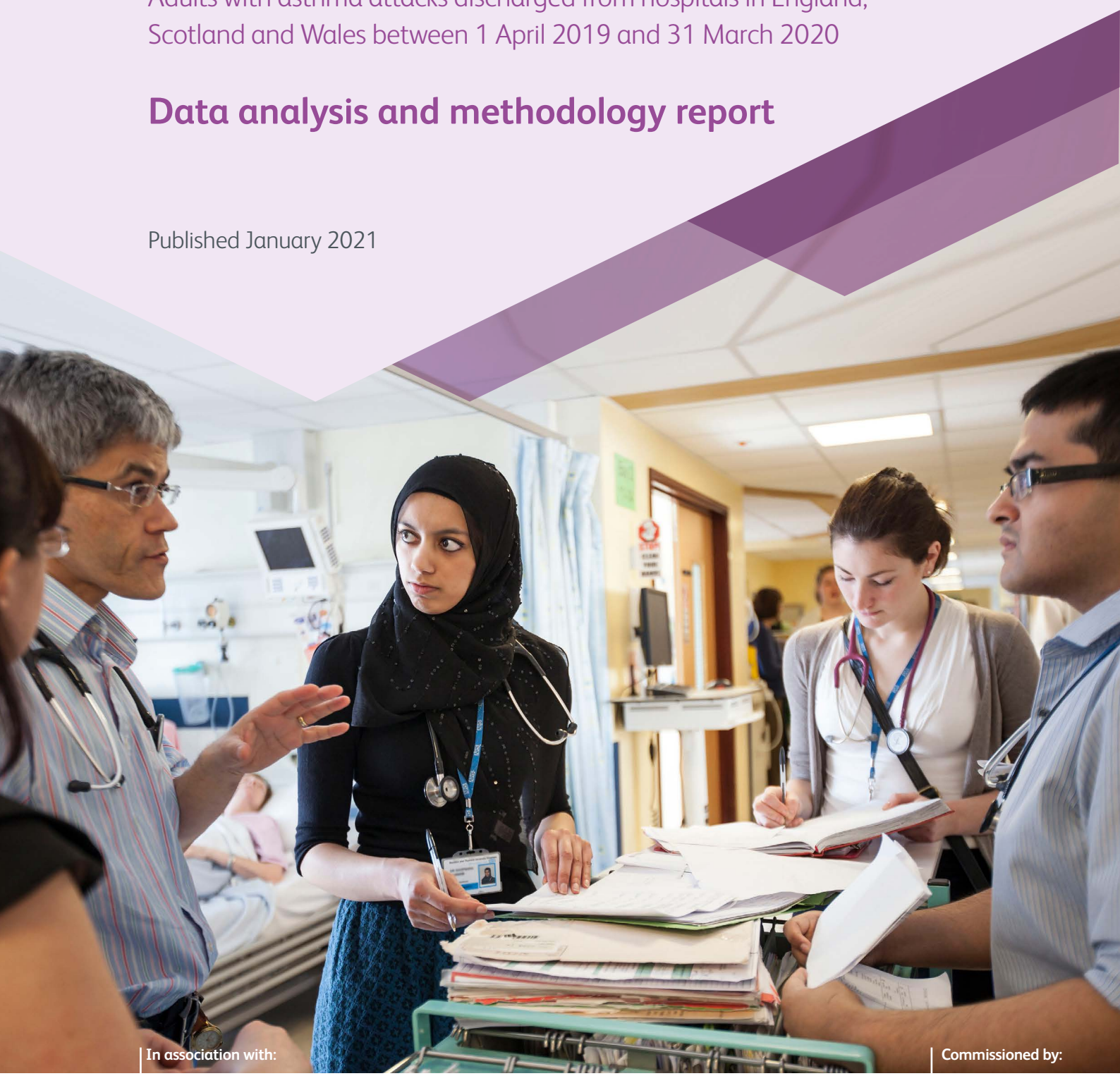
National Asthma and Chronic Obstructive Pulmonary Disease Audit Programme (NACAP)

Adult asthma clinical audit 2019/20

Adults with asthma attacks discharged from hospitals in England, Scotland and Wales between 1 April 2019 and 31 March 2020

Data analysis and methodology report

Published January 2021



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NACAP

NACAP is a programme of work that aims to improve the quality of care, services and clinical outcomes for patients with asthma and COPD in England, Scotland and Wales. Spanning the entire patient care pathway, NACAP includes strong collaboration with asthma and COPD patients, as well as healthcare professionals, and aspires to set out a vision for a service which puts patient needs first. To find out more about the NACAP visit: **www.rcplondon.ac.uk/nacap**.

Adult asthma data analysis and methodology 2019/20 report

This report was prepared by the following people, on behalf of the NACAP asthma advisory group (the full list of members is included on the NACAP resources page: **www.rcplondon.ac.uk/nacap-resources**):

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Contents

How to use this report

1. Scope and data collection

This report presents results of an analysis of data derived from the adult asthma component of the National Asthma and COPD Audit Programme (NACAP). The adult asthma audit is continuous and has been running since 1 November 2018. The audit captures the processes and clinical outcomes of treatment for adult patients admitted with asthma attacks to hospitals in England, Scotland and Wales.

This is the second report to be produced since the launch of the audit and presents data describing the cohort of patients discharged between 1 April 2019 and 31 March 2020.

Contributing to the overarching national quality improvement (QI) objectives of NACAP, this report aims to empower stakeholders to use audit data to facilitate improvements in the quality of care.

2. Report structure

These data are presented largely in tabular form with explanatory notes where appropriate. The key messages can also be found in the national report (via **www.rcplondon.ac.uk/adult-asthma-2019-20**). These data will be made publicly available at hospital level on **www.data.gov.uk**, in line with the government's transparency agenda. Comparisons with the results of the 2018/2019 report (via **www.rcplondon.ac.uk/adult-asthma-201819**) have been provided where appropriate. However, it is important to note that because of the truncated patient cohort for the first round of reporting, 2018/19 figures will naturally be lower than 2019/20 figures.

Details of the statistical, data collection and information governance methodologies used are provided in **Appendix A.**

Nationally benchmarked results for participating hospitals across England, Scotland and Wales have been provided in **Section 8** of the report. The median values for each hospital are presented alongside the national medians for each indicator. Hospital-level results are colour coded in accordance with whether the hospital falls within the upper quartile, the middle two quartiles or the lower quartile.

(This report focuses on the data analysis and methods. Recommendations made in response can be found in the national report (via **www.rcplondon.ac.uk/adult-asthma-2019-20**) and are replicated in **Appendix A** for convenience.)

3. Report coverage

The data presented here are based on 1 full year of audit data collected from hospitals in England, Scotland and Wales who participate in the continuous audit and enter data onto the NACAP web tool.

Hospital participation rates:

- **77.9%** of eligible hospitals in England, Scotland and Wales participated in the audit (173/222 hospitals).
  - England – 86.6% (155/179 hospitals)
  - Scotland – 19.2% (5/26 hospitals)
  - Wales – 76.5% (13/17 hospitals).

Data on **19,360** eligible admissions for patients with asthma attacks were submitted and included in this report. It is important to note that a number of analyses have been calculated using small numbers (for

instance, analyses of inpatient deaths). Caution must be used in interpreting analyses where the sample size is small as analyses may be underpowered and associations seen may occur by chance. Other potential sources of bias exist as patients do not represent a random sample and no case mix adjustment has been undertaken. In addition, because of the truncated patient cohort for the first round of reporting, 2018/19 figures will naturally be lower than 2019/20 figures.

NACAP follows rules on suppression of small numbers in national reporting where it may be possible to identify an individual patient in any data presented. In this report, it was deemed appropriate and safe to include small numbers in national data tables without suppression for the following reasons:

- These data are presented at national aggregate level. It is not possible to combine this national aggregate data in any way which could identify an individual.
- These data are of a sample of the eligible patients that could have been included in the audit; it is not possible to ascertain which eligible patients were included, and which were not, in the data presented here.

However, where service level aggregated data has been presented in the benchmarking table in **Section 8** of this report, small numbers (between 1–4) have been suppressed (with the corresponding percentage also removed) to ensure that the identification of individual patients is not possible.

4. Audience and links to relevant guidelines and standards

The report is intended to be read by healthcare professionals, NHS managers, chief executives and board members, as well as service commissioners, policymakers and voluntary organisations and service users. A separate report has been produced for patients and the public and is available at: **www.rcplondon.ac.uk/adult-asthma-2019-20**

References to the appropriate National Institute for Health and Care Excellence (NICE) quality standards, British Thoracic Society (BTS) / Scottish Intercollegiate Guidelines Network (SIGN) guideline on the management of asthma, and National Review of Asthma Deaths (NRAD) 2014 report recommendations are inserted throughout the key findings.

Additional outputs

- Provider-level aggregated audit data will be made publicly available on **www.data.gov.uk** and on the NACAP web pages, in line with the government's transparency agenda. Providers will be able to use this data to benchmark all reported metrics (all data items) against all participating services.
- Site level reports produced alongside the national reports and provided to individual sites will enable services to benchmark their performance against national results.
- Authorised hospital web tool users (typically members of hospital, respiratory and audit teams who are inputting the data) can download their raw audit data via the audit web tool at any time.
- Run charts for key dataset metrics are also accessible for authorised hospital web tool users to access; these display audit data in real time at provider and national level to support local quality improvement.

Copies of our datasets and all other resources can be found via our website: **www.rcplondon.ac.uk/nacap-adult-asthma**.

Section 1:

Understanding the population

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Navigation

This section contains the following tables and graphs. If you are viewing this report on an electronic device, you can select the table that you wish to see from the list below.

Audit results

Admission and demographics

- A significantly higher proportion of adult patients admitted with **asthma attacks** were female (**71.8%**).
- The **median age** at admission was **48 years.**
- More patients were admitted on **weekdays**, from **late morning to early evening**.
- Fewer patients were admitted overnight (10pm to 8am) and on weekends.*

Length of stay

- The **median length of stay** for an admission was **3 days**.

Inpatient mortality

- **47 (0.2%)** audited patients admitted for asthma attacks died during their hospital stay. For more information on patients that died as an inpatient, see **Section 6.**

Patient numbers included in the audit (case ascertainment)

- The **overall case ascertainment figure** for the period **1 April 2019 to 31 March 2020** was 35.8% (19,360/54,119 admissions).† Case ascertainment was variable across participating hospitals.
- Data presented in the report should be interpreted taking into account that results are based on a non-random sample of eligible patients, rather than the full cohort of eligible individuals.

Hospital participation rates

- **77.9%** of eligible hospitals in England, Scotland and Wales participated in the audit **(173/222 hospitals).** In **England**, hospital participation was **86.6%** (155/179 hospitals). In **Scotland**, hospital participation was **19.2%** (5/26 hospitals). In **Wales**, hospital participation was **76.5%** (13/17 hospitals).

* A detailed breakdown of arrival activity can be found in **Table 1.4.2** of this report (day and time of arrival to hospital)

† This percentage was calculated using admission figures as recorded by Hospital Episode Statistics (HES) for England, the Patient Episode Database for Wales (PEDW) and the electronic Data Research and Innovation Service (eDRIS) for Scotland. (There were a small number of participating hospitals that either did not submit their adult asthma admissions data to HES or their submissions were not coded correctly and therefore could not be allocated). For more information on the methodology used to calculate this figure, please review **Appendix B**.

1.1 Age

	2019/20				2018/19
Age at arrival	England (N=18,290)	Scotland (N=166)	Wales (N=904)	All (N=19,360)	All (N=10,242)
Median (IQR*)	48 (33 to 63)	55 (36 to 70)	48 (33 to 62)	48 (33 to 63)	50 (34 to 65)

**Interquartile range*

1.2 Gender

	2019/20				2018/19
Gender	England (N=18,257)	Scotland (N=166)	Wales (N=903)	All (N=19,326)	All (N=10,242)
Male	5,188 (28.4%)	39 (23.5%)	220 (24.4%)	5,447 (28.2%)	2,803 (27.4%)
Female	13,064 (71.6%)	127 (76.5%)	683 (75.6%)	13,874 (71.8%)	7,424 (72.5%)
Transgender	5 (<0.1%)	0 (0.0%)	0 (0.0%)	5 (<0.1%)	5 (<0.1%)
Other	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Not recorded / preferred not to say	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	10 (0.1%)

1.3 Socioeconomic status

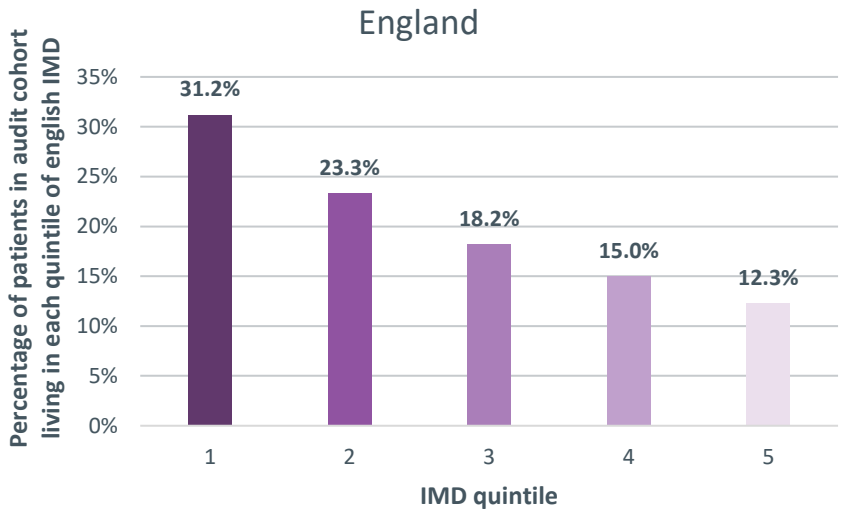
1.3.1 Index of Multiple Deprivation measures by national quintile in England, Scotland and Wales

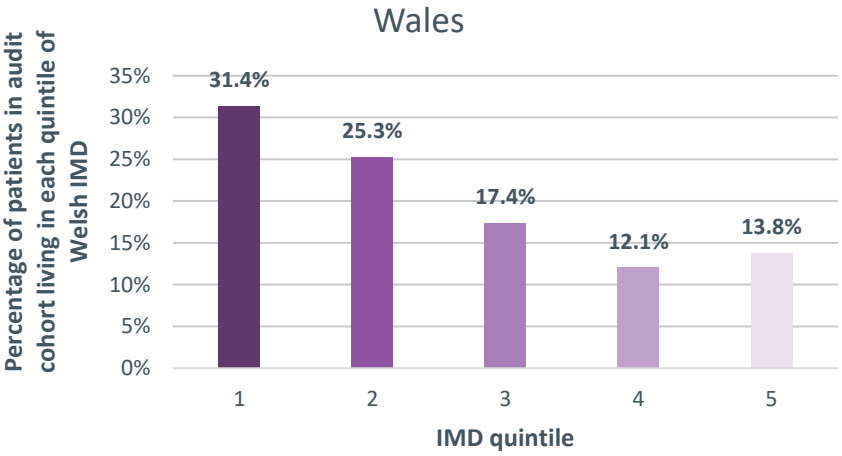
		% of audit sample living in each quintile of English, Scottish or Welsh Index of Multiple Deprivation				
Index of Multiple Deprivation		Q1 (most deprived)	Q2	Q3	Q4	Q5 (least deprived)
2019/20	England (IMD*) (N=17,925)	5,587 (31.2%)	4,177 (23.3%)	3,267 (18.2%)	2,692 (15.0%)	2,202 (12.3%)
	Wales (WIMD**) (N=908)	280 (30.8%)	228 (25.1%)	158 (17.4%)	114 (12.6%)	128 (14.1%)
	Scotland (SIMD***) (N=158)	54 (34.2%)	43 (27.2%)	31 (19.6%)	17 (10.8%)	13 (8.2%)
2018/19	England (IMD) (N=9,505)	2,829 (29.8%)	2,136 (22.5%)	1,834 (19.3%)	1,468 (15.4%)	1,238 (13.0%)
	Wales (WIMD) (N=447)	127 (28.4%)	84 (18.8%)	94 (21.0%)	52 (11.6%)	90 (20.1%)

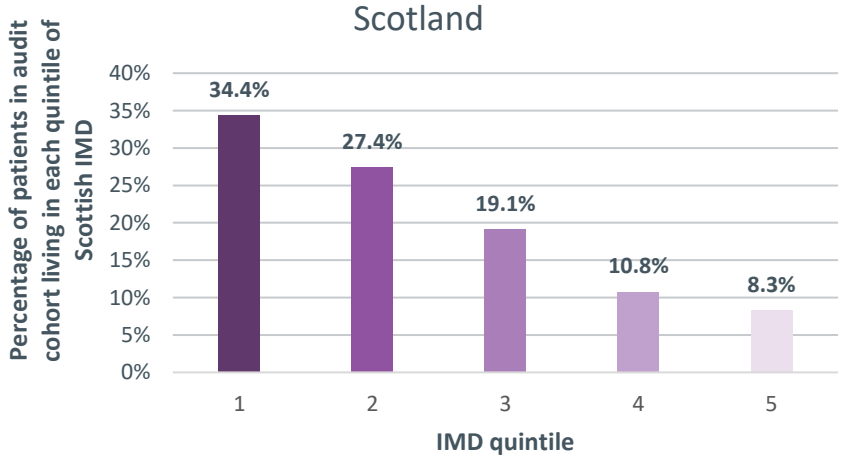
**Index of Multiple Deprivation, England **Welsh Index of Multiple Deprivation ***Scottish Index of Multiple Deprivation*

> Please note when reviewing these data that indices of multiple deprivation are not directly comparable between England, Scotland and Wales.

Fig 1. Percentage of the audit cohort in each IMD quintile in England, Wales and Scotland







1.4 Arrival at hospital

1.4.1 Median number of admissions per hospital

	2019/20				2018/19
Number of admissions	England (N=18,290)	Scotland (N=166)	Wales (N=904)	All (N=19,360)	All (N=10,242)
Median (IQR)	101 (58 to 164)	42 (6 to 50)	62 (28 to 97)	96 (53 to 158)	52 (28 to 83)

1.4.2 Day and time of arrival at hospital (all)

	2019/20: Day patient arrived (N=19,360)						
Time of arrival	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
	(N=3,501)	(N=2,899)	(N=2,834)	(N=2,905)	(N=2,542)	(N=2,129)	(N=2,550)
00.00–01.59	131 (3.7%)	123 (4.2%)	121 (4.3%)	133 (4.6%)	133 (5.2%)	95 (4.5%)	138 (5.4%)
02.00–03.59	116 (3.3%)	94 (3.2%)	107 (3.8%)	86 (3.0%)	91 (3.6%)	107 (5.0%)	101 (4.0%)
04.00–05.59	130 (3.7%)	89 (3.1%)	92 (3.2%)	93 (3.2%)	79 (3.1%)	100 (4.7%)	122 (4.8%)
06.00–07.59	129 (3.7%)	106 (3.7%)	97 (3.4%)	94 (3.2%)	82 (3.2%)	92 (4.3%)	120 (4.7%)
08.00–09.59	250 (7.1%)	206 (7.1%)	205 (7.2%)	221 (7.6%)	165 (6.5%)	139 (6.5%)	197 (7.7%)
10.00–11.59	554 (15.8%)	407 (14.0%)	388 (13.7%)	399 (13.7%)	349 (13.7%)	256 (12.0%)	272 (10.7%)
12.00–13.59	557 (15.9%)	410 (14.1%)	389 (13.7%)	395 (13.6%)	365 (14.4%)	228 (10.7%)	299 (11.7%)
14.00–15.59	371 (10.6%)	324 (11.2%)	327 (11.5%)	326 (11.2%)	290 (11.4%)	211 (9.9%)	278 (10.9%)
16.00–17.59	410 (11.7%)	394 (13.6%)	354 (12.5%)	382 (13.1%)	308 (12.1%)	210 (9.9%)	260 (10.2%)
18.00–19.59	360 (10.3%)	358 (12.3%)	303 (10.7%)	343 (11.8%)	277 (10.9%)	229 (10.8%)	263 (10.3%)
20.00–21.59	302 (8.6%)	219 (7.6%)	252 (8.9%)	232 (8.0%)	201 (7.9%)	237 (11.1%)	285 (11.2%)
22.00–23.59	191 (5.5%)	169 (5.8%)	199 (7.0%)	201 (6.9%)	202 (7.9%)	225 (10.6%)	215 (8.4%)

Key: Lowest (3.1%) — Highest (15.9%)

Red boxes denote the times when arrival activity was highest, whilst green boxes denote the times when arrival activity was lowest.

1.5 Length of stay‡

	2019/20				2018/19
Length of stay, days	England (N=18,250)	Scotland (N=164)	Wales (N=899)	All (N=19,313)	All (N=10,219)
Median (IQR)	3 (1 to 5)	3 (2 to 6)	2 (1 to 5)	3 (1 to 5)	3 (1 to 5)

‡ The denominator excludes patients who died as inpatients.

Section 2:
Good practice care on arrival to hospital

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Navigation

This section contains the following tables and graphs. If you are viewing this report on an electronic device, you can select the table that you wish to see from the list below.

2.1. Baseline observations

Key standards – baseline observations:

NICE 2013 QS25 [QS7]: People with asthma who present with an exacerbation of their symptoms receive an objective measurement of severity at the time of presentation.[4]

Audit results – baseline observations:

- The median values for first recorded observations were as follows:
  - heart rate of **101 beats per minute**
  - **respiratory rate** of **22 breaths per minute**
  - **SpO_2 measurement of 96%** (this measurement was taken while patients were on room air in **72.8%** of cases).

2.1.1 Heart rate

2.1.1a What was the first recorded heart rate for the patient following arrival at hospital?

	2019/20				2018/19
Heart rate on arrival	England (N=18,290)	Scotland (N=166)	Wales (N=904)	All (N=19,360)	All (N=10,242)
Median (IQR)	101 (88 to 116)	102 (89 to 117)	100 (87 to 114)	101 (88 to 116)	102 (89 to 117)

2.1.2 Respiratory rate

2.1.2a What was the first recorded respiratory rate for the patient following arrival at hospital?

	2019/20	2018/19			
Respiratory rate on arrival	England (N=18,290)	Scotland (N=166)	Wales (N=904)	All (N=19,360)	All (N=10,242)
Median (IQR)	22 (20 to 26)	22 (19 to 27)	22 (20 to 26)	22 (20 to 26)	22 (20 to 26)

2.1.3 Oxygen saturation (SpO_2)

2.1.3a Did the patient have an SpO_2 measurement taken following arrival at hospital?

	2019/20				2018/19
SpO_2 on arrival	England (N=18,290)	Scotland (N=166)	Wales (N=904)	All (N=19,360)	All (N=10,242)
Yes	18,169 (99.3%)	166 (100.0%)	902 (99.8%)	19,237 (99.4%)	10,159 (99.2%)
Not recorded	121 (0.7%)	0 (0.0%)	2 (0.2%)	123 (0.6%)	83 (0.8%)

2.1.3b What was the first recorded SpO_2 measurement for the patient following arrival at hospital?

	2019/20				2018/19
SpO_2 (%) on arrival	England (N=18,169)	Scotland (N=166)	Wales (N=902)	All (N=19,237)	**All (N=10,159)**
Median (IQR)	96 (94 to 98)	96 (93 to 98)	96 (94 to 98)	96 (94 to 98)	96 (94 to 98)

2.1.3c Was the measurement taken while the patient was on supplementary oxygen?

	2019/20				2018/19
SpO_2 while on supplementary oxygen	**England (N=18,169)**	**Scotland (N=166)**	**Wales (N=902)**	**All (N=19,237)**	**All (N=10,159)**
Yes	3,786 (20.8%)	41 (24.7%)	131 (14.5%)	3,958 (20.6%)	2,048 (20.2%)
No, room air	13,148 (72.4%)	122 (73.5%)	742 (82.3%)	14,012 (72.8%)	7,510 (73.9%)
Not recorded	1,235 (6.8%)	3 (1.8%)	29 (3.2%)	1,267 (6.6%)	601 (5.9%)

2.2 Peak expiratory flow (PEF)

Key standards – PEF:

- BTS/SIGN 2019 [9.2.3]: Measurements of airway calibre improve recognition of the degree of severity, the appropriateness or intensity of therapy, and decisions about management in hospital or at home. PEF or FEV1 (forced expiratory volume in 1 second) are useful and valid measures of airway calibre. PEF is more convenient in the acute situation.[1]
- BTS/SIGN 2019 [9.2.6]: Patients whose PEF is greater than 75% best or predicted 1 hour after initial treatment may be discharged from the emergency department (ED) unless they meet any of the following criteria, when admission may be appropriate: still have significant symptoms; concerns about adherence; living alone / socially isolated; psychological problems; physical disability or learning difficulties; previous near-fatal asthma attack; asthma attack despite adequate dose of oral corticosteroid prior to presentation; presentation at night; pregnancy.[1]
- NICE 2013 QS25 [QS7]: People with asthma who present with an exacerbation of their symptoms receive an objective measurement of severity at the time of presentation.[4]

Audit results – PEF:

- **74.6%** of patients had a **recorded PEF measurement** while **21.2%** had **no PEF measurement** recorded during their admission and **4.1%** of patients **were too unwell to have a measurement taken**.
- The **median time to PEF measurement** following arrival at hospital was **3.5 hours** (IQR 0.8–15.4 hours).
- **28.3%** of all patients with a PEF measurement, and a time for their measurement, **had PEF taken within 1 hour of arrival**.
- **52.9%** of all patients with a PEF measurement, and a time for their measurement, **had PEF taken within 4 hours of arrival**.
- **60%** of patients had a **previous best PEF recorded**. Where a **previous best PEF was not recorded**, **34.2%** of admissions had a **predicted PEF recorded**.
- Of the patients who had a recorded PEF measurement taken, **85.2% had a record of either previous or predicted PEF**.
- The **median PEF on admission** as a percentage of previous best PEF or predicted PEF was **60%** (IQR 45–75%).
- **74.4%** of patients who had a PEF measurement taken and a measurement for either best/predicted PEF had a **PEF measurement of less than 75% as a percentage of best/predicted PEF** following arrival.

National QI priority: Ensure 90% of patients are assessed for asthma severity, including measurement of PEF within 1 hour of arrival. **(BTS/SIGN 2019 [9.2.3, 9.2.6])**

Rationale:

There is low attainment nationally for measurement of PEF within 1 hour of arrival. Assessment of severity by PEF measurement is required in order to make the necessary care management plans for the patient's admission **(BTS/SIGN 2019 [9.2.3, 9.2.6]).** Therefore, a 90% QI target has been set, taking into account exception cases where this cannot be recorded (ie where the patient is too unwell).[§]

Processes should be put in place to ensure that information on PEF is collected in a timely manner. Current measures to prevent aerosol generating procedures while in hospital as a result of the COVID-19 pandemic mean that assessment of PEF is more problematic than previously, but the need to ensure accurate assessment of severity of asthma on admission means it remains an important measure.

Tips to achieve this priority:

- Survey staff to understand the barriers to measuring PEF in the emergency department.
- Review whether there is sufficient availability of PEF meters in the emergency department, particularly during the busiest periods for admissions (see Table 1.4.2 of the data analysis and methodology report (day and time of arrival to hospital)).
- Provide education and training to staff on PEF measurement and interpretation.
- Encourage use of PEF as part of triage by mandating entry of PEF measurement in electronic systems.
- Work with the ambulance service to include PEF measurement as part of initial assessment.
- Liaise with infection control teams to design processes to permit PEF measurement.

[§] 4.1% of audited patients were too unwell to have a PEF measurement taken (see Table 2.2.1).

2.2.1 Did the patient have a PEF measurement following arrival at hospital?[**]

	2019/20				2018/19
PEF on arrival	England (N=18,290)	Scotland (N=166)	Wales (N=904)	All (N=19,360)	All (N=10,242)
Yes	13,591 (74.3%)	130 (78.3%)	729 (80.6%)	14,450 (74.6%)	7,436 (72.6%)
Patient too unwell	761 (4.2%)	8 (4.8%)	31 (3.4%)	800 (4.1%)	395 (3.9%)
Not recorded	3,938 (21.5%)	28 (16.9%)	144 (15.9%)	4,110 (21.2%)	2,411 (23.5%)

2.2.2 Median time, in hours, from arrival at hospital to PEF measurement[††]

	2018/19				2018/19
Median time to PEF measurement	England (N=12,239)	Scotland (N=112)	Wales (N=647)	All (N=12,998)	All (N=6,441)
Median (IQR)	3.5 (0.8 to 15.4)	4.2 (0.4 to 19)	2.8 (0.6 to 11.6)	3.5 (0.8 to 15.4)	4 (1 to 16)

2.2.3 Number of patients with a PEF measurement taken within 1 hour of arrival at hospital[‡‡]

	2019/20				2018/19
Time to PEF	England (N=12,239)	Scotland (N=112)	Wales (N=647)	All (N=12,998)	All (N=6,441)
PEF taken within 1 hour	3,416 (27.9%)	38 (33.9%)	220 (34.0%)	3,674 (28.3%)	1,797 (27.9%)

2.2.4 Number of patients with a PEF measurement taken within 4 hours of arrival at hospital[§§]

	2019/20				2018/19
Time to PEF	England (N=12,239)	Scotland (N=112)	Wales (N=647)	All (N=12,998)	All (N=6,441)
PEF taken within 4 hours	6,445 (52.7%)	55 (49.1%)	377 (58.3%)	6,877 (52.9%)	3,398 (52.8%)

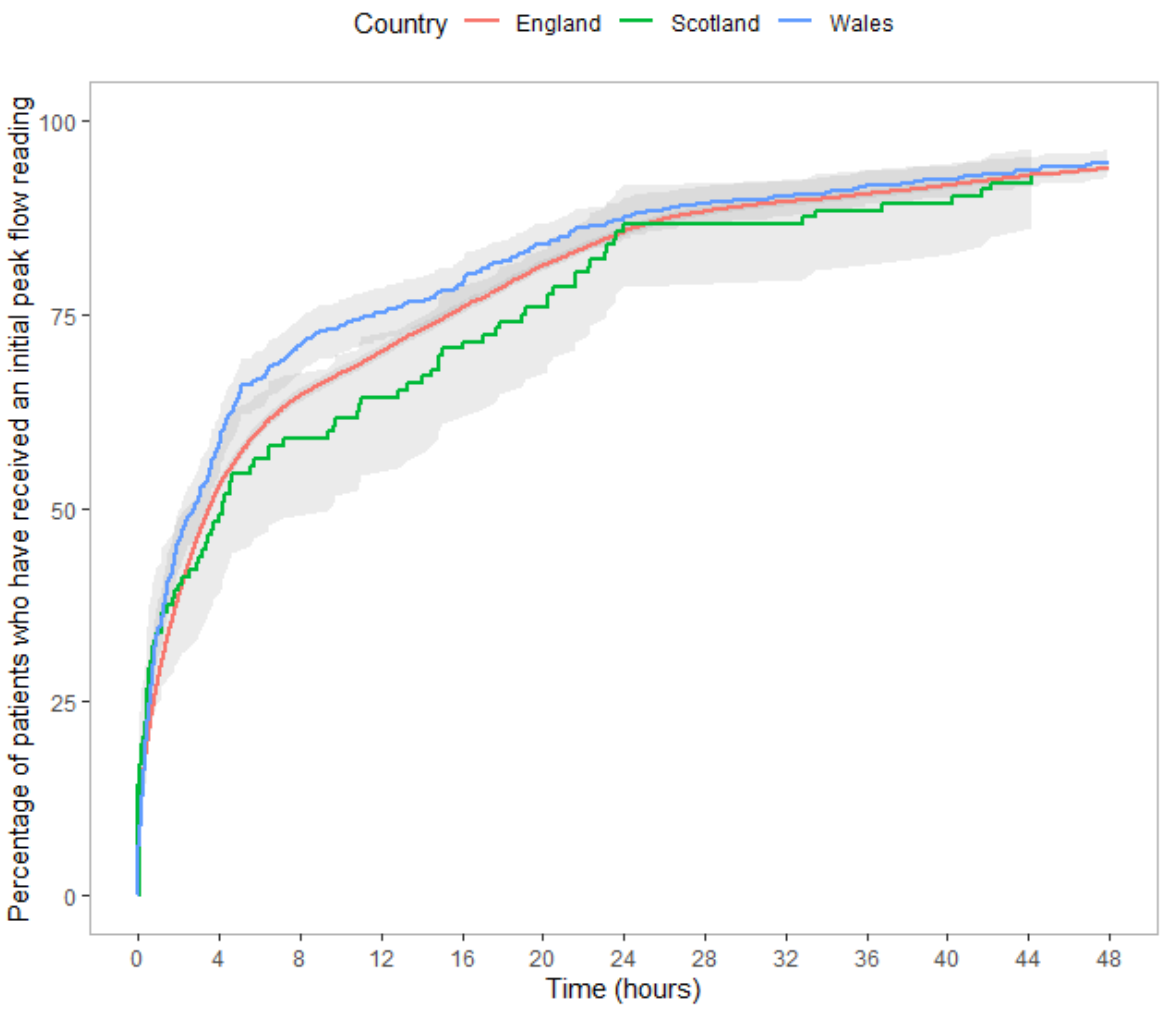
[**] The exact wording of the question in the clinical audit dataset was: *What was the first recorded peak expiratory flow measurement (PEF) for the patient following arrival at hospital?*

[††] Only records with a recorded date and time to PEF measurement were included in this analysis.

[‡‡] Only records with a recorded date and time to PEF measurement were included in this analysis.

[§§] Only records with a recorded date and time to PEF measurement were included in this analysis.

Fig 2. Cumulative percentage of patients who received a PEF measurement following arrival at hospital



2.2.5 Percentage of patients with a PEF measurement by day and time of arrival***

Time of arrival	2019/20: Day of arrival (N=18,560)						
	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
	(N=3,360)	(N=2,792)	(N=2,734)	(N=2,787)	(N=2,419)	(N=2,034)	(N=2,434)
00.00–01.59	97 (77.0%)	90 (76.3%)	94 (79.0%)	96 (76.2%)	93 (75.0%)	65 (70.7%)	104 (77.0%)
02.00–03.59	92 (81.4%)	74 (82.2%)	85 (81.7%)	69 (83.1%)	67 (77.9%)	72 (70.6%)	68 (72.3%)
04.00–05.59	99 (82.5%)	65 (76.5%)	70 (81.4%)	66 (78.6%)	56 (72.7%)	67 (72.0%)	88 (80.0%)
06.00–07.59	102 (81.6%)	86 (82.7%)	69 (74.2%)	75 (82.4%)	57 (74.0%)	66 (75.0%)	90 (77.6%)
08.00–09.59	193 (79.4%)	170 (85.4%)	149 (76.0%)	171 (80.7%)	118 (77.6%)	99 (75.6%)	142 (76.3%)
10.00–11.59	422 (78.6%)	317 (80.5%)	305 (81.6%)	305 (78.0%)	257 (76.3%)	197 (80.4%)	209 (78.6%)
12.00–13.59	409 (77.5%)	309 (78.6%)	301 (80.5%)	292 (77.0%)	265 (74.9%)	164 (74.2%)	216 (75.3%)
14.00–15.59	273 (78.0%)	260 (81.5%)	242 (76.1%)	243 (78.4%)	200 (72.2%)	150 (74.6%)	217 (82.2%)
16.00–17.59	302 (75.7%)	283 (75.1%)	265 (78.2%)	276 (75.2%)	217 (74.3%)	149 (74.9%)	195 (78.9%)
18.00–19.59	275 (78.8%)	271 (79.0%)	231 (78.0%)	266 (79.6%)	196 (74.8%)	165 (76.4%)	200 (78.7%)
20.00–21.59	217 (75.1%)	162 (79.0%)	192 (79.7%)	176 (80.4%)	145 (75.5%)	179 (77.8%)	204 (75.3%)
22.00–23.59	138 (76.2%)	134 (81.2%)	154 (79.4%)	154 (80.6%)	147 (77.8%)	175 (81.0%)	165 (80.9%)

> Please note that for this table, red boxes denote the times when a patient was least likely to have a PEF measurement taken following arrival at hospital, while green boxes denote the times when a patient was most likely to have a PEF measurement taken following arrival at hospital.

*** Only records with a recorded date and time of PEF measurement were included in this analysis.

2.2.6 Did the patient have a previous best PEF recorded?[†††]

	2019/20				2018/19
Previous best PEF	**England (N=18,290)**	**Scotland (N=166)**	**Wales (N=904)**	**All (N=19,360)**	**All (N=10,242)**
Yes	10,976 (60.0%)	82 (49.4%)	551 (61.0%)	11,609 (60.0%)	6,008 (58.7%)

2.2.7 If previous best PEF was not recorded, did the patient have a predicted PEF calculated?[‡‡‡]

	2019/20				2018/19
Predicted PEF	**England (N=7,314)**	**Scotland (N=84)**	**Wales (N=353)**	**All (N=7,751)**	**All (N=4,234)**
Yes	2,525 (34.5%)	39 (46.4%)	84 (23.8%)	2,648 (34.2%)	1,416 (33.4%)

2.2.8 Number of patients with a record of either previous PEF or predicted PEF, if PEF measurement taken following arrival

	2019/20				2018/19
Previous best or predicted PEF recorded	**England (N=13,591)**	**Scotland (N=130)**	**Wales (N=729)**	**All (N=14,450)**	**All (N=7,436)**
Recorded	11,614 (85.5%)	103 (79.2%)	593 (81.3%)	12,310 (85.2%)	6,295 (84.7%)

2.2.9 PEF recorded on admission as a percentage of best PEF or predicted PEF

	2019/20				2018/19
PEF recorded on admission as a percentage of best/ predicted PEF	**England (N=11,614)**	**Scotland (N=103)**	**Wales (N=593)**	**All (N=12,310)**	**All (N=6,295)**
Median % predicted PEF (IQR)	60 (45 to 75)	60 (50 to 75)	61 (47 to 75)	60 (45 to 75)	60.0 (46 to 75)
Admitted with PEF <75%	8,641 (74.4%)	76 (73.8%)	438 (73.9%)	9,155 (74.4%)	4,679 (74.3%)

[†††] The exact wording of the question in the clinical audit dataset was: *What was the patient's previous best PEF?*
[‡‡‡] The exact wording of the question in the clinical audit dataset was*: If previous best PEF = 'Not recorded' please give predicted PEF.*

2.3 Respiratory specialist review

Key standards – respiratory review:

> NICE 2013 QS25 [QS9]: People admitted to hospital with an acute exacerbation of asthma have a structured review by a member of a specialist respiratory team before discharge.[4]

Audit results – respiratory specialist review:

> Patients were judged to have had a respiratory specialist review if they were seen by any member of the respiratory multidisciplinary team (MDT) with training and skills in care of patients with asthma. **81.1%** of patients were **reviewed by a respiratory specialist** at some point during their admission.
> The **median time to respiratory specialist review** was **19.3 hours** (IQR 10.8–32.5 hours). The result in 2018/19 was 20 hours (IQR 11–36 hours).
> **68.4%** of patients who received a respiratory specialist review on a weekday were **reviewed within 24 hours** of arrival to hospital.
> **56.0%** of patients who received a respiratory specialist review during a weekend were **reviewed within 24 hours** of arrival to hospital.

National QI priority: Ensure 90% of patients receive a respiratory specialist review during hospital admission. **(NICE 2013 QS25 [QS9])**

Timely access to / review by a respiratory specialist is the **patient priority for the adult asthma clinical audit**, as chosen by the NACAP patient panel. For more information on how this priority was selected, please visit: **www.rcplondon.ac.uk/nacap**.

Rationale:

The audit data highlights that patients in receipt of a respiratory specialist review were more likely to receive an asthma care bundle and the associated elements of good practice care on discharge, as well as more likely to have their tobacco dependency addressed if a current smoker. Therefore, an ambitious 90% QI target has been set for this priority.

Tips to achieve this priority:

> Work with the admitting medical teams to put a simple system in place whereby the respiratory team can be notified of new patients at the point of admission.
> Work with the local IT department to set up an alert system to support identification of relevant patients for review.
> Undertake a respiratory round of the admitting ward(s) and the emergency department each morning.

2.3.1 Was the patient reviewed by a respiratory specialist during their admission?

	2019/20				2018/19
Respiratory specialist review	England (N=18,290)	Scotland (N=166)	Wales (N=904)	All (N=19,360)	All (N=10,242)
Yes	14,970 (81.8%)	157 (94.6%)	583 (64.5%)	15,710 (81.1%)	7,870 (76.8%)

2.3.2 Median time, in hours, from arrival at hospital to review by a respiratory specialist

	2019/20				2018/19
Median time to review by respiratory specialist (hours)	England (N=14,970)	Scotland (N=157)	Wales (N=583)	All (N=15,710)	All (N=7,870)
Median (IQR)	19.2 (10.8 to 31.8)	19.3 (14.7 to 28.7)	21.2 (11.4 to 45.7)	19.3 (10.8 to 32.5)	20 (10.8 to 35.7)

2.3.3 Number of patients with a specialist respiratory review within 24 hours of arrival at hospital

	2019/20			
	England (N=10,315)	Scotland (N=109)	Wales (N=412)	All (N=10,836)
Specialist respiratory review within 24 hours (weekdays, Monday 08.00 – Friday 17.00)	7,078 (68.6%)	87 (79.8%)	246 (59.7%)	7,411 (68.4%)

	2019/20			
	England (N=4,655)	Scotland (N=48)	Wales (N=171)	All (N=4,874)
Specialist respiratory review within 24 hours (weekends, Friday 17.00 – Monday 08.00)	2,627 (56.4%)	19 (39.6%)	85 (49.7%)	2,731 (56.0%)

2.4 Oxygen prescription and administration

Key standards – oxygen prescription and administration:

- BTS 2017 [Guideline for oxygen use in healthcare and emergency settings]: Every healthcare facility should have a standard oxygen prescription document or, preferably, a designated oxygen section on all drug-prescribing cards or guided prescription of oxygen in electronic prescribing systems.[5]
- BTS 2017 [Guideline for oxygen use in healthcare and emergency settings]: A prescription for oxygen should always be provided, except in sudden illness when it must be started immediately and documented retrospectively.[5]

Audit results – oxygen prescription and administration:

- Oxygen should be prescribed to ensure patients are managed safely. However, the audit data shows **16.5%** of patients **were administered oxygen without a prescription.**
- **22.5%** of patients were **both prescribed and administered oxygen.**
- **18.1%** of patients were **prescribed but not administered oxygen.**
- **42.9%** of patients were **not prescribed or administered oxygen.**

Respiratory teams should continue to advocate within their organisations for oxygen to be treated like any other medication and an incident form raised where oxygen is administered without a prescription except in an emergency.

2.4.1 Was oxygen prescribed for / administered to the patient at any point during admission?

	2019/20				2018/19
Oxygen prescription and administration	**England (N=18,290)**	**Scotland (N=166)**	**Wales (N=904)**	**All (N=19,360)**	**All (N=10,242)**
Prescribed only	3,346 (18.3%)	19 (11.4%)	139 (15.4%)	3,504 (18.1%)	1,752 (17.1%)
Administered only	3,036 (16.6%)	39 (23.5%)	121 (13.4%)	3,196 (16.5%)	1,720 (16.8%)
Prescribed and administered	4,031 (22.0%)	55 (33.1%)	261 (28.9%)	4,347 (22.5%)	2,325 (22.7%)
No	7,877 (43.1%)	53 (31.9%)	383 (42.4%)	8,313 (42.9%)	4,445 (43.4%)

2.5 Systemic steroids (oral and IV) and β_2 agonists

Key standards – systemic steroids:

- BTS/SIGN 2019 [2.7.1, 9.3.3]: Give steroids in adequate doses to all patients with an acute asthma attack.[1]
- NICE 2013 QS25 [QS8]: People aged 5 years or older presenting to a healthcare professional with a severe or life-threatening acute exacerbation of asthma receive oral or intravenous steroids within 1 hour of presentation.[4]

Key standards – β_2 agonists:

- BTS/SIGN 2019 [2.7.1, 9.3.2]: Use high-dose inhaled β_2 agonists as first-line agents in patients with acute asthma and administer as early as possible. Reserve intravenous β_2 agonists for those patients in whom inhaled therapy cannot be used reliably.[1]

Audit results – systemic steroids:

- **87.4%** of patients were **administered systemic steroids** following arrival at hospital.
- **30.6%** of all patients who received systemic steroids as an inpatient received these **within 1 hour** of arrival at hospital.
- **65.8%** of all patients who received systemic steroids as an inpatient received these **within 4 hours** of arrival at hospital.
- There did not appear to be an association between receiving systemic steroids within 1 hour of admission to hospital and length of stay (OR = 0.99, 95% CI 0.93 to 1.06).[§§§]

Audit results – β_2 agonists:

- **91.2%** of patients were **administered β_2 agonists** (inhaled or intravenous (IV)) following arrival at hospital.
- **40.9%** of all patients who received β_2 agonists (inhaled or IV) as an inpatient received these **within 1 hour** of arrival to hospital.
- **78.4%** of all patients who received β_2 agonists (inhaled or IV) as an inpatient received these **within 4 hours** of arrival at hospital.
- Although the administration of β_2 agonists relieves asthma symptoms, there did not appear to be an association between receiving β_2 agonists within 1 hour of admission to hospital and length of stay (OR = 1.00, 95% CI 0.95 to 1.07).

Caveats to systemic steroids and β_2 agonists audit data:

- The audit dataset does not record pre-hospital care, so it is possible that some patients received their first dose of systemic steroids and β_2 agonists in primary care or in the ambulance. Data on time of administration of systemic steroids and β_2 agonists should be interpreted with this caveat.
- Early administration of systemic steroids is associated with better outcomes.[9] It is our intention to add a question to a revised adult asthma audit dataset on pre-hospital care. This will allow us to better understand whether patients are receiving timely emergency care.
- The analysis has not been adjusted for confounders such as age, asthma severity or comorbidities, which could affect both, time to receipt of systemic steroids or β_2 agonists and length of stay.

[§§§] A Cochrane Review has shown that use of corticosteroids within 1 hour of presentation to an emergency department significantly reduces the need for hospital admission in patients with acute asthma. Benefits appear to be greatest in patients with more severe asthma, and those not currently receiving steroids. (Rowe BH, Spooner C, Ducharme F *et al*. Early emergency department treatment of acute asthma with systemic corticosteroids. *Cochrane Database Syst Rev* 2001;1:CD002178.

3

National QI priority: Ensure 95% of patients who have not been administered systemic steroids as part of pre-hospital care are administered this treatment within 1 hour of arrival to hospital. (**NICE 2013 QS25 [QS8]**)

Rationale:

Early administration of systemic steroids for asthma attacks is associated with better patient outcomes.[9] The audit data suggests that administration of systemic steroids within 4 hours of arrival to hospital is associated with reduced length of stay. Therefore, a 95% QI target has been set, taking into account exceptional cases where systemic steroids cannot be administered.

Tips to achieve this priority:

- Incorporate a clear record of any pre-hospital systemic steroid treatment into the ambulance handover or pre-admission triage to avoid delay in treatment with steroids or duplication of treatment on arrival to hospital.
- Ensure that all emergency department staff are aware of the importance of steroid administration within 1 hour.

2.5.1a Was the patient administered systemic steroids following arrival at hospital?

	2019/20				2018/19
Systemic steroids on arrival	**England (N=18,290)**	**Scotland (N=166)**	**Wales (N=904)**	**All (N=19,360)**	**All (N=10,242)**
Yes	16,069 (87.9%)	139 (83.7%)	714 (79.0%)	16,922 (87.4%)	8,986 (87.7%)
Not administered	1,310 (7.2%)	16 (9.6%)	68 (7.5%)	1,394 (7.2%)	694 (6.8%)
Not recorded	911 (5.0%)	11 (6.6%)	122 (13.5%)	1,044 (5.4%)	562 (5.5%)

2.5.1b Median time, in hours, from arrival at hospital to administration of systemic steroids

	2019/20				2018/19
Median time, in hours, from arrival to administration of systemic steroids	**England (N=16,069)**	**Scotland (N=139)**	**Wales (N=714)**	**All (N=16,922)**	**All (N=8,986)**
Median (IQR)	2.2 (0.8 to 6.6)	2 (0.8 to 10.5)	2.7 (1.1 to 6.1)	2.2 (0.8 to 6.6)	2 (1 to 7)

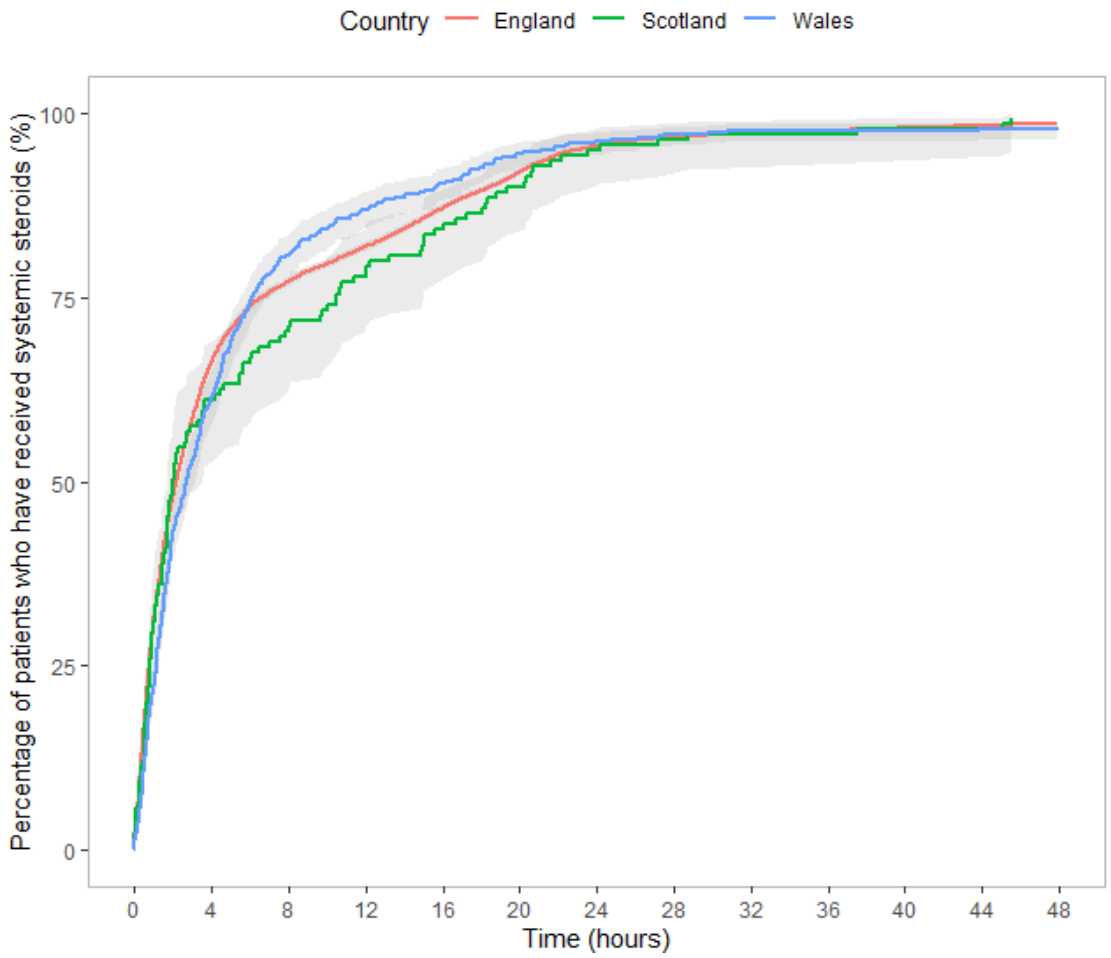
2.5.1c Number of patients receiving systemic steroids within 1 hour of arrival at hospital

	2019/20				2018/19
Systemic steroids within 1 hour	**England (N=16,069)**	**Scotland (N=139)**	**Wales (N=714)**	**All (N=16,922)**	**All (N=8,986)**
Received within 1 hour	4,976 (31.0%)	43 (30.9%)	156 (21.8%)	5,175 (30.6%)	2,808 (31.2%)

2.5.1d Number of patients receiving systemic steroids within 4 hours of arrival at hospital

	2019/20				2018/19
Systemic steroids within 4 hours	**England (N=16,069)**	**Scotland (N=139)**	**Wales (N=714)**	**All (N=16,922)**	**All (N=8,986)**
Received within 4 hours	10,618 (66.1%)	85 (61.2%)	437 (61.2%)	11,140 (65.8%)	5,870 (65.3%)

Fig 3. Cumulative percentage of patients who received systemic steroids following arrival at hospital



2.5.1e Percentage of patients who received systemic steroids within 1 hour by day and time of arrival

	2019/20: Day of arrival (N=16,922)						
Time of arrival	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
	(N=3,028)	(N=2,536)	(N=2,472)	(N=2,522)	(N=2,181)	(N=1,904)	(N=2,279)
00.00–01.59	36 (30.5%)	30 (27.3%)	34 (32.1%)	44 (38.3%)	43 (34.7%)	30 (34.1%)	45 (37.5%)
02.00–03.59	30 (28.0%)	32 (37.2%)	29 (29.9%)	23 (28.7%)	30 (36.6%)	28 (29.2%)	33 (37.1%)
04.00–05.59	46 (38.7%)	26 (32.5%)	33 (39.3%)	39 (48.8%)	25 (34.7%)	39 (42.4%)	40 (35.1%)
06.00–07.59	41 (33.6%)	33 (35.9%)	35 (38.9%)	32 (37.2%)	32 (40.5%)	28 (33.7%)	39 (34.8%)
08.00–09.59	93 (42.9%)	62 (34.8%)	67 (38.5%)	75 (38.3%)	67 (45.9%)	42 (34.4%)	60 (34.1%)
10.00–11.59	147 (32.8%)	118 (35.4%)	110 (34.0%)	99 (30.2%)	91 (32.5%)	76 (32.8%)	80 (33.9%)
12.00–13.59	123 (26.2%)	93 (26.7%)	101 (30.6%)	81 (24.8%)	78 (25.4%)	56 (29.0%)	66 (26.0%)
14.00–15.59	68 (21.2%)	84 (29.7%)	71 (25.3%)	80 (27.9%)	65 (28.0%)	62 (33.0%)	72 (30.4%)
16.00–17.59	89 (24.7%)	90 (25.8%)	67 (21.5%)	87 (26.5%)	78 (28.6%)	52 (27.7%)	67 (29.0%)
18.00–19.59	82 (26.4%)	70 (21.9%)	63 (24.4%)	97 (32.6%)	70 (30.6%)	59 (29.4%)	74 (31.0%)
20.00–21.59	57 (22.1%)	65 (32.2%)	70 (30.6%)	64 (30.2%)	47 (27.2%)	64 (29.4%)	93 (34.3%)
22.00–23.59	48 (27.0%)	45 (29.0%)	65 (34.6%)	59 (31.7%)	61 (33.2%)	73 (36.0%)	77 (38.5%)

Key 

> Please note that for this table, red boxes denote the times when a patient was least likely to receive systemic steroids within 4 hours of arrival at hospital, while green boxes denote the times when a patient was most likely to receive systemic steroids within 4 hours of arrival at hospital.

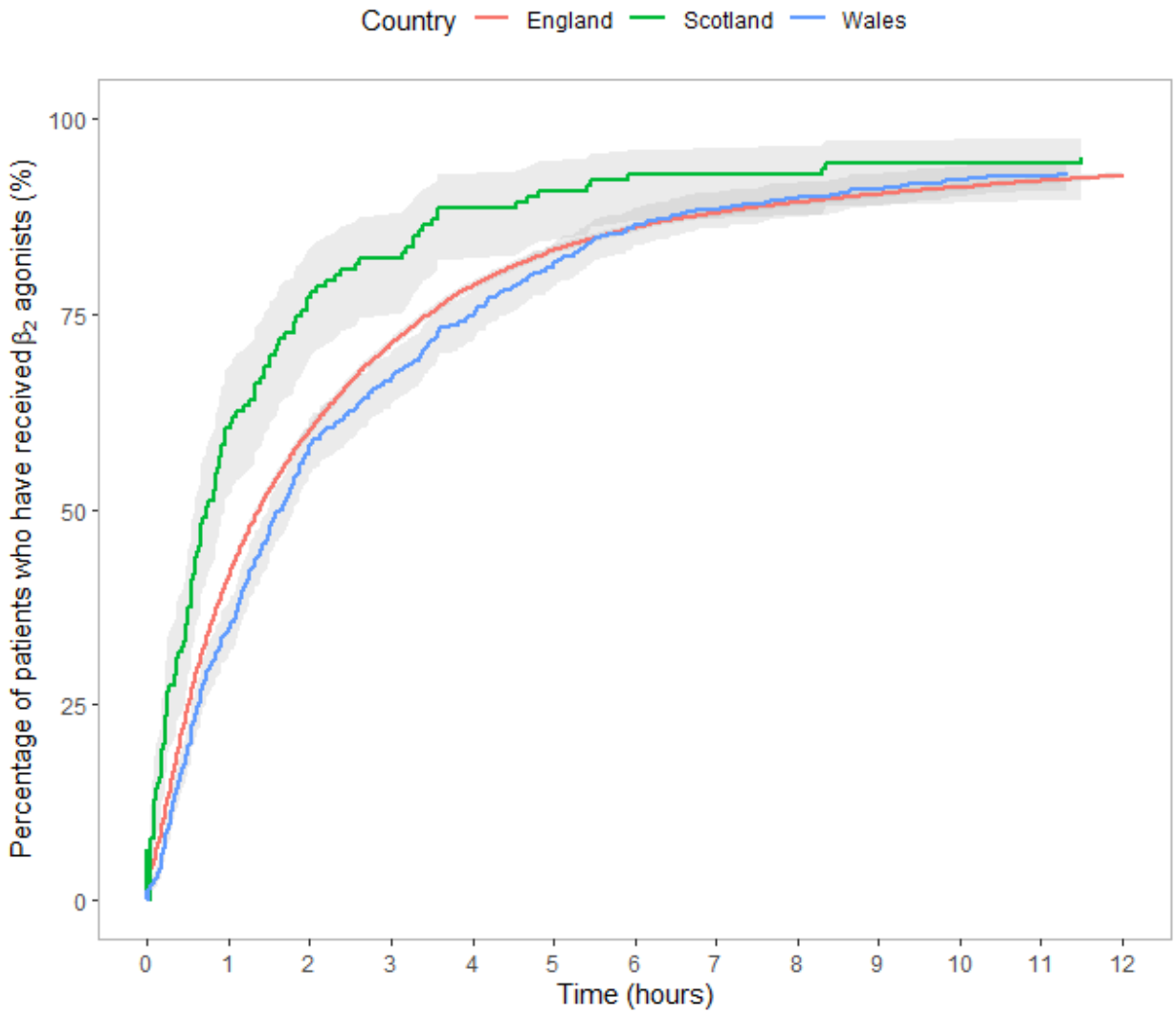
2.5.2a Was the patient administered β_2 agonists following arrival at hospital?

	2019/20				2018/19
β_2 agonists on arrival	**England (N=18,290)**	**Scotland (N=166)**	**Wales (N=904)**	**All (N=19,360)**	**All (N=10,242)**
Yes	16,773 (91.7%)	139 (83.7%)	741 (82.0%)	17,653 (91.2%)	9,346 (91.3%)
Not administered	764 (4.2%)	12 (7.2%)	54 (6.0%)	830 (4.3%)	408 (4.0%)
Not recorded	753 (4.1%)	15 (9.0%)	109 (12.1%)	877 (4.5%)	488 (4.8%)

2.5.2b Median time, in minutes, from arrival at hospital to administration of β_2 agonists

	2019/20				2018/19
Median time, in minutes, from arrival to administration of β_2 agonists	**England (N=16,773)**	**Scotland (N=139)**	**Wales (N=741)**	**All (N=17,653)**	**All (N=9,346)**
Median (IQR)	83 (31 to 208)	44 (15 to 112)	100 (38 to 241)	83 (31 to 209)	82 (31 to 210)

Fig 4. Cumulative percentage of patients who received β_2 agonists following arrival at hospital



2.5.2c Number of patients receiving β_2 agonists within 1 hour of arrival at hospital

	2019/20				2018/19
β_2 agonists within 1 hour	**England (N=16,773)**	**Scotland (N=139)**	**Wales (N=741)**	**All (N=17,653)**	**All (N=9,346)**
Received within 1 hour	6,882 (41.0%)	84 (60.4%)	255 (34.4%)	7,221 (40.9%)	3,941 (42.2%)

2.5.2d Number of patients receiving β_2 agonists within 4 hours of arrival at hospital

	2019/20				2018/19
β_2 agonists within 4 hours	**England (N=16,773)**	**Scotland (N=139)**	**Wales (N=741)**	**All (N=17,653)**	**All (N=9,346)**
Received within 4 hours	13,161 (78.5%)	123 (88.5%)	554 (74.8%)	13,838 (78.4%)	7,306 (78.2%)

Section 3:
Good practice care before discharge

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Navigation

This section contains the following tables and graphs. If you are viewing this report on an electronic device, you can select the table that you wish to see from the list below.

Key standards – elements of good practice care on discharge:

- **BTS/SIGN 2019 [5.2.2]**: A hospital admission represents a window of opportunity to review self-management skills. No patient should leave hospital without a written personalised asthma action plan.[2]
- **BTS/SIGN 2019 [5.3.2]**: Prior to discharge, inpatients should receive written personalised asthma action plans, given by healthcare professionals with expertise in providing asthma education.[2]
- **BTS/SIGN 2019 [9.6.2]**: Prior to discharge, trained staff should give asthma education. This should include education on inhaler technique and PEF record keeping, with a written PEF and symptom-based personalised asthma action plan being provided allowing the patient to adjust their therapy within recommendations. These measures have been shown to reduce morbidity after the asthma attack and reduce relapse rates.[2]
- **BTS/SIGN 2019 [9.6.3]**: A careful history should elicit the reasons for the asthma attack and explore possible actions the patient should take to prevent future emergency presentations.[2]
- **BTS/SIGN 2019 [9.6.3]**: Medication should be altered depending upon the assessment and the patient provided with an asthma action plan aimed at preventing relapse, optimising treatment and preventing delay in seeking assistance in the future.[2]
- **BTS/SIGN 2019 [9.6.3]**: Prior to discharge, follow up should be arranged with the patient's general practitioner or asthma nurse within 2 working days, and with a hospital specialist asthma nurse or respiratory physician at about 1 month after admission.[2]
- **NICE 2018 QS25 [QS4]**: People who receive treatment in an emergency care setting for an asthma attack are followed up by their general practice within 2 working days of discharge.[7]
- **NICE 2018 QS25 [QS5]**: People with suspected severe asthma are referred to a specialist multidisciplinary severe asthma service.[7]

Audit results – elements of good practice care on discharge:

Elements of good practice care

- **87.7%** of all patients received **at least one of the elements** of good practice care. This figure includes the elements listed below, in addition to 'triggers discussed' as an option. The figure excludes current smokers who only had tobacco dependency addressed.
- **37.5%** of patients received **all six elements of good practice care**. The six elements were:
  - inhaler technique checked
  - maintenance medication reviewed
  - adherence discussed
  - personalised asthma action plan issued/reviewed
  - tobacco dependency addressed (if a current smoker)
  - follow up (patient provided either: community follow up requested within 2 working days and/or specialist review requested within 4 weeks).
- The **least frequently provided** elements of good practice care were (values in parentheses represent the proportion of patients in receipt of an asthma care bundle who received this bundle element**):**
  - community follow up requested within 2 working days (**40.5%**)
  - issue/review of a personalised asthma action plan (PAAP) (**47.4%)**.
- The **most frequently provided** elements of good practice care were (values in parentheses represent the proportion of patients in receipt of an asthma care bundle who received this bundle element):
  - maintenance medication reviewed (**78.7%**)
  - tobacco dependency addressed (if current smoker) (**67.7%**) (denominator of current smokers = 4,394)
  - inhaler technique checked (64.8%).

Asthma care bundle[****]

- **57.7%** of patients **received an asthma care bundle.**

Relationship between asthma care bundle and elements of good practice care received

- Those who received an asthma care bundle were over 20 times more likely to receive all six elements of good practice compared with those who did not receive an asthma care bundle (OR = 22.76, 95% CI 20.67 to 25.10).

[****] An asthma care bundle is a short list of things that should be done for every patient that has been admitted to hospital with an asthma attack. It may be paper or electronic depending on the care setting and is there to act as a reminder to busy staff of the things to focus on. An asthma care bundle can be incompletely applied – in which case all six elements may not be delivered and is therefore a prompt to improve care standards. The audit has measured the delivery of the six separate elements of good practice as well as whether or not they were included in an asthma care bundle.

3.1 Day of discharge[††††]

	2019/20				2018/19
Day of discharge	England (N=18,250)	Scotland (N=164)	Wales (N=899)	All (N=19,313)	All (N=10,219)
Monday	2,769 (15.2%)	31 (18.9%)	149 (16.6%)	2,949 (15.3%)	1,632 (16.0%)
Tuesday	3,184 (17.4%)	24 (14.6%)	154 (17.1%)	3,362 (17.4%)	1,628 (15.9%)
Wednesday	2,935 (16.1%)	33 (20.1%)	138 (15.4%)	3,106 (16.1%)	1,561 (15.3%)
Thursday	2,910 (15.9%)	31 (18.9%)	155 (17.2%)	3,096 (16.0%)	1,605 (15.7%)
Friday	3,059 (16.8%)	29 (17.7%)	154 (17.1%)	3,242 (16.8%)	1,744 (17.1%)
Saturday	1,855 (10.2%)	12 (7.3%)	72 (8.0%)	1,939 (10.0%)	1,077 (10.5%)
Sunday	1,538 (8.4%)	4 (2.4%)	77 (8.6%)	1,619 (8.4%)	972 (9.5%)

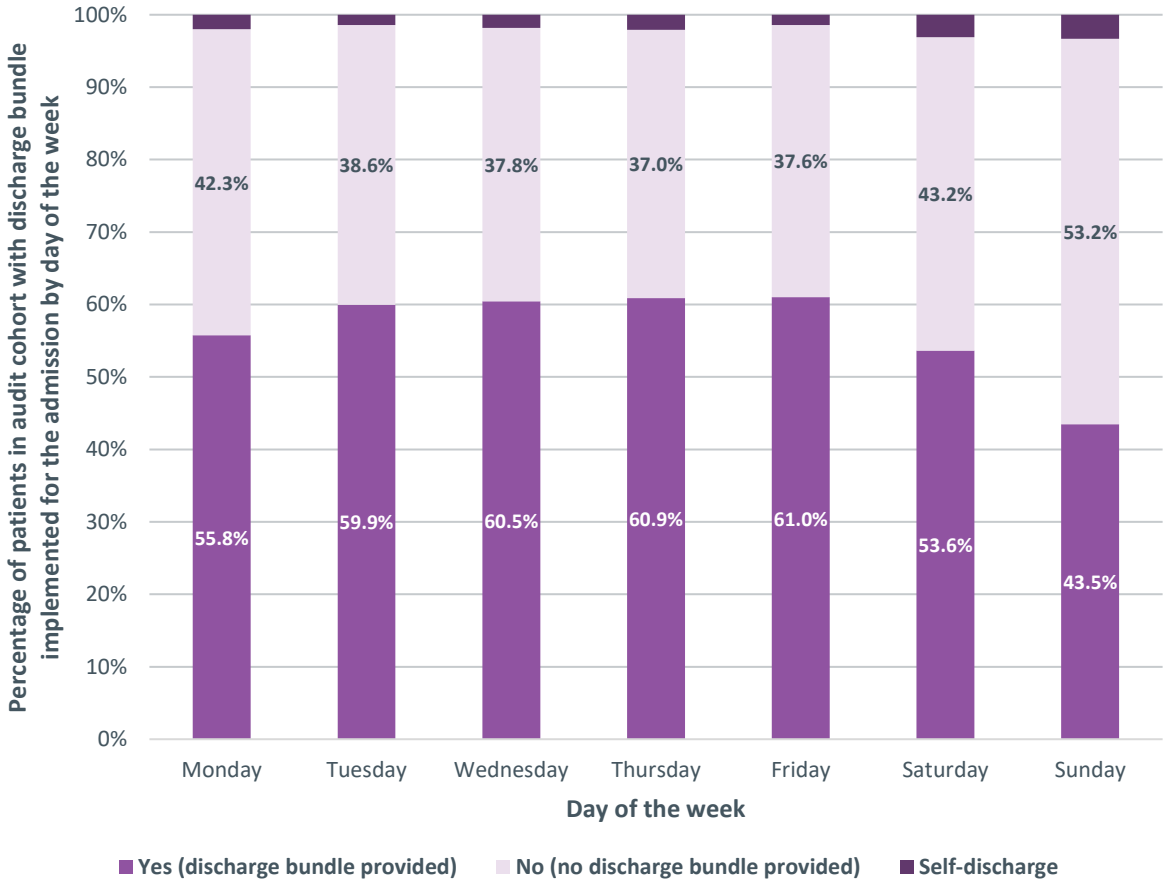
3.2 Discharge bundles

3.2.1 Was a discharge bundle implemented for this admission?[‡‡‡‡, §§§§]

	2019/20				2018/19
	England (N=18,250)	Scotland (N=164)	Wales (N=899)	All (N=19,313)	All (N=10,219)
Discharge bundle given	10,818 (59.3%)	65 (39.6%)	261 (29.0%)	11,144 (57.7%)	4,926 (48.2%)

[††††] The denominator excludes patients who died as inpatients.
[‡‡‡‡] The denominator excludes patients who died as inpatients.
[§§§§] The content of asthma care bundles may vary at local level.

Fig 6. Percentage of patients with a discharge bundle implemented for the admission by day of the week



3.3 Elements of good practice care

3.3.1 What elements of good practice care were undertaken as part of the patient's discharge?[*****,†††††]

	2019/20				2018/19
	England (N=18,250)	Scotland (N=164)	Wales (N=899)	All (N=19,313)	All (N=10,219)
Inhaler technique checked	11,963 (65.6%)	138 (84.1%)	421 (46.8%)	12,522 (64.8%)	5,984 (58.6%)
Maintenance medication reviewed	14,256 (78.1%)	133 (81.1%)	803 (89.3%)	15,192 (78.7%)	7,139 (69.9%)
Adherence discussed	11,173 (61.2%)	117 (71.3%)	388 (43.2%)	11,678 (60.5%)	5,408 (52.9%)
Personalised asthma action plan (PAAP) issued/reviewed	8,786 (48.1%)	110 (67.1%)	261 (29.0%)	9,157 (47.4%)	4,147 (40.6%)
Triggers discussed	10,737 (58.8%)	104 (63.4%)	340 (37.8%)	11,181 (57.9%)	5,001 (48.9%)
Community follow up requested within 2 working days	7,511 (41.2%)	93 (56.7%)	220 (24.5%)	7,824 (40.5%)	3,461 (33.9%)
Specialist review requested within 4 weeks	9,522 (52.2%)	87 (53.0%)	454 (50.5%)	10,063 (52.1%)	5,073 (49.6%)
Tobacco dependency addressed (if current smoker)**	2,780 (67.9%)	30 (78.9%)	162 (63.5%)	2,972 (67.7%)	1,256 (59.2%)
None	2,290 (12.5%)	18 (11.0%)	63 (7.0%)	2,371 (12.3%)	1,709 (16.7%)

**Denominators of current smokers, England (N=4,097), Scotland (N=38), Wales (N=255), All (N=4,390)

3.3.2 Number of patients in receipt of all six elements of good practice[‡‡‡‡‡]

	2019/20				2018/19
	England (N=18,250)	Scotland (N=164)	Wales (N=899)	All (N=19,313)	All (N=10,219)
Six elements given *(five given if non-smoker)*	6,948 (38.1%)	77 (47.0%)	225 (25.0%)	7,250 (37.5%)	3,178 (31.1%)
Six elements not given *(five not given if non-smoker)*	11,302 (61.9%)	87 (53.0%)	674 (75.0%)	12,063 (62.5%)	7,041 (68.9%)

***** This question followed a tick all that apply format and the denominator excludes patients who died as inpatients.
††††† The analysis excludes current smokers who only had tobacco dependency addressed (N=59).
‡‡‡‡‡ The denominator excludes patients who died as inpatients.

3.4 Inhaled steroids and oral steroids

Key standards – inhaled steroids and oral steroids:

> BTS/SIGN 2019 [Management of acute asthma in adults in hospital (Annex 5)]: When discharged from hospital, patients should have treatment with oral steroids (prednisolone 40–50 mg until recovery – minimum 5 days) and inhaled steroids in addition to bronchodilators.[1]

Audit results – inhaled steroids and oral steroids:

> **89.6%** of patients were prescribed **inhaled steroids at discharge**.
> **91.1%** of patients were prescribed at least **5 days of oral steroids for treatment** of their asthma attack.
> **32.5%** of patients had been prescribed **more than two courses of oral steroids in the last 12 months**.

3.4.1 Was the patient in receipt of inhaled steroids at discharge?§§§§§

	2019/20				2018/19
Inhaled steroids at discharge	England (N=18,250)	Scotland (N=164)	Wales (N=899)	All (N=19,313)	All (N=10,219)
Yes	16,431 (90.0%)	160 (97.6%)	712 (79.2%)	17,303 (89.6%)	9,107 (89.1%)
No	1,762 (9.7%)	4 (2.4%)	184 (20.5%)	1,950 (10.1%)	1,063 (10.4%)
Not prescribed for medical reasons	57 (0.3%)	0 (0.0%)	3 (0.3%)	60 (0.3%)	49 (0.5%)

3.4.2 Was the patient prescribed at least 5 days of oral steroids for treatment of their asthma attack? ******

	2019/20				2018/19
Prescribed at least 5 days of oral steroids	England (N=18,250)	Scotland (N=164)	Wales (N=899)	All (N=19,313)	All (N=10,219)
Yes	16,666 (91.3%)	157 (95.7%)	762 (84.8%)	17,585 (91.1%)	9,220 (90.2%)

3.4.3 Has the patient been prescribed more than two courses of oral steroids in the past 12 months?††††††

	2019/20				2018/19
Prescribed more than two courses of oral steroids	England (N=18,250)	Scotland (N=164)	Wales (N=899)	All (N=19,313)	All (N=10,219)
Yes	6,073 (33.3%)	38 (23.2%)	172 (19.1%)	6,283 (32.5%)	3,054 (29.9%)
No	7,782 (42.6%)	106 (64.6%)	346 (38.5%)	8,234 (42.6%)	4,148 (40.6%)
Not recorded	4,395 (24.1%)	20 (12.2%)	381 (42.4%)	4,796 (24.8%)	3,017 (29.5%)

3.5 Referral for hospital assessment

§§§§§ The denominator excludes patients who died as inpatients.
****** The denominator excludes patients who died as inpatients.
†††††† The denominator excludes patients who died as inpatients.

Key standards – referral for hospital assessment

> BTS/SIGN 2019 [9.6]: When discharged from hospital, patients should have a follow-up appointment in a respiratory clinic within 4 weeks.[1]

> NRAD 2014 [Organisation of NHS services – recommendation 3]: Secondary care follow up should be arranged after every hospital admission for asthma […].[3]

Audit results – referral for hospital assessment:

> **55.1%** of patients were **referred for hospital assessment / follow up.** A further **15.4%** of patients were **already being seen** in a secondary care clinic.

3.5.1 Was the patient referred for hospital assessment / follow up for asthma?‡‡‡‡‡‡

	2019/20				2018/19
Referral for hospital assessment / follow up	England (N=18,250)	Scotland (N=164)	Wales (N=899)	All (N=19,313)	**All (N=10,219)**
Yes	10,043 (55.0%)	90 (54.9%)	499 (55.5%)	10,632 (55.1%)	5,702 (55.8%)
No	4,304 (23.6%)	16 (9.8%)	202 (22.5%)	4,522 (23.4%)	2,604 (25.5%)
Not recorded	800 (4.4%)	23 (14.0%)	99 (11.0%)	922 (4.8%)	527 (5.2%)
Patient declined	256 (1.4%)	0 (0.0%)	10 (1.1%)	266 (1.4%)	138 (1.4%)
Already being seen in secondary care clinic	2,847 (15.6%)	35 (21.3%)	89 (9.9%)	2,971 (15.4%)	1,248 (12.2%)

Key standards – oral steroids history and referral for hospital assessment:§§§§§§

> NRAD 2014 [Organisation of NHS services – recommendation 2]: Patients with asthma must be referred to a specialist asthma service if they have required more than two courses of systemic corticosteroids, oral or injected, in the previous 12 months or require management using British Thoracic Society (BTS) stepwise treatment 4 or 5 to achieve control.[3]

Audit results – oral steroids history and referral for hospital assessment:

> Where patients were **prescribed more than two courses of oral steroids in the previous 12 months**, **55.7%** were referred for hospital assessment / follow up and 30.9% of patients were recorded as already being seen in secondary care clinic.

> **10.6%** of patients **prescribed more than two courses of oral steroids in the past 12 months** were **not referred for hospital assessment / follow up.**

‡‡‡‡‡‡ The denominator excludes patients who died as inpatients.

§§§§§§ Patients with asthma must be referred to a specialist asthma service if they have required more than two courses of systemic corticosteroids (oral or injected) in the previous 12 months or require management using British Thoracic Society (BTS) stepwise treatment 4 or 5 to achieve control.
This is a key recommendation from the Royal College of Physicians. *Why asthma still kills: The National Review of Asthma Deaths (NRAD) Confidential Enquiry report*. London: RCP, 2014. **www.rcplondon.ac.uk/projects/outputs/why-asthma-still-kills**.[4]

3.5.2 Number of patients prescribed more than two courses of oral steroids in the past 12 months, who were also referred for hospital assessment / follow up for asthma[*******]

	2019/20				2018/19
Prescribed more than two courses of oral steroid and referred for hospital assessment / follow up	**England (N=6,073)**	**Scotland (N=38)**	**Wales (N=172)**	**All (N=6,283)**	**All (N=3,054)**
Yes	3,371 (55.5%)	21 (55.3%)	110 (64.0%)	3,502 (55.7%)	1,773 (58.1%)
No	652 (10.7%)	0 (0.0%)	13 (7.6%)	665 (10.6%)	386 (12.6%)
Not recorded	95 (1.6%)	3 (7.9%)	9 (5.2%)	107 (1.7%)	86 (2.8%)
Patient declined	66 (1.1%)	0 (0.0%)	2 (1.2%)	68 (1.1%)	35 (1.1%)
Already being seen in secondary care clinic	1,889 (31.1%)	14 (36.8%)	38 (22.1%)	1,941 (30.9%)	774 (25.3%)

3.6 Tobacco dependency

Key standards:

- BTS/SIGN 2019 [6.2.3]: People with asthma and parents/carers of children with asthma should be advised about the dangers of smoking and second-hand tobacco smoke exposure and should be offered appropriate support to stop smoking.[1]
- NICE 2013 QS43 [QS1]: People should be asked if they smoke by their healthcare practitioner, and those who smoke should be offered advice on how to stop.[2]
- NRAD 2014 [Patient factors and perception of risk – recommendation 2]: A history of smoking and/or exposure to second-hand smoke should be documented in the medical records of all people with asthma. Current smokers should be offered referral to a smoking cessation service.[3]

Audit results – tobacco dependency:

- **22.7%** of patients admitted for asthma attacks were **recorded as current smokers.**
- **23.6%** of patients admitted were ex-smokers and **44.5%** of patients had never smoked.
- **67.7%** of current smokers had their tobacco dependency addressed prior to discharge.[†††††††]

[*******] The denominator excludes patients who died as inpatients.

[†††††††] Addressing tobacco dependency includes identifying patients who smoke on admission and offering and/or prescribing smoking cessation advice and/or pharmacotherapy

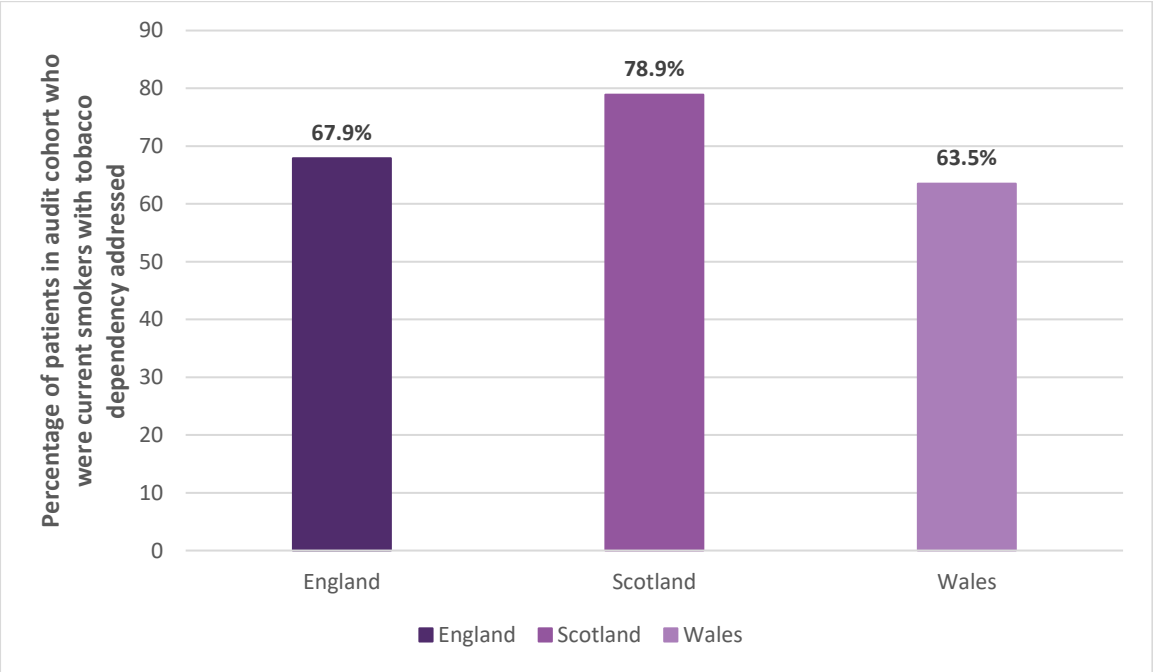
3.6.1 Smoking status

	2019/20				2018/19
Smoking status	England (N=18,290)	Scotland (N=166)	Wales (N=904)	All (N=19,360)	All (N=10,242)
Never smoked	8,180 (44.7%)	76 (45.8%)	357 (39.5%)	8,613 (44.5%)	4,801 (46.9%)
Ex-smoker	4,315 (23.6%)	50 (30.1%)	213 (23.6%)	4,578 (23.6%)	2,340 (22.8%)
Current smoker	4,099 (22.4%)	38 (22.9%)	257 (28.4%)	4,394 (22.7%)	2,122 (20.7%)
Ex-smoker and current vaper	124 (0.7%)	1 (0.6%)	6 (0.7%)	131 (0.7%)	71 (0.7%)
Never smoked and current vaper	26 (0.1%)	0 (0.0%)	1 (0.1%)	27 (0.1%)	24 (0.2%)
Not recorded	1,546 (8.5%)	1 (0.6%)	70 (7.7%)	1,617 (8.4%)	884 (8.6%)

3.6.2 Current smokers with tobacco dependency addressed ‡‡‡‡‡‡‡, §§§§§§§

	2019/20				2018/19
	England (N=4,097)	Scotland (N=38)	Wales (N=255)	All (N=4,390)	All (N=2,121)
Tobacco dependency addressed	2,780 (67.9%)	30 (78.9%)	162 (63.5%)	2,972 (67.7%)	1,256 (59.2%)

Fig 7. Percentage of patients in audit cohort who were current smokers with tobacco dependency addressed



‡‡‡‡‡‡‡ Addressing tobacco dependency includes identifying patients who smoke on admission and offering and/or prescribing smoking cessation advice and/or pharmacotherapy.
§§§§§§§ The denominator for this metric is based on the number of current smokers identified in Table 3.6.1. Please note that the definition of current smoker for the purposes of the audit includes smokers of cannabis and heroin.

Section 4:

Proposed best practice tariff metrics

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The asthma best practice tariff (BPT) is a proposed England-only financial incentive to support trusts in resourcing teams to provide specified, high-value, elements of asthma care during hospital admission, in a manner similar to that achieved by the COPD BPT. The audit has measured performance against the metrics proposed.

A BPT is made up of two components:

- a base tariff – paid irrespective of whether the mandatory BPT metrics are met
- a conditional top up – payable if the mandatory metrics are met.

Achievement is measured at trust, not patient, level, and in the case of the proposed asthma BPT a trust would need to ensure that at least 50% of cases included in the audit receive all mandatory metrics during their admission, to achieve the conditional top up payment. If this has been achieved, the conditional top up payment would be paid for every adult asthma admission. Likewise, if a provider has not met the requisite 50%, the conditional top up will not be received for any patient episode.

Financial incentives for promoting good patient care are being reviewed nationally. However, the metrics described below were selected after discussion between the NACAP team, Getting It Right First Time (GIRFT) and the BTS as aspects of care, which if implemented reliably, could improve outcomes for patients. We have therefore provided details of the metrics below to allow clinical teams to assess how they perform against the suggested standards.

The mandatory BPT metrics are proposed to be:

a) provision of respiratory review within 24 hours of arrival and

b) provision of the following elements of good practice asthma care before discharge:

- inhaler technique checked
- maintenance medication reviewed
- personal asthma action plan (PAAP) issued/reviewed
- tobacco dependency addressed (if current smoker).

We are aware that the BPTs have been suspended as a result of COVID-19 and all trusts moved on to block contracts. This information has therefore been given to provide hospitals with information on its content ahead of this system being reinstated. Scottish hospitals and Welsh health boards would not receive BPT payments. Data for Scotland and Wales against these proposed BPT metrics are also included in the data analysis and methodology report so that these hospitals can see how they performed against the proposed England BPT metrics.

Navigation

This section contains the following tables and graphs. If you are viewing this report on an electronic device, you can select the table that you wish to see from the list below.

Audit results – best practice tariff:

- **28.8%** of patients received all mandatory BPT elements.
- **52.4%** of patients received a **specialist respiratory review within 24 hours.**
- **64.8%** of patients had their **inhaler technique checked.**
- **78.7%** of patients had their **maintenance medication reviewed.**
- **47.4%** of patients had a **personalised asthma action plan (PAAP) issued/reviewed.**
- **67.7%** of patients had their **tobacco dependency addressed** (if current smoker).
- **18.5%** of hospitals **met all of the requirements to achieve the BPT.**

4.1 Were mandatory BPT elements provided during admission? ********

	2019/20				2018/19
	England (N=18,250)	Scotland (N=164)	Wales (N=899)	All (N=19,313)	All (N=10,219)
Mandatory BPT elements					
Specialist respiratory review within 24 hours	9,687 (53.1%)	105 (64.0%)	330 (36.7%)	10,122 (52.4%)	4,862 (47.6%)
Inhaler technique checked	11,963 (65.6%)	138 (84.1%)	421 (46.8%)	12,522 (64.8%)	5,984 (58.6%)
Maintenance medication reviewed	14,256 (78.1%)	133 (81.1%)	803 (89.3%)	15,192 (78.7%)	7,139 (69.9%)
Personalised asthma action plan (PAAP) issued/reviewed	8,786 (48.1%)	110 (67.1%)	261 (29.0%)	9,157 (47.4%)	4,147 (40.6%)
Tobacco dependency addressed (if current smoker)*	2,780 (67.9%)	30 (78.9%)	162 (63.5%)	2,972 (67.7%)	1,256 (59.2%)

**Denominators of current smokers, England (N=4,097), Scotland (N=38), Wales (N=255), All (N=4,390)*

4.2 Were all mandatory BPT elements provided during admission?

	2019/20			
	England (N=18,250)	Scotland (N=164)	Wales (N=899)	All (N=19,313)
Patients receiving all BPT elements				
All mandatory elements*	5,350 (29.3%)	76 (46.3%)	137 (15.2%)	5,563 (28.8%)

*Mandatory elements:

- provision of respiratory review within 24 hours of arrival and
- provision of specific elements of good practice asthma care by discharge:
  - inhaler technique checked
  - maintenance medication reviewed
  - personal asthma action plan (PAAP) issued/reviewed
  - tobacco dependency addressed (if current smoker).

******** The denominator excludes patients who died as inpatients.

4.3 Was BPT achieved?

	2019/20			
	England (N=155)	Scotland (N=5)	Wales (N=13)	All (N=173)
Hospital level achievement of BPT standard				
Achieved BPT**	28 (18.1%)	3 (60.0%)	1 (7.7%)	32 (18.5%)

** To qualify for best practice tariff, each trust should achieve a minimum pass rate of 50% of mandatory elements per quarter.

The proposed adult asthma best practice tariff (BPT)

These metrics are:

- provision of respiratory review within 24 hours of arrival and
- provision of specific elements of good practice asthma care by discharge:
  - inhaler technique checked
  - maintenance medication reviewed
  - personal asthma action plan issued/reviewed
  - tobacco dependency addressed (if current smoker).

Audit results – best practice tariff

28.8% of patients received all mandatory BPT elements

52.4% of patients received a specialist respiratory review within 24 hours
64.8% of patients had their inhaler technique checked
78.7% of patients had their maintenance medication reviewed
47.4% of patients had a personalised asthma action plan issued/reviewed
67.7% of patients had their tobacco dependency addressed (if current smoker)

18.5%

of hospitals met all of the requirements to achieve the BPT

Section 5:

The first hour of care

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This section contains information collected in the adult asthma audit that describes the provision of care in the first hour after patients arrive in hospital for treatment of an asthma attack. This section is included to emphasise the importance of patients with asthma attacks being identified and treated as soon as possible in their admission.

In the first hour of care for adult patients admitted to hospital with an acute asthma exacerbation, the aim is to achieve:

- peak expiratory flow (PEF) measurement to assess asthma attack severity
- administration of bronchodilators (β_2 agonists)
- administration of systemic corticosteroids
- assessment of oxygenation and prescription of an oxygen target saturation range of 94–98%.

Once a patient is admitted to hospital, clinicians must rapidly assess the severity of the asthma attack. One element of this assessment is measurement of PEF. At the same time, the clinician must aim to stabilise the patient while relieving distressing symptoms. This is achieved through timely administration of systemic steroids, β_2 agonists and oxygen titrated to the patient's saturations. A Cochrane Review[9] has shown that use of corticosteroids within 1 hour of presentation to an ED significantly reduces the need for hospital admission in patients with acute asthma. Benefits appear to be greatest in patients with more severe asthma, and those not currently receiving steroids. The first hour of care after hospital admission is therefore critical in achieving the best outcome for patients.

Navigation

This section contains the following tables and graphs. If you are viewing this report on an electronic device, you can select the table that you wish to see from the list below.

Audit results – first hour of care:

- **19.0%** of patients had their **PEF taken within 1 hour of arrival at hospital**.
- **37.3%** of patients were **given β_2 agonists within 1 hour**.
- **26.7%** of patients were **given systemic steroids within 1 hour**.

This information is repeated from section 2 of this report for ease of reference.

Audit results – oxygen prescription and administration

- **18.1%** of patients were **prescribed but not administered oxygen.**
- **16.5%** of patients were **administered oxygen with no prescription.**
- **22.5%** of patients were **both prescribed and administered oxygen.**
- **42.9%** of patients were **not prescribed or administered oxygen.**

This information is repeated from section 2 of this report for ease of reference.

5.1 Care in the first hour after arrival in hospital

5.1.1 Standards of care for acute asthma in the first hour

	2019/20				2018/19
	England (N=18,290)	Scotland (N=166)	Wales (N=904)	All (N=19,360)	All (N=10,242)
Standards of care for acute asthma in the first hour					
PEF taken within 1 hour*	3,416 (18.7%)	38 (22.9%)	220 (24.3%)	3,674 (19.0%)	1,797 (17.5%)
β_2 agonists within 1 hour	6,882 (37.6%)	84 (50.6%)	255 (28.2%)	7,221 (37.3%)	3,941 (38.5%)
Systemic steroids within 1 hour	4,976 (27.2%)	43 (25.9%)	156 (17.3%)	5,175 (26.7%)	2,808 (27.4%)

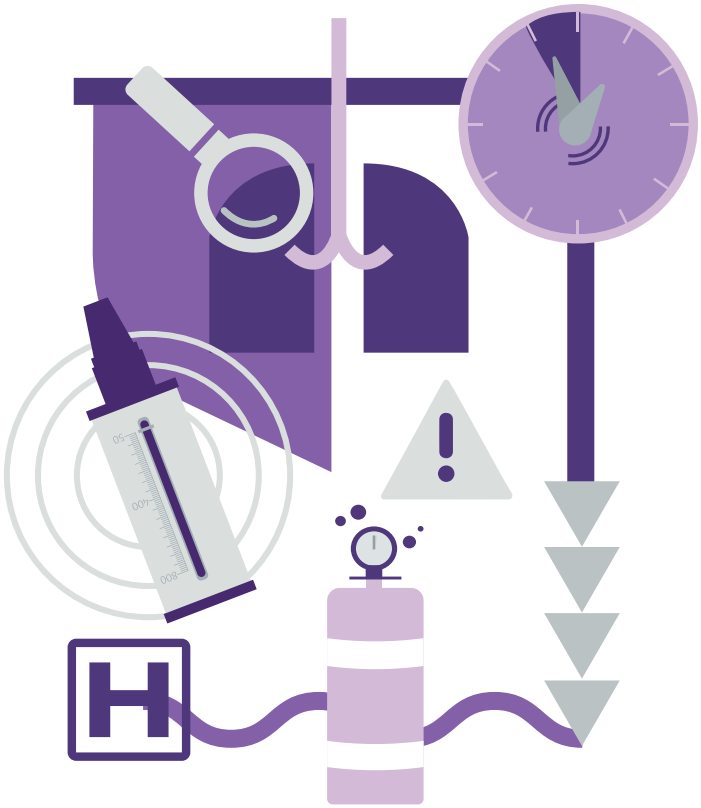
*Patients that were too ill to have a PEF measurement taken have been included in the denominator

5.2 Oxygen prescription

5.2.1 Was oxygen prescribed for / administered to the patient at any point during admission?

	2019/20				2018/19
Oxygen prescription and administration*	England (N=18,290)	Scotland (N=166)	Wales (N=904)	All (N=19,360)	All (N=10,242)
Prescribed only	3,346 (18.3%)	19 (11.4%)	139 (15.4%)	3,504 (18.1%)	1,752 (17.1%)
Administered only	3,036 (16.6%)	39 (23.5%)	121 (13.4%)	3,196 (16.5%)	1,720 (16.8%)
Prescribed and administered	4,031 (22.0%)	55 (33.1%)	261 (28.9%)	4,347 (22.5%)	2,325 (22.7%)
No	7,877 (43.1%)	53 (31.9%)	383 (42.4%)	8,313 (42.9%)	4,445 (43.4%)

*Time sensitive data in relation to oxygen prescription will be included in the next adult asthma report following the audit's dataset refresh.



The first hour of care

For adult patients admitted to hospital with an acute asthma exacerbation, the aim is to achieve:

- assessment of asthma attack severity within 1 hour (peak expiratory flow (PEF) taken)
- administration of bronchodilators (β2 agonists) within 1 hour
- administration of systemic corticosteroids within 1 hour
- assessment of oxygenation and prescription of an oxygen target saturation range of 94–98 % within 1 hour.

Audit results – The first hour of care

19.0%
of patients had their peak flow taken within 1 hour of arrival at hospital

37.3%
of patients were given β2 agonists within 1 hour

26.7%
of patients were given systemic steroids within 1 hour

Audit results – Oxygen prescription and administration

18.1%
of patients were only prescribed oxygen

16.5%
of patients were administered oxygen with no prescription

22.5%
of patients were both prescribed and administered oxygen

42.9%
of patients were not prescribed or administered oxygen

Section 6:

Summary information on patients who died after arrival at hospital

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Despite advances in therapeutics and pathways of care, patients with asthma still die. The RCP's 2014 report *Why asthma still kills* highlighted opportunities by which death might have been avoided with improvements in the standards of care which patients received.[4] To ensure that the focus remains on avoiding death from asthma this section has been added to the audit report to allow audit participants to better understand the demographics and care received by patients who died during the data collection period of the audit to permit a clear focus on quality improvement priorities.

Navigation

This section contains the following tables and graphs. If you are viewing this report on an electronic device, you can select the table that you wish to see from the list below.

Audit data are based on a sample of all patients who were eligible for inclusion in the analysis. Therefore, these data do not provide a representative picture of the full number of asthma deaths that occurred during the audit data collection period.

Audit results – patients who died after being admitted to hospital

- The number of patients that died during admission was **47 (0.2%).**
- The median age of patients that died in hospital was **82** (13 (27.7%) <70 years and 34 (72.3%) ≥70 years).
- Of the patients that died during admission, **13 (27.7%)** were male and **34 (72.3%)** were female.
- **6 (0.1%)** of the patients who died had a **moderate severity asthma exacerbation** and **41 (0.3%)** had **severe and life-threatening asthma attack**.
- The **median time from arrival to inpatient death** was **138 hours** (IQR (78–310)).

Respiratory specialist review

- The **median time to specialist review** for patients who died was **20.9 hours** for those who were seen by a specialist.
- There was a non-statistically significant trend towards a reduced risk of dying for patients who received a specialist review vs those who did not (OR = 0.55 (95% CI 0.30 to 1.06)).
- There is no evidence to support a difference in the likelihood of dying as an inpatient if patients received a respiratory specialist review over 24 hours from arrival at hospital when compared with patients who received a respiratory specialist review within 24 hours of arrival (OR = 1.18, 95% CI 0.57 to 2.36). Please note that as there were a small number of deaths (N=47) the confidence intervals for the odds ratio are wide, and the analysis has not been adjusted for variables such as age or asthma severity.

6.1 Inpatient mortality

6.1.1 Number of people that died as an inpatient

	2019/20	2018/19
Patients discharged	**All (N=19,360)**	**All (N=10,242)**
Inpatient deaths	47 (0.2%)	23 (0.2%)

- Please note that these audit data are based on a sample of all patients who were eligible for inclusion in this round of analysis. Therefore, these data (Table 6.1.1) do not provide a representative picture of the full number of asthma deaths that occurred during the audit data collection period.

6.2 Age

6.2.1 Median age and associations with inpatient mortality

	2019/20	
Age at arrival	**Patient died as inpatient (N=47)**	**Discharged alive (N=19,313)**
Median (IQR)	82 (69 to 88)	48 (33 to 63)

	2019/20	
Age at arrival	**Patient died as inpatient (N=47)**	**Discharged alive (N=19,313)**
<70	13 (27.7%)	15,808 (81.9%)
≥70	34 (72.3%)	3,505 (18.1%)

6.3 Gender

6.3.1 Gender and associations with inpatient mortality

	2019/20	
Gender	**Patient died as inpatient (N=47)**	**Alive at discharge (N=19,279)**
Male	13 (27.7%)	5,434 (28.2%)
Female	34 (72.3%)	13,840 (71.8%)
Transgender	0 (0.0%)	5 (<0.1%)
Other	0 (0.0%)	0 (0.0%)
Not recorded / preferred not to say	0 (0.0%)	0 (0.0%)

6.4 Oxygen prescriptions

6.4.1 Prescribed oxygen and associations with inpatient mortality

	2019/20	
	Died as inpatient (N=47)	**Alive at discharge (N=19,313)**
Oxygen prescribed only	2 (4.3%)	3,502 (18.1%)
Oxygen administered only	18 (38.3%)	3,178 (16.5%)
Oxygen prescribed and administered	21 (44.7%)	4,326 (22.4%)
No	6 (12.8%)	8,307 (43.0%)

6.5 Time to inpatient death

6.5.1 Median time from arrival to inpatient death

	2019/20
	Died as inpatient (N=47)
Median time from arrival to inpatient death, hours (IQR)	138 (78 to 310)

6.6 Asthma attack severity

6.6.1 Severity of asthma attack and associations with inpatient mortality

	2019/20	
	Moderate acute asthma (N=6,798)	Severe and life-threatening acute asthma (N=12,562)
Died as inpatient	6 (0.1%)	41 (0.3%)

	Died as an inpatient (N=33)	Alive at discharge (N=15,677)
Average time from arrival to respiratory specialist review, hours (IQR)	21 (8 to 53)	19 (11 to 32)

6.7 Systemic steroids

6.7.1 Time to systemic steroids and associations with inpatient mortality

	2019/20	
	Time from arrival to systemic steroids <1 hour (N=5,175)	Time from arrival to systemic steroids ≥1 hour (N=11,747)
Died as inpatient	13 (0.3%)	25 (0.2%)

There is no evidence to support a difference in the likelihood of dying as an inpatient if patients were administered systemic steroids over 1 hour of arrival when compared with patients who received systemic steroids within 1 hour of arrival (OR = 0.85, 95% CI 0.44 to 1.71). This may be due to this analysis being underpowered as the number of deaths was small (N=47). The analysis has also not been adjusted for variables such as age or socioeconomic status.

6.8 β_2 agonists

6.8.1 Time to β_2 agonists and associations with inpatient mortality

	2019/20	
	Time from arrival to β_2 agonists <1 hour (N=7,221)	Time from arrival to β_2 agonists ≥1 hour (N=10,432)
Died as inpatient	15 (0.2%)	23 (0.2%)

There is no evidence to support a difference in the likelihood of dying as an inpatient if patients were administered β_2 agonists over 1 hour from arrival at hospital when compared with patients who were administered β_2 agonists within 1 hour of arrival (OR = 1.06, 95% CI 0.56 to 2.08). This may be due to this analysis being underpowered as the number of deaths was small (N=47). The analysis has also not been adjusted for variables such as age or socioeconomic status.

6.9 Respiratory specialist review

6.9.1 Respiratory specialist review and associations with inpatient mortality

	2019/20	
Life status	**No respiratory specialist review received (N=3,650)**	**Respiratory specialist review received (N=15,710)**
Alive	3,636 (99.6%)	15,677 (99.8%)
Died as inpatient	14 (0.4%)	33 (0.2%)

Patients who received a specialist review were half as likely to die as an inpatient, compared with patients who did not receive a specialist review (OR = 0.55, 95% CI 0.30 to 1.06), although the 95% confidence intervals crossed 1, so it is possible that there is no true difference between the groups. This relationship may be because those who were more ill on arrival did not have the opportunity to see a respiratory specialist. Please note that as there was a small number of deaths (N=47) the confidence intervals for the odds ratio are wide, and the analysis has not been adjusted for variables such as age or asthma severity.

6.9.2 Respiratory specialist review within 24 hours and associations with inpatient mortality

	Respiratory specialist review received <24 hours (N=10,142)	Respiratory specialist review received ≥24 hours (N=5,568)
Alive	10,122 (99.8%)	5,555 (99.8%)
Died as inpatient	20 (0.2%)	13 (0.2%)

There is no evidence to support a difference in the likelihood of dying as an inpatient if patients received a respiratory specialist review over 24 hours from arrival at hospital when compared with patients who received a respiratory specialist review within 24 hour of arrival (OR = 1.18, 95% CI 0.57 to 2.36). Please note that as there were a small number of deaths (N=47) the confidence intervals for the odds ratio are wide, and the analysis has not been adjusted for variables such as age or asthma severity.

Section 7:

Sub-analyses

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This section contains sub-analyses of the 2019/20 data included in the previous sections, and presents associations between various metrics and:

- length of stay
- inpatient mortality
- review by a member of the respiratory specialist team.

Navigation

This section contains the following tables and graphs. If you are viewing this report on an electronic device, you can select the table that you wish to see from the list below.

7.1 Asthma attack severity

Asthma attack severity was classified according to the NICE[††††††††] and BTS guideline[‡‡‡‡‡‡‡‡] thresholds. Please note that the audit dataset is limited to collection of a smaller subset of physiological variables compared with the full list provided in the NICE/BTS guidelines and therefore asthma attack severity categorisation provided here is indicative only. The physiological variables used to categorise asthma attack severity of patients included in the audit were heart rate, respiratory rate, oxygen saturation (where measured) and PEF (where measured). In addition, patients with a heart rate of less than 30 beats per minute or a respiratory rate of less than 10 breaths per minute were classified as severe. Patients recorded as '*Patient too unwell*' for PEF measurement, whose other physiological measurements were normal, were classified as severe.

[††††††††] NICE guidance on classification of asthma severity is available at: https://bnf.nice.org.uk/treatment-summary/asthma-acute.html

[‡‡‡‡‡‡‡‡] BTS guidance on classification of asthma severity is available at: www.brit-thoracic.org.uk/quality-improvement/guidelines/asthma/

7.1.1 Categorisation of severity of acute asthma patient admissions

	2019/20			
	England (N=18,290)	Scotland (N=166)	Wales (N=904)	All (N=19,360)
Moderate acute asthma	6,386 (34.9%)	64 (38.6%)	348 (38.5%)	6,798 (35.1%)
Severe and life-threatening acute asthma	11,904 (65.1%)	102 (61.4%)	556 (61.5%)	12,562 (64.9%)

7.1.2 Severity of asthma attack and associations with receipt of respiratory specialist review

	2019/20	
Patient reviewed by a respiratory specialist	**Moderate acute asthma (N=6,798)**	**Severe and life-threatening acute asthma (N=12,562)**
Yes	5,034 (74.1%)	10,676 (85.0%)
No	1,764 (25.9%)	1,886 (15.0%)

Those with asthma classed as severe or life-threatening on arrival (according to heart rate, respiratory rate, oxygen saturation, and peak flow) were twice as likely to receive a respiratory specialist review as those with asthma classed as moderate (OR = 1.98, 95% CI 1.84 to 2.13), but 15% of patients with severe or life-threatening asthma did not see a specialist at any point during their admission.

7.1.3 Severity of asthma attack and associations with time to respiratory specialist review

	2019/20
	Median time until specialist review, hours (IQR) (N=19,360)
Moderate acute asthma	19.2 (10.9 to 29.3)
Severe and life-threatening acute asthma	19.4 (10.8 to 33.7)

7.2 Systemic steroids

7.2.1 Time to systemic steroids and associations with length of stay

	2019/20	
	Time from arrival to systemic steroids <1 hour (N=5,162)	**Time from arrival to systemic steroids ≥1 hour (N=11,722)**
Length of stay ≤3 days	2,907 (56.3%)	6,627 (56.5%)
Length of stay >3 days	2,255 (43.7%)	5,095 (43.5%)

There did not appear to be an association between receiving systemic steroids within 1 hour of admission to hospital and length of stay (OR = 0.99, 95% CI 0.93 to 1.06). However, it is worth noting that this analysis has not been adjusted for confounders such as age, asthma severity or comorbidities, which could affect both time to receipt of systemic steroids and length of stay.

7.3 β_2 agonists

7.3.1 Time to β_2 agonists and associations with length of stay

	2019/20	
	Time from arrival to β_2 agonists <1 hour (N=7,206)	**Time from arrival to β_2 agonists ≥1 hour (N=10,409)**
Length of stay ≤3 days	4,089 (56.7%)	5,895 (56.6%)
Length of stay >3 days	3,117 (43.3%)	4,514 (43.4%)

There did not appear to be an association between receiving β_2 agonists within 1 hour of admission to hospital and length of stay (OR = 1.00, 95% CI 0.95 to 1.07). However, it is worth noting that this analysis has not been adjusted for confounders such as age, asthma severity, or comorbidities, which could affect both time to receipt of β_2 agonists and length of stay.

7.4 Respiratory specialist review

7.4.1 Respiratory specialist review and associations with length of stay

	2019/20	
	Respiratory specialist review (N=15,677)	**No respiratory specialist review (N=3,636)**
Length of stay ≤3 days	8,104 (51.7%)	3,115 (85.7%)
Length of stay >3 days	7,573 (48.3%)	521 (14.3%)

Those who received a respiratory specialist review were more likely to have a length of stay longer than 3 days (OR = 5.59, 95% CI 5.07 to 6.17). A possible explanation for this finding may be that patients who were less acutely unwell were discharged quicker and therefore less likely to be seen by a specialist. Another reason may be that it takes time to organise review by a specialist and this in itself leads to a longer hospital stay. Finally, other areas of the dataset show that specialist input is associated with receipt of more of the elements of high-quality asthma care, which may take more time to organise. Balancing quality of care and length of stay requires prioritisation.

7.4.2 Respiratory specialist review and associations with addressing tobacco dependency in current smokers[§§§§§§§§]

	2019/20	
	Respiratory specialist review (N=3,641)	**No respiratory specialist review (N=749)**
Tobacco dependency addressed, among those who are smokers	2,758 (75.7%)	214 (28.6%)

Current smokers who received a respiratory specialist review were nearly eight times more likely to have their tobacco dependency addressed (OR = 7.81, 95% CI 6.56 to 9.32).

7.4.3 Respiratory specialist review and associations with receiving a discharge bundle

	2019/20	
	Respiratory specialist review (N=15,677)	**No respiratory specialist review (N=3,636)**
Received a discharge bundle	10,843 (69.2%)	301 (8.3%)

Patients who received a specialist review were nearly 25 times more likely to receive a discharge bundle than those who did not receive a review (OR = 24.85, 95% CI 22.02 to 28.15).

§§§§§§§§ Denominator includes current smokers only and does not include patients who died as inpatients

7.4.4 Respiratory specialist review and associations with receiving elements of good practice care on discharge*********

	Respiratory specialist review (N=15,677)	No respiratory specialist review (N=3,636)	OR (95% CI)
Inhaler technique checked	12,043 (76.8%)	479 (13.2%)	21.84 (19.72 to 24.24)
Maintenance medication reviewed	13,555 (86.5%)	1,637 (45.0%)	7.80 (7.20 to 8.45)
Adherence discussed	11,237 (71.7%)	441 (12.1%)	18.34 (16.52 to 20.40)
Personalised asthma action plan issued/reviewed	8,962 (57.2%)	195 (5.4%)	23.55 (20.38 to 27.38)
Triggers discussed	10,771 (68.7%)	410 (11.3%)	17.27 (15.52 to 19.27)
Community follow up requested within 2 working days	7,410 (47.3%)	414 (11.4%)	6.98 (6.28 to 7.77)
Specialist review requested within 4 weeks	9,516 (60.7%)	547 (15.0%)	8.72 (7.93 to 9.61)
None	853 (5.4%)	1,518 (41.7%)	0.08 (0.07 to 0.09)

Receipt of a respiratory specialist review was strongly associated with receipt of each discharge bundle element. Patients who received a respiratory specialist review were between 7 and 24 times as likely to receive individual elements of the discharge bundle compared with patients who did not receive a respiratory specialist review. Conversely, those who did not receive a respiratory specialist review were 12.5 times more likely to fail to receive any element of the discharge bundle compared to those who did receive a respiratory specialist review (OR = 0.08, 95% CI 0.07 to 0.09).

7.4.5 Discharge bundle and associations with receiving all six elements of good practice†††††††††

	Discharge bundle given (N=11,144)	No discharge bundle given (N=8,169)
Six elements given (five given if non-smoker)	6,736 (60.4%)	514 (6.3%)
Six elements not given (five not given if non-smoker)	4,408 (39.6%)	7,655 (93.7%)

Those who received a discharge bundle were over 20 times as likely to receive all six elements of good practice compared to those who did not receive a discharge bundle (OR = 22.76, 95% CI 20.67 to 25.10). It may be that part of this association is because those who receive a discharge bundle are more likely to have these individual elements recorded than those who did not receive a discharge bundle.

********* The denominator excludes patients who died as inpatients.
††††††††† The denominator excludes patients who died as inpatients.

Section 8:

Benchmarked key indicators

To see aggregated, hospital-level data in full for patients admitted to hospital that were discharged between 1 April 2019 and 31 March 2020, please access the adult asthma secondary care clinical audit 2019-2020 data file available at: ***www.rcplondon.ac.uk/adult-asthma-2019-20****.*

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8.1 Benchmarking of key indicators for participating hospitals

Table 1 shows the rationale for the chosen key performance indicators for participating hospitals.

Please note that small case numbers should be treated with caution as they are less likely to provide an accurate picture of the average level of care delivered to patients across these key indicators.

Small numbers (between 1–4) have been suppressed (with the corresponding percentage also removed) to ensure that the identification of individual patients is not possible.

Table 1. Rationale for each process and outcome measure

Benchmarking dashboard performance indicator	Rationale
Process items / SIGN 2019 [9.2.6]	
Measurement of peak flow (PEF) within 1 hour of arrival	> There is low attainment nationally for measurement of PEF within 1 hour of arrival > Maps to **BTS/SIGN 2019 [9.2.3]**, **BTS/SIGN 2019 [9.2.6], NICE 2013 QS25 [QS7]**
Respiratory specialist review carried out within 24 hours	> This has been selected as the patient priority for the adult asthma clinical audit, as selected by the NACAP patient panel > Maps to **NICE 2013 QS25 [QS9**] > Patients in receipt of a respiratory specialist review were more likely to receive a discharge bundle and the associated elements of good practice care on discharge, as well as more likely to have their tobacco dependency addressed if a current smoker
Systemic steroids administered within 1 hour of arrival to hospital	> Poor current performance nationally > Maps to **NICE 2013 QS25 [QS8]** > Early administration of systemic steroids for asthma attacks is associated with better patient outcomes

Table 2 shows the performance indicators national medians, lower quartiles and upper quartiles for the key indicators that have been presented in the unadjusted benchmarking of hospitals (Table 2). The values presented in Table 2 have been derived by the method shown visually in the box and whisker plot (Fig 8). More specifically, to create the 'box', data for each key indicator were ordered numerically from smallest (whisker; P0) to largest (whisker; P100) to find the median (P50), the middle point of the values. The data are divided into two halves, which are then divided in half again to identify the lower quartile (P25) and the upper quartile (P75).

Table 2. The median and interquartile ranges for each key indicator

	Key indicators			
Median and interquartile ranges (%)	**Cases audited***	**Measurement of peak flow (PEF) within 1 hour of arrival (%)**	**Respiratory specialist review carried out within 24 hours (%)**	**Systemic steroids administered within 1 hour of arrival to hospital (%)****
Lower quartile	53	8	36	19
Median	96	15	50	26
Upper quartile	159	25	67	35

** The number of cases audited is not necessarily the denominator for any of the key indicators given.*
***For people receiving steroids after arrival in hospital who have not had steroids immediately prior to arrival*

The colours refer to the quartile in which each result lies:
Red = Result equal to or below lower quartile for that indicator
Amber = Result above lower quartile but below upper quartile for that indicator
Green = Result equal to or above upper quartile for that indicator
Grey = Not applicable as indicator not audited
- = Where numerator has been supressed and the percentage result is neither 0% nor 100%

Fig 8. Box and whisker plot

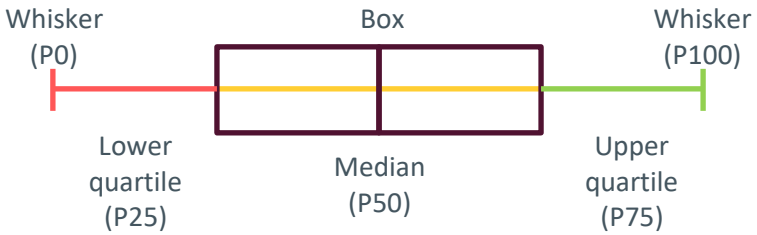

Table 3. Unadjusted benchmarking of key indicators for hospitals in England, Scotland and Wales

Hospital name	Trust / health board name	Cases audited	Measurement of peak expiratory flow (PEF) within 1 hour of arrival		Respiratory specialist review carried out within 24 hours		Systemic steroids administered within 1 hour of arrival to hospital[ii]	
			N	%	N	%	N	%
National average (mean)	**National**	**19,360**	**3,674**	**19%**	**10,142**	**52%**	**5,175**	**27%**
Addenbrooke's Hospital	Cambridge University Hospitals NHS Foundation Trust	195	33	17%	142	73%	28	14%
Airedale General Hospital	Airedale NHS Foundation Trust	148	39	26%	75	51%	32	22%
Barnet General Hospital	Royal Free London NHS Foundation Trust	83	9	11%	50	60%	14	17%
Barnsley District General Hospital	Barnsley Hospital NHS Foundation Trust	188	37	20%	82	44%	41	22%
Basildon Hospital	Basildon and Thurrock University Hospitals NHS Foundation Trust	82	<5	-	55	67%	35	43%
Basingstoke and North Hampshire Hospital	Hampshire Hospitals NHS Foundation Trust	86	10	12%	54	63%	28	33%
Bassetlaw District General Hospital	Doncaster and Bassetlaw Teaching Hospitals NHS Foundation Trust	46	6	13%	44	96%	13	28%
Bedford Hospital	Bedford Hospital NHS Trust	98	8	8%	65	66%	35	36%
Birmingham City Hospital	Sandwell and West Birmingham Hospitals NHS Trust	250	38	15%	167	67%	99	40%
Birmingham Heartlands Hospital	University Hospitals Birmingham NHS Foundation Trust	108	33	31%	89	82%	44	41%
Bradford Royal Infirmary	Bradford Teaching Hospitals NHS Foundation Trust	307	39	13%	65	21%	74	24%

[ii] For people receiving steroids after arrival in hospital who have not had steroids immediately prior to arrival

Hospital name	Trust / health board name	Cases audited	Measurement of peak expiratory flow (PEF) within 1 hour of arrival		Respiratory specialist review carried out within 24 hours		Systemic steroids administered within 1 hour of arrival to hospital[ii]	
			N	%	N	%	N	%
National average (mean)	**National**	**19,360**	**3,674**	**19%**	**10,142**	**52%**	**5,175**	**27%**
Bristol Royal Infirmary	University Hospitals Bristol NHS Foundation Trust	121	28	23%	55	45%	29	24%
Broomfield Chelmsford	Mid Essex Hospital Services NHS Trust	29	<5	-	7	24%	15	52%
Calderdale Royal Hospital	Calderdale and Huddersfield NHS Foundation Trust	109	13	12%	96	88%	21	19%
Charing Cross Hospital	Imperial College Healthcare NHS Trust	116	54	47%	72	62%	51	44%
Chelsea and Westminster Hospital	Chelsea and Westminster Hospital NHS Foundation Trust	77	24	31%	21	27%	35	45%
Cheltenham General Hospital	Gloucestershire Hospitals NHS Foundation Trust	53	15	28%	24	45%	15	28%
Chesterfield Royal	Chesterfield Royal Hospital NHS Foundation Trust	54	9	17%	24	44%	13	24%
Chorley Hospital	Lancashire Teaching Hospitals NHS Foundation Trust	69	7	10%	10	14%	28	41%
Colchester General Hospital	East Suffolk and North Essex NHS Foundation Trust	<5	0	0%	0	0%	0	0%
Conquest Hospital	East Sussex Healthcare NHS Trust	50	6	12%	27	54%	18	36%
Countess of Chester Hospital	Countess of Chester Hospital NHS Foundation Trust	48	<5	-	5	10%	13	27%
County Hospital (Stafford)	University Hospitals of North Midlands NHS Trust	59	<5	7%	21	36%	21	36%
Croydon University Hospital	Croydon Health Services NHS Trust	95	14	15%	22	23%	33	35%
Cumberland Infirmary	North Cumbria Integrated Care NHS Foundation Trust	14	<5	-	8	57%	10	71%

Hospital name	Trust / health board name	Cases audited	Measurement of peak expiratory flow (PEF) within 1 hour of arrival		Respiratory specialist review carried out within 24 hours		Systemic steroids administered within 1 hour of arrival to hospital[ii]	
			N	%	N	%	N	%
National average (mean)	**National**	**19,360**	**3,674**	**19%**	**10,142**	**52%**	**5,175**	**27%**
Darent Valley Hospital	Dartford and Gravesham NHS Trust	121	43	36%	41	34%	34	28%
Darlington Memorial Hospital	County Durham and Darlington NHS Foundation Trust	126	5	4%	73	58%	30	24%
Derriford Hospital	University Hospitals Plymouth NHS Trust	249	16	6%	114	46%	37	15%
Diana, Princess of Wales Hospital	Northern Lincolnshire and Goole NHS Foundation Trust	93	20	22%	10	11%	46	49%
Doncaster Royal Infirmary	Doncaster and Bassetlaw Teaching Hospitals NHS Foundation Trust	109	23	21%	93	85%	29	27%
Dorset County Hospital	Dorset County Hospital NHS Foundation Trust	88	13	15%	70	80%	18	20%
Ealing Hospital	London North West University Healthcare NHS Trust	327	114	35%	173	53%	96	29%
East Surrey Hospital	Surrey and Sussex Healthcare NHS Trust	148	19	13%	68	46%	57	39%
Eastbourne District General Hospital	East Sussex Healthcare NHS Trust	26	5	19%	8	31%	8	31%
Epsom Hospital	Epsom and St Helier University Hospitals NHS Trust	55	7	13%	45	82%	20	36%
Fairfield General Hospital	Pennine Acute Hospitals NHS Trust	8	<5	-	<5	-	<5	-
Friarage Hospital	South Tees Hospitals NHS Foundation Trust	<5	<5	-	<5	-	<5	-
Frimley Park Hospital	Frimley Health NHS Foundation Trust	109	29	27%	64	59%	28	26%

Hospital name	Trust / health board name	Cases audited	Measurement of peak expiratory flow (PEF) within 1 hour of arrival		Respiratory specialist review carried out within 24 hours		Systemic steroids administered within 1 hour of arrival to hospital[ii]	
			N	%	N	%	N	%
National average (mean)	**National**	**19,360**	**3,674**	**19%**	**10,142**	**52%**	**5,175**	**27%**
Furness General	University Hospitals of Morecambe Bay NHS Foundation Trust	50	12	24%	25	50%	13	26%
George Eliot Hospital	George Eliot Hospital NHS Trust	80	21	26%	29	36%	38	48%
Glenfield Hospital	University Hospitals of Leicester NHS Trust	335	136	41%	312	93%	35	10%
Gloucestershire Royal Hospital	Gloucestershire Hospitals NHS Foundation Trust	96	18	19%	56	58%	22	23%
Grantham and District General Hospital	United Lincolnshire Hospitals NHS Trust	36	16	44%	29	81%	15	42%
Harrogate District Hospital	Harrogate and District NHS Foundation Trust	95	21	22%	73	77%	26	27%
Hillingdon Hospital	The Hillingdon Hospitals NHS Foundation Trust	96	9	9%	43	45%	24	25%
Hinchingbrooke Hospital	North West Anglia NHS Foundation Trust	98	21	21%	42	43%	19	19%
Homerton Hospital	Homerton University Hospital NHS Foundation Trust	101	35	35%	40	40%	21	21%
Hull Royal Infirmary	Hull University Teaching Hospitals NHS Trust	267	12	4%	217	81%	34	13%
James Cook University Hospital	South Tees Hospitals NHS Foundation Trust	121	39	32%	86	71%	54	45%
James Paget Hospital	James Paget University Hospitals NHS Foundation Trust	138	35	25%	63	46%	30	22%
John Radcliffe Hospital	Oxford University Hospitals NHS Foundation Trust	36	5	14%	16	44%	6	17%
Kettering General Hospital	Kettering General Hospital NHS Foundation Trust	75	5	7%	12	16%	25	33%

Hospital name	Trust / health board name	Cases audited	Measurement of peak expiratory flow (PEF) within 1 hour of arrival		Respiratory specialist review carried out within 24 hours		Systemic steroids administered within 1 hour of arrival to hospital[ii]	
			N	%	N	%	N	%
National average (mean)	**National**	**19,360**	**3,674**	**19%**	**10,142**	**52%**	**5,175**	**27%**
King George Hospital	Barking, Havering and Redbridge University Hospitals NHS Trust	161	32	20%	139	86%	79	49%
King's College Hospital	King's College Hospital NHS Foundation Trust	148	47	32%	84	57%	48	32%
Kings Mill Hospital	Sherwood Forest Hospitals NHS Foundation Trust	116	8	7%	59	51%	58	50%
Kingston Hospital	Kingston Hospital NHS Foundation Trust	84	17	20%	31	37%	26	31%
Leicester Royal Infirmary	University Hospitals of Leicester NHS Trust	<5	<5	100%	0	0%	0	0%
Leighton Hospital	Mid Cheshire Hospitals NHS Foundation Trust	66	9	14%	13	20%	10	15%
Lincoln County Hospital	United Lincolnshire Hospitals NHS Trust	118	12	10%	58	49%	35	30%
Lister Hospital	East and North Hertfordshire NHS Trust	176	41	23%	157	89%	105	60%
Luton and Dunstable Hospital	Luton and Dunstable University Hospital NHS Foundation Trust	221	50	23%	187	85%	60	27%
Lymington New Forest Hospital	Southern Health NHS Foundation Trust	16	6	38%	5	31%	5	31%
Macclesfield District General Hospital	East Cheshire NHS Trust	14	<5	-	10	71%	<5	-
Maidstone General Hospital	Maidstone and Tunbridge Wells NHS Trust	103	9	9%	46	45%	36	35%
Manchester Royal Infirmary	Manchester University NHS Foundation Trust	147	96	65%	97	66%	37	25%
Manor Hospital	Walsall Healthcare NHS Trust	220	0	0%	131	60%	75	34%

Hospital name	Trust / health board name	Cases audited	Measurement of peak expiratory flow (PEF) within 1 hour of arrival		Respiratory specialist review carried out within 24 hours		Systemic steroids administered within 1 hour of arrival to hospital[ii]	
			N	%	N	%	N	%
National average (mean)	**National**	**19,360**	**3,674**	**19%**	**10,142**	**52%**	**5,175**	**27%**
Medway Maritime Hospital	Medway NHS Foundation Trust	134	18	13%	52	39%	47	35%
Milton Keynes General Hospital	Milton Keynes University Hospital NHS Foundation Trust	31	0	0%	18	58%	8	26%
Musgrove Park Hospital	Taunton and Somerset NHS Foundation Trust	146	39	27%	46	32%	40	27%
New Cross Hospital	The Royal Wolverhampton NHS Trust	99	10	10%	70	71%	35	35%
Norfolk and Norwich Hospital	Norfolk and Norwich University Hospitals NHS Foundation Trust	263	29	11%	188	71%	36	14%
North Devon District Hospital	Northern Devon Healthcare NHS Trust	36	8	22%	16	44%	13	36%
North Manchester General Hospital	Pennine Acute Hospitals NHS Trust	222	107	48%	90	41%	76	34%
North Middlesex Hospital	North Middlesex University Hospital NHS Trust	<5	0	0%	0	0%	0	0%
Northampton General Hospital	Northampton General Hospital NHS Trust	205	57	28%	68	33%	55	27%
Northern General Hospital	Sheffield Teaching Hospitals NHS Foundation Trust	108	29	27%	104	96%	17	16%
Northumbria Specialist Emergency Care Hospital	Northumbria Healthcare NHS Foundation Trust	155	16	10%	141	91%	26	17%
Northwick Park Hospital	London North West University Healthcare NHS Trust	294	33	11%	135	46%	86	29%
Nottingham City Hospital	Nottingham University Hospitals NHS Trust	123	28	23%	111	90%	23	19%
Peterborough City Hospital	North West Anglia NHS Foundation Trust	253	51	20%	51	20%	51	20%

Hospital name	Trust / health board name	Cases audited	Measurement of peak expiratory flow (PEF) within 1 hour of arrival		Respiratory specialist review carried out within 24 hours		Systemic steroids administered within 1 hour of arrival to hospital[ii]	
			N	%	N	%	N	%
National average (mean)	**National**	**19,360**	**3,674**	**19%**	**10,142**	**52%**	**5,175**	**27%**
Pilgrim Hospital	United Lincolnshire Hospitals NHS Trust	112	10	9%	49	44%	43	38%
Pinderfields General Hospital	Mid Yorkshire Hospitals NHS Trust	53	22	42%	43	81%	23	43%
Poole General Hospital	Poole Hospital NHS Foundation Trust	158	31	20%	79	50%	37	23%
Princess Alexandra Hospital	The Princess Alexandra Hospital NHS Trust	87	13	15%	57	66%	41	47%
Princess Royal Hospital (Haywards Heath)	Brighton and Sussex University Hospitals NHS Trust	<5	0	0%	0	0%	0	0%
Princess Royal University Hospital (Bromley)	King's College Hospital NHS Foundation Trust	34	0	0%	<5	-	6	18%
Queen Elizabeth Hospital, Edgbaston	University Hospitals Birmingham NHS Foundation Trust	270	10	4%	94	35%	43	16%
Queen Elizabeth Hospital, Gateshead	Gateshead Health NHS Foundation Trust	216	76	35%	147	68%	42	19%
Queen Elizabeth Hospital, Woolwich	Lewisham and Greenwich NHS Trust	85	<5	-	31	36%	31	36%
Queen Elizabeth The Queen Mother Hospital	East Kent Hospitals University NHS Foundation Trust	34	<5	-	15	44%	19	56%
Queens Hospital	University Hospitals of Derby and Burton NHS Foundation Trust	118	10	8%	72	61%	33	28%
Queens Hospital Romford	Barking, Havering and Redbridge University Hospitals NHS Trust	198	20	10%	165	83%	75	38%
Rotherham General Hospital	The Rotherham NHS Foundation Trust	71	8	11%	12	17%	21	30%
Royal Albert Edward Infirmary	Wrightington, Wigan and Leigh NHS Foundation Trust	57	<5	-	19	33%	8	14%

Hospital name	Trust / health board name	Cases audited	Measurement of peak expiratory flow (PEF) within 1 hour of arrival		Respiratory specialist review carried out within 24 hours		Systemic steroids administered within 1 hour of arrival to hospital[ii]	
			N	%	N	%	N	%
National average (mean)	**National**	**19,360**	**3,674**	**19%**	**10,142**	**52%**	**5,175**	**27%**
Royal Berkshire Hospital	Royal Berkshire NHS Foundation Trust	231	8	3%	147	64%	48	21%
Royal Blackburn Hospital	East Lancashire Hospitals NHS Trust	472	170	36%	339	72%	118	25%
Royal Bournemouth General Hospital	The Royal Bournemouth and Christchurch Hospitals NHS Foundation Trust	202	15	7%	105	52%	39	19%
Royal Cornwall Hospital	Royal Cornwall Hospitals NHS Trust	147	38	26%	70	48%	37	25%
Royal Derby Hospital	University Hospitals of Derby and Burton NHS Foundation Trust	166	19	11%	90	54%	44	27%
Royal Devon and Exeter Hospital	Royal Devon and Exeter NHS Foundation Trust	118	22	19%	85	72%	19	16%
Royal Free Hospital	Royal Free London NHS Foundation Trust	63	22	35%	41	65%	29	46%
Royal Hampshire County Hospital	Hampshire Hospitals NHS Foundation Trust	97	6	6%	79	81%	28	29%
Royal Lancaster Infirmary	University Hospitals of Morecambe Bay NHS Foundation Trust	63	6	10%	36	57%	13	21%
Royal Liverpool University Hospital	Liverpool University Hospitals NHS Foundation Trust	213	15	7%	70	33%	27	13%
Royal Oldham Hospital	Pennine Acute Hospitals NHS Trust	128	13	10%	32	25%	46	36%
Royal Preston Hospital	Lancashire Teaching Hospitals NHS Foundation Trust	89	11	12%	27	30%	32	36%
Royal Stoke University Hospital	University Hospitals of North Midlands NHS Trust	302	53	18%	76	25%	58	19%

Hospital name	Trust / health board name	Cases audited	Measurement of peak expiratory flow (PEF) within 1 hour of arrival		Respiratory specialist review carried out within 24 hours		Systemic steroids administered within 1 hour of arrival to hospital[ii]	
			N	%	N	%	N	%
National average (mean)	**National**	**19,360**	**3,674**	**19%**	**10,142**	**52%**	**5,175**	**27%**
Royal Surrey County Hospital	Royal Surrey County Hospital NHS Foundation Trust	87	10	11%	39	45%	14	16%
Royal Sussex County Hospital	Brighton and Sussex University Hospitals NHS Trust	17	<5	-	14	82%	6	35%
Royal United Hospital Bath	Royal United Hospitals Bath NHS Foundation Trust	111	13	12%	79	71%	16	14%
Royal Victoria Infirmary	The Newcastle Upon Tyne Hospitals NHS Foundation Trust	28	0	0%	6	21%	5	18%
Russells Hall Hospital	The Dudley Group NHS Foundation Trust	46	<5	-	29	63%	22	48%
Salford Royal Hospital	Salford Royal NHS Foundation Trust	165	41	25%	59	36%	32	19%
Salisbury District Hospital	Salisbury NHS Foundation Trust	103	24	23%	73	71%	30	29%
Sandwell District Hospital	Sandwell and West Birmingham Hospitals NHS Trust	146	7	5%	105	72%	46	32%
Scarborough General Hospital	York Teaching Hospital NHS Foundation Trust	168	5	3%	88	52%	49	29%
Scunthorpe General Hospital	Northern Lincolnshire and Goole NHS Foundation Trust	164	48	29%	84	51%	48	29%
South Tyneside District Hospital	South Tyneside and Sunderland NHS Foundation Trust	52	23	44%	34	65%	22	42%
Southampton General Hospital	University Hospital Southampton NHS Foundation Trust	63	14	22%	30	48%	15	24%
Southend Hospital	Southend University Hospital NHS Foundation Trust	203	21	10%	97	48%	45	22%
Southmead Hospital	North Bristol NHS Trust	218	58	27%	147	67%	44	20%

Hospital name	Trust / health board name	Cases audited	Measurement of peak expiratory flow (PEF) within 1 hour of arrival		Respiratory specialist review carried out within 24 hours		Systemic steroids administered within 1 hour of arrival to hospital[ii]	
			N	%	N	%	N	%
National average (mean)	**National**	**19,360**	**3,674**	**19%**	**10,142**	**52%**	**5,175**	**27%**
Southport and Formby District General	Southport and Ormskirk Hospital NHS Trust	190	40	21%	13	7%	37	19%
St George's Hospital	St George's University Hospitals NHS Foundation Trust	77	18	23%	44	57%	27	35%
St Helier Hospital	Epsom and St Helier University Hospitals NHS Trust	62	<5	-	32	52%	16	26%
St James's University Hospital	Leeds Teaching Hospitals NHS Trust	40	14	35%	32	80%	7	18%
St Mary's Hospital, Newport	Isle of Wight NHS Trust	28	<5	7%	10	36%	5	18%
St Marys Hospital, Paddington	Imperial College Healthcare NHS Trust	208	54	26%	115	55%	57	27%
St Peter's Hospital	Ashford and St Peter's Hospitals NHS Foundation Trust	96	27	28%	31	32%	41	43%
St Richards Hospital	Western Sussex Hospitals NHS Foundation Trust	73	8	11%	39	53%	9	12%
St Thomas Hospital	Guy's and St Thomas' NHS Foundation Trust	27	14	52%	27	100%	19	70%
Stepping Hill Hospital	Stockport NHS Foundation Trust	207	19	9%	34	16%	41	20%
Sunderland Royal Hospital	South Tyneside and Sunderland NHS Foundation Trust	178	44	25%	94	53%	55	31%
Tameside General Hospital	Tameside And Glossop Integrated Care NHS Foundation Trust	115	9	8%	16	14%	22	19%
Torbay Hospital	Torbay and South Devon NHS Foundation Trust	175	6	3%	51	29%	45	26%
Tunbridge Wells Hospital	Maidstone and Tunbridge Wells NHS Trust	35	<5	9%	17	49%	13	37%

Hospital name	Trust / health board name	Cases audited	Measurement of peak expiratory flow (PEF) within 1 hour of arrival		Respiratory specialist review carried out within 24 hours		Systemic steroids administered within 1 hour of arrival to hospital[ii]	
			N	%	N	%	N	%
National average (mean)	**National**	**19,360**	**3,674**	**19%**	**10,142**	**52%**	**5,175**	**27%**
University Hospital Aintree	Liverpool University Hospitals NHS Foundation Trust	25	<5	-	14	56%	6	24%
University Hospital Coventry	University Hospitals Coventry and Warwickshire NHS Trust	118	21	18%	83	70%	56	47%
University Hospital Lewisham	Lewisham and Greenwich NHS Trust	88	5	6%	51	58%	23	26%
University Hospital of North Durham	County Durham and Darlington NHS Foundation Trust	164	<5	-	87	53%	22	13%
University Hospital of North Tees	North Tees and Hartlepool NHS Foundation Trust	317	105	33%	120	38%	107	34%
Victoria Hospital	Blackpool Teaching Hospitals NHS Foundation Trust	107	<5	-	20	19%	7	7%
Warrington District General Hospital	Warrington and Halton Hospitals NHS Foundation Trust	67	7	10%	28	42%	10	15%
Warwick Hospital	South Warwickshire NHS Foundation Trust	94	16	17%	13	14%	29	31%
Watford General Hospital	West Hertfordshire Hospitals NHS Trust	6	0	0%	<5	-	<5	-
West Middlesex University Hospital	Chelsea And Westminster Hospital NHS Foundation Trust	61	17	28%	28	46%	29	48%
West Suffolk Hospital	West Suffolk NHS Foundation Trust	63	<5	-	20	32%	7	11%
Weston General Hospital	Weston Area Health NHS Trust	58	<5	-	14	24%	12	21%
Wexham Park Hospital	Frimley Health NHS Foundation Trust	178	38	21%	82	46%	60	34%
Whittington Hospital	Whittington Health NHS Trust	132	33	25%	76	58%	56	42%

Hospital name	Trust / health board name	Cases audited	Measurement of peak expiratory flow (PEF) within 1 hour of arrival		Respiratory specialist review carried out within 24 hours		Systemic steroids administered within 1 hour of arrival to hospital[ii]	
			N	%	N	%	N	%
National average (mean)	**National**	**19,360**	**3,674**	**19%**	**10,142**	**52%**	**5,175**	**27%**
William Harvey Hospital	East Kent Hospitals University NHS Foundation Trust	30	<5	-	11	37%	17	57%
Worcestershire Royal Hospital	Worcestershire Acute Hospitals NHS Trust	166	25	15%	64	39%	52	31%
Worthing Hospital	Western Sussex Hospitals NHS Foundation Trust	66	9	14%	25	38%	22	33%
Wythenshawe Hospital	Manchester University NHS Foundation Trust	180	57	32%	170	94%	38	21%
Yeovil District Hospital	Yeovil District Hospital NHS Foundation Trust	40	5	12%	30	75%	18	45%
York District Hospital	York Teaching Hospital NHS Foundation Trust	229	60	26%	148	65%	50	22%
Scotland (Please note the number of cases audited is not necessarily the denominator for any of the key indicators given)								
Dumfries and Galloway Royal Infirmary	Dumfries a& Galloway	50	14	28%	22	44%	16	32%
Inverclyde Royal Hospital	Greater Glasgow & Clyde	67	13	19%	47	70%	19	28%
Ninewells Hospital	Tayside	<5	0	0%	<5	100%	0	0%
Victoria Hospital (Kirkcaldy)	Fife	6	<5	-	6	100%	0	0%
Wishaw General Hospital	Lanarkshire	42	10	24%	30	71%	8	19%
Wales (Please note the number of cases audited is not necessarily the denominator for any of the key indicators given)								
Bronglais General Hospital	Hywel Dda University LHB	25	6	24%	18	72%	6	24%
Glan Clwyd Hospital	Betsi Cadwaladr University Health Board	44	7	16%	17	39%	<5	-

Hospital name	Trust / health board name	Cases audited	Measurement of peak expiratory flow (PEF) within 1 hour of arrival		Respiratory specialist review carried out within 24 hours		Systemic steroids administered within 1 hour of arrival to hospital[ii]	
			N	%	N	%	N	%
National average (mean)	**National**	**19,360**	**3,674**	**19%**	**10,142**	**52%**	**5,175**	**27%**
Glangwili General Hospital	Hywel Dda University LHB	13	0	0%	7	54%	<5	-
Llandough Hospital	Cardiff & Vale University LHB	94	31	33%	18	19%	13	14%
Morriston Hospital	Swansea Bay Local Health Board	159	28	18%	35	22%	37	23%
Nevill Hall Hospital	Aneurin Bevan University LHB	97	23	24%	52	54%	25	26%
Prince Charles Hospital	Cwm Taf Morgannwg University Local Health Board	70	18	26%	31	44%	6	9%
Princess Of Wales Hospital	Swansea Bay Local Health Board	134	67	50%	23	17%	24	18%
Prince Philip Hospital	Hywel Dda University LHB	28	6	21%	21	75%	7	25%
Royal Glamorgan	Cwm Taf Morgannwg University Local Health Board	51	6	12%	23	45%	6	12%
Singleton Hospital	Swansea Bay Local Health Board	116	7	6%	46	40%	<5	-
University Hospital of Wales	Cardiff & Vale University LHB	62	21	34%	35	56%	20	32%
Withybush General Hospital	Hywel Dda University LHB	11	0	0%	5	45%	<5	-

8.2 Non-participating hospitals in England, Scotland and Wales

The hospitals included in this list either did not register for the audit (denoted in grey), or were registered, but did not enter any data for the period reported on in this analysis.

Hospital name	Trust / health board name
England	
Arrowe Park Hospital	Wirral University Teaching Hospital NHS Foundation Trust
County Hospital Hereford	Wye Valley NHS Trust
Dewsbury District Hospital	Mid Yorkshire Hospitals NHS Trust
Good Hope General Hospital	University Hospitals Birmingham NHS Foundation Trust
Horton General Hospital	Oxford University Hospitals NHS Foundation Trust
Huddersfield Royal Infirmary	Calderdale and Huddersfield NHS Foundation Trust
Leeds General Infirmary	Leeds Teaching Hospitals NHS Trust
Newham General Hospital	Barts Health NHS Trust
Papworth Hospital	Royal Papworth Hospital NHS Foundation Trust
Princess Royal Hospital, Telford	Shrewsbury and Telford Hospital NHS Trust
Queen Alexandra Hospital	Portsmouth Hospitals NHS Trust
Queen Elizabeth Hospital, King's Lynn	The Queen Elizabeth Hospital, King's Lynn, NHS Foundation Trust
Royal Bolton Hospital	Bolton NHS Foundation Trust
Royal London Hospital	Barts Health NHS Trust
Royal Shrewsbury Hospital	Shrewsbury and Telford Hospital NHS Trust
Solihull General Hospital	University Hospitals Birmingham NHS Foundation Trust
Stoke Mandeville Hospital	Buckinghamshire Healthcare NHS Trust
The Great Western Hospital	Great Western Hospitals NHS Foundation Trust
The Ipswich Hospital	East Suffolk and North Essex NHS Foundation Trust
Trafford General Hospital	Manchester University NHS Foundation Trust
University College Hospital	University College London Hospitals NHS Foundation Trust
West Cumberland Infirmary	North Cumbria Integrated Care NHS Foundation Trust
Whipps Cross Hospital	Barts Health NHS Trust
Whiston Hospital	St Helens And Knowsley Teaching Hospitals NHS Trust
Scotland	
Forth Valley Royal Hospital	NHS Forth Valley

Hospital name	Trust / health board name
Aberdeen Royal Infirmary	NHS Grampian
Balfour Hospital	NHS Orkney
Belford Hospital	NHS Highland
Borders General Hospital	NHS Borders
Gartnavel General	NHS Greater Glasgow & Clyde
Gilbert Bain Hospital	NHS Shetland
Glasgow Royal Infirmary	NHS Greater Glasgow & Clyde
New Victoria Hospital	NHS Greater Glasgow & Clyde
Perth Royal Infirmary	NHS Tayside
Royal Alexandra Hospital	NHS Greater Glasgow & Clyde
Royal Infirmary of Edinburgh	NHS Lothian
St John's Hospital at Howden	NHS Lothian
Stobhill General Hospital	NHS Greater Glasgow & Clyde
University Hospital Ayr	NHS Ayrshire & Arran
University Hospital Crosshouse	NHS Ayrshire & Arran
University Hospital Hairmyres	NHS Lanarkshire
University Hospital Monklands	NHS Lanarkshire
Western General Hospital	NHS Lothian
Western Isles Hospital	NHS Western Isles
Wales	
Maelor Hospital	Betsi Cadwaladr University Health Board
Royal Gwent Hospital	Aneurin Bevan University Health Board
Ysbyty Gwynedd Hospital	Betsi Cadwaladr University Health Board
Ysbyty Ystrad Fawr	Aneurin Bevan University Health Board

Appendix A: Quality improvement priorities and recommendations in line with NCAPOP guidance

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Quality improvement priorities for providers

We have defined three key national quality improvement (QI) priorities for 2019/20, selected for their effectiveness in improving outcomes. These priorities are as follows for the next year:

1. **QI priority 1**: Assess 90% of patients for asthma severity which includes measurement of PEF within 1 hour of arrival. **(BTS/SIGN 2019 [Guideline recommendations: 9.2.3, 9.2.6])**
2. **QI priority 2**: Provide 90% of patients with a respiratory specialist review during hospital admission**. This is also the patient priority for the adult asthma clinical audit, as selected by the NACAP patient panel**. **(NICE 2013 QS25 [QS9])**
3. **QI priority 3:** Administer systemic steroids to 95% of patients within 1 hour of arrival to hospital, unless these have been administered as part of pre-hospital care **(NICE 2013 QS25 [QS8])**.

Recommendations for commissioners / health boards / sustainability transformation partnerships (STPs) and integrated care systems (ICSs)

1. Provide continuing support to enable local secondary care providers to participate in the NACAP adult asthma audit. **(NRAD 2014 [Organisation of NHS services – recommendation 6])**
2. Review local secondary care provider capacity to enable sufficient numbers of trained staff in the specialist respiratory team to review all patients admitted with an asthma attack.
3. Provide patients who are current smokers with access to high-quality smoking cessation services. **(BTS/SIGN 2019 [Guideline 6.2.3] / NICE 2013 QS43 [QS1-5])**
4. Treat each asthma death as a serious untoward incident (SUI) and ensure that these deaths are investigated.
5. Provide each patient admitted to hospital with an asthma attack with access to specialist care 24 hours a day, seven days a week.

Recommendations for primary care

1. Check that all asthma patients have an up to date and regularly reviewed personalised asthma action plan (PAAP). **(BTS/SIGN 2019 [Guideline 5.2.2, 14.3.1])**
2. Identify for review, asthma patients in receipt of more than two courses of systemic steroids in the last 12 months.
3. Refer to secondary care if options for optimising care are unclear, or where there is diagnostic uncertainty. **(NRAD 2014 [Organisation of NHS services – recommendation 2, 3])**
4. Provide adequate and continued asthma care training for staff. **(BTS/SIGN 2019 [Guideline 14.2])**

For people living with asthma and their families and carers

1. If you are admitted to hospital with an asthma attack, make sure that arrangements have been made to follow you up as an outpatient after discharge. **(NRAD 2014 [Organisation of NHS services – recommendation 3])**
2. If you are admitted to hospital with an asthma attack, ensure you ask for, and are provided with, a copy of your asthma care bundle (this includes having a personalised asthma action plan (PAAP) updated or issued). **(BTS/SIGN 2019 [Guideline 9.6])**

For patient-specific recommendations please view the adult asthma clinical audit patient report, available at: **www.rcplondon.ac.uk/adult-asthma-2019-20.**

Appendix B: Methodology

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Methodology of the audit creation and set up

A continuous national asthma audit was recommended in the 2014 National Review of Asthma Deaths report following the learnings from the confidential enquiry.[3] Subsequently, the Asthma Audit Development Project (AADP) was commissioned between February 2017 and February 2018 to carry out the groundwork required to set up a national audit of asthma care in adult and paediatric secondary care services, as well as primary care. This specifically involved the development of national audit datasets, including the precursor to the current adult asthma audit dataset.

The NACAP, which was commissioned from March 2018, launched the adult asthma audit component in November 2018. This is the second report since the start of continuous data collection and presents the results of the cohort of patients that were discharged from hospital between 1 April 2019 and 31 March 2020. The short report, presenting key findings and recommendations, can be found at: **www.rcplondon.ac.uk/adult-asthma-2019-20.** A quality improvement slide set and patient report is also provided.

All hospitals in England, Scotland and Wales (N=222) that admit adult patients with asthma attacks were eligible to participate in the audit. A total of 195 hospitals registered for the audit (88%) and 173 (78%) hospitals entered data for this period of the audit. A full list of non-participating hospitals, including those that registered but did not enter any data for the audit period, is provided in **Section 8**.

Information governance and data storage, security and transfer

This audit operates under Section 251 approval in England and Wales from the Confidentiality Advisory Group (CAG) of the Health Research Authority (reference number: CAG 8-06(b)/2013), as well as Public Benefit and Privacy Panel for Health approval (reference number: 1718-0134) in Scotland. These approvals allow hospitals to collect patient-identifiable data for the audit without consent due to the acuity of the cohort on arrival at hospital and the high number of admissions treated for asthma attacks annually. A record of these approvals can be found at:

- **www.hra.nhs.uk/about-the-hra/our-committees/section-251/cag-advice-and-approval-decisions** (April 2013 onwards; non research)
- **www.informationgovernance.scot.nhs.uk/pbpphsc/application-outcomes/** (Public Benefit and Privacy Panel Application Outcomes 2018-2019)

To find out more about the audit's information governance (IG), legal basis, data storage, security and transfer agreements, please review the adult asthma fair processing document, IG frequently asked questions (FAQs) and the audit's data flow diagram, all of which can be found on the audit resources page: **www.rcplondon.ac.uk/nacap-adult-asthma**. In addition, a patient information leaflet and poster are available to download from the same page.

Recruitment

The recruitment process for this audit started in June 2018 using the following channels:

- communication with hospitals in England and Wales participating in the COPD clinical audit
- direct communications to health board chief executives / medical directors as well as local respiratory network leads in Scotland
- partner and stakeholder channels
- NACAP launch information packs sent directly to trust / health board chief executives in England, Scotland and Wales
- NACAP Twitter and newsletters.

A two-step registration process was followed:

1. All hospitals were required to complete a registration form, providing the contact details and job title of a 'clinical lead' as well as a 'clinical audit lead'. Web tool accounts were set up for these contacts by the RCP audit team.
2. Hospitals in England and Wales were also required to forward a letter directly to their Caldicott Guardian. The letter provided an overview of the audit and the legal approvals in place to collect patient-identifiable data without consent. Caldicott Guardians were required to populate, sign and return a form to confirm approval in order for eligible hospitals in their trust / health board to take part. Only after both the registration form *and* Caldicott Guardian form were completed did the audit team at the RCP consider the hospital as fully registered and approve hospital access to the audit web tool.
    a. In Scotland, Caldicott Guardian approval was not required for individual hospitals / health boards as the Public Benefit and Privacy Panel for Health approval is deemed to be the ultimate information governance authorisation (precluding the need for any others). Therefore, teams were asked to forward a letter to their Caldicott Guardian for information purposes only.

The contacts provided within the hospital registration form were registered in the web tool as having one of two roles: 'lead clinician' or 'data inputter'. The former were able to approve the creation of new users for that hospital following the launch of the audit, as well as ensure that new users were suitable from an information governance perspective. The latter were able to create account requests for new users which required approval by the lead clinician.

The audit team chased the registration and Caldicott Guardian forms up to, and post launch of the audit.

Audit question development and pilot

The audit dataset was developed during the Asthma Audit Development Project (AADP)[§§§§§§§§§] and further streamlined by the audit programme team and clinical lead, in consultation with the NACAP asthma advisory group. A pilot audit was carried out between 1 August 2018 and 31 August 2018 as part of the dataset testing and finalisation process under the NACAP. Seventeen hospitals took part in the pilot and were asked to assess the comprehensibility of the questions and answers, ensure the help text and rationale was comprehensive, identify opportunities for streamlining the dataset and assess the strength and accuracy of validations applied within the web tool.

[§§§§§§§§§] For more information about the AADP and the development of the initial adult asthma audit dataset visit: www.rcplondon.ac.uk/projects/asthma-audit-development-project

Feedback from the pilot was discussed and reviewed by the NACAP team (including the analysis team at Imperial College London) before the dataset was amended and finalised ahead of the audit launch.********** Please note that all dataset items are mapped to relevant guidelines and standards. The dataset also includes a NACAP patient priority (developed following an extensive public survey, focus groups and discussion by the NACAP patient panel).

Data entry

Hospitals are required to enter data via the audit programme's bespoke web tool, created by Crown Informatics Ltd (available at **www.nacap.org.uk**).

Guidance documentation to support participation in the audit, such as the dataset with help notes, data collection sheets, audit technical guidance and FAQs are available to download from both the web tool (**www.nacap.org.uk**) and the adult asthma audit resources web page on the RCP website (**www.rcplondon.ac.uk/nacap-adult-asthma**). Data entry to the audit is regularly reviewed by the NACAP team. Reminders about audit data entry timelines, tailored to hospitals participating at different rates (ie hospitals with 0 records, less than 20 records, less than 50 records), are sent to registered teams to support continuous data collection. Data entry deadlines are also provided on the homepage of the audit web tool once users are logged in, as well as through NACAP newsletters. The NACAP team also communicate directly with non-participating hospitals to understand the reasons behind lack of participation, providing advice where possible.

Telephone and email support

The audit programme team at the RCP provide a helpdesk 9am – 5pm every working day, which is available via both telephone and email, so that participants can contact the team directly with any questions.

Analysis methodology

Deadline and data transfer

The data entry deadline for completion of records (patients discharged from hospital between 1 April 2019 and 31 March 2020) was 8 May 2020 at 23.59pm. Thereafter, the data were extracted by Crown Informatics Ltd, drafts were excluded and the data were anonymised as follows:

- NHS/CHI number replaced by an anonymised patient identifier
- postcode replaced by a Lower Layer Super Output Area (LSOA)
- date of birth replaced by calculated age.

NB Crown informatics Ltd also provided date of death data to Imperial College London for analysis.

The anonymised file, containing non-identifiable patient data, was then sent via secure file transfer to the analysis team at Imperial College London (National Heart and Lung Institute) where they were analysed.

********** Anonymised hospital feedback following the audit pilot is publically available at: www.rcplondon.ac.uk/projects/outputs/national-asthma-and-copd-audit-programme-nacap-secondary-care-workstream-adult

Case ascertainment

The overall case ascertainment figure for the audit data collection period, 35.8% (19,360/54,119 eligible admissions), provided on **page 6** of this report as derived on receipt of overall admission data from external data sources as follows:

- Data request applications for nation-level admission numbers were submitted to NHS Digital (NHSD) for Hospital Episode Statistics (HES) data, NHS Wales Informatics Service (NWIS) for Patient Episode Database for Wales (PEDW) data and the electronic Data Research and Innovation Service (eDRIS), part of NHS National Services Scotland.
- The specification for nation-level admissions numbers was as follows:
  - an overall figure for all adult patients coded with the following ICD-10 codes in the primary position of the first episode of care:
    - J45.0 – Predominantly allergic asthma
    - J45.1 – Non-allergic asthma
    - J45.8 – Mixed asthma
    - J45.9 – Asthma, unspecified
    - J46.0 – Status asthmaticus (*Includes:* Acute severe asthma)
  - including only patients aged 16 years and over on the date of arrival
  - including only patients that were discharged between 1 April 2019 and 31 March 2020)

Data cleaning and analysis

The data were analysed at Imperial College London (National Heart and Lung Institute) using R version 3.6.2. Times and dates were converted from string to date/time format using the as.POSIXct command. Time differences were obtained through the 'difftime' command. Dates were converted to days of the week using the 'weekdays' command. Four received datasets were combined: screened English data, unscreened Welsh and Scottish data, discharge date and time data (including for patients who died as inpatients) for screened English data, and discharge date and time data (including for patients who died as inpatients) for unscreened Welsh and Scottish data. There were a total of 19,647 records in the combined dataset.

Data checking and cleaning occurred sequentially as follows:

- All patients included in the analysis pertained to the correct audit period (discharged between 01/04/2019 and 31/03/2020).
- No patients had invalid values for heart rates, respiratory rates, oxygen saturation or peak flow.
- Patients marked as having a time for administration of beta agonists that was before their arrival date and time were removed (n=1).
- No patients had a time for administration of steroids that was before their arrival date and time.
- Patients with the time of their first recorded peak flow value over 1 hour before arrival were removed (n=22).
- No patients had a time for their respiratory review that was before their arrival date and time.
- No patients had a discharge time before their arrival date and time.
- Patients with first recorded peak flow values following arrival to hospital marked as not having a peak flow value, were removed (n=7).
- Patients marked as not having a previous peak flow, who had a previous peak flow value recorded, were removed (n=7).
- Patients who had both a predicted and previous peak flow value, when it should only be possible to enter one or the other, were removed (n=5).
- Patients with dates for when their first recorded peak flow value was recorded, who did not have peak flow values, were removed (n=3).

- Patients with a date for administration of systemic steroids, who were also marked as not administered steroids, were removed (n=23).
- Patients with a date for administration of beta agonists, who were also marked as beta agonists not recorded, were removed (n=5).
- Patients with a date recorded for their respiratory review, who were also marked as not having a respiratory review, were removed (n=4).
- Patients who were marked as having any of the specified discharge element options, and additionally were marked as having no elements, were removed (n=2).
- Patients had a discharge date and time that was before their arrival, peak flow measurement, administration of systemic steroids or beta agonists date and time, were removed (n=109).
- Duplicate records were removed (based on hospital code, trust code, country, patient ID, LSOA, age, gender, arrival date, and discharge date) (N=99).
- In total, 287 records were removed during the cleaning process.

Data analysis of the clean data (n=19,360) occurred as follows:

- Median and interquartile ranges were calculated using the 'quantile' command in R.
- Proportions were calculated using the 'table' and 'prop. table' command in R.
- The 'cut' function in R was used on continuous or discrete variables which required categorisation for analysis:
  - Day and time of arrival to hospital - split into 2-hour time categories
  - PEF as a % best/predicted PEF – split into <75% and ≥75%
  - Time from arrival until administration of systemic steroids - split into ≤1 hour and >1 hour/≤4 hours and >4 hours
  - Time from arrival until administration of beta agonists – spilt into ≤1 hour and >1 hour/≤4 hours and >4 hours
  - Time from arrival until discharge – split into ≤3 days and >3 days
  - The appropriate IMD quintile for England, Scotland and Wales was assigned to each patient using the patients' LSOA11 code. 369 patients did not have an LSOA11 code and so could not be linked to an IMD quintile.
  - Asthma severity was classified according to the NICE guideline thresholds for heart rate, respiratory rate, oxygen saturation (where measured) and peak flow (where measured). In addition, patients with a heart rate <30 bpm or a respiratory rate <10 breathes per minute were classified as severe. Patients recorded as 'Patient too unwell' for peak flow measurement whose other physiological measurements were normal were classified as severe.
  - Odds ratios with confidence intervals were calculated using the 'glm' command with a single explanatory variable connected to the outcome through a binomial logit link.
  - Kaplan-Meier curves were created using the 'survfit' package in R.

Appendix C: References

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1 British Thoracic Society (BTS) / Scottish Intercollegiate Guidelines Network (SIGN). *SIGN 153: British guideline on the management of asthma – A national clinical guideline.* [Updated July 2019]. www.brit-thoracic.org.uk/quality-improvement/guidelines/asthma/ [Accessed August 2020]

2 National Institute for Health and Care Excellence. *Smoking: supporting people to stop. NICE Quality standard 43 (QS43).* London: NICE, 2013. www.nice.org.uk/guidance/qs43 [Accessed August 2020]

3 Royal College of Physicians. *Why asthma still kills: The National Review of Asthma Deaths (NRAD) Confidential Enquiry report*. London: RCP, 2014. www.rcplondon.ac.uk/projects/outputs/why-asthma-still-kills [Accessed August 2020]

4 National Institute for Health and Care Excellence. *Asthma*. *NICE Quality standard 25 (QS25)*. London: NICE, 2018. www.nice.org.uk/guidance/qs25 [Accessed August 2020]

5 O'Driscoll BR, Howard LS, Earis J, Mak V. BTS guidelines for oxygen use in adults in healthcare and emergency settings. *Thorax* 2017;72:i1–i90

6 Rowe BH, Spooner C, Ducharme F *et al.* Early emergency department treatment of acute asthma with systemic corticosteroids*. Cochrane Database Syst Rev* 2001;(1):CD002178.

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