Maps

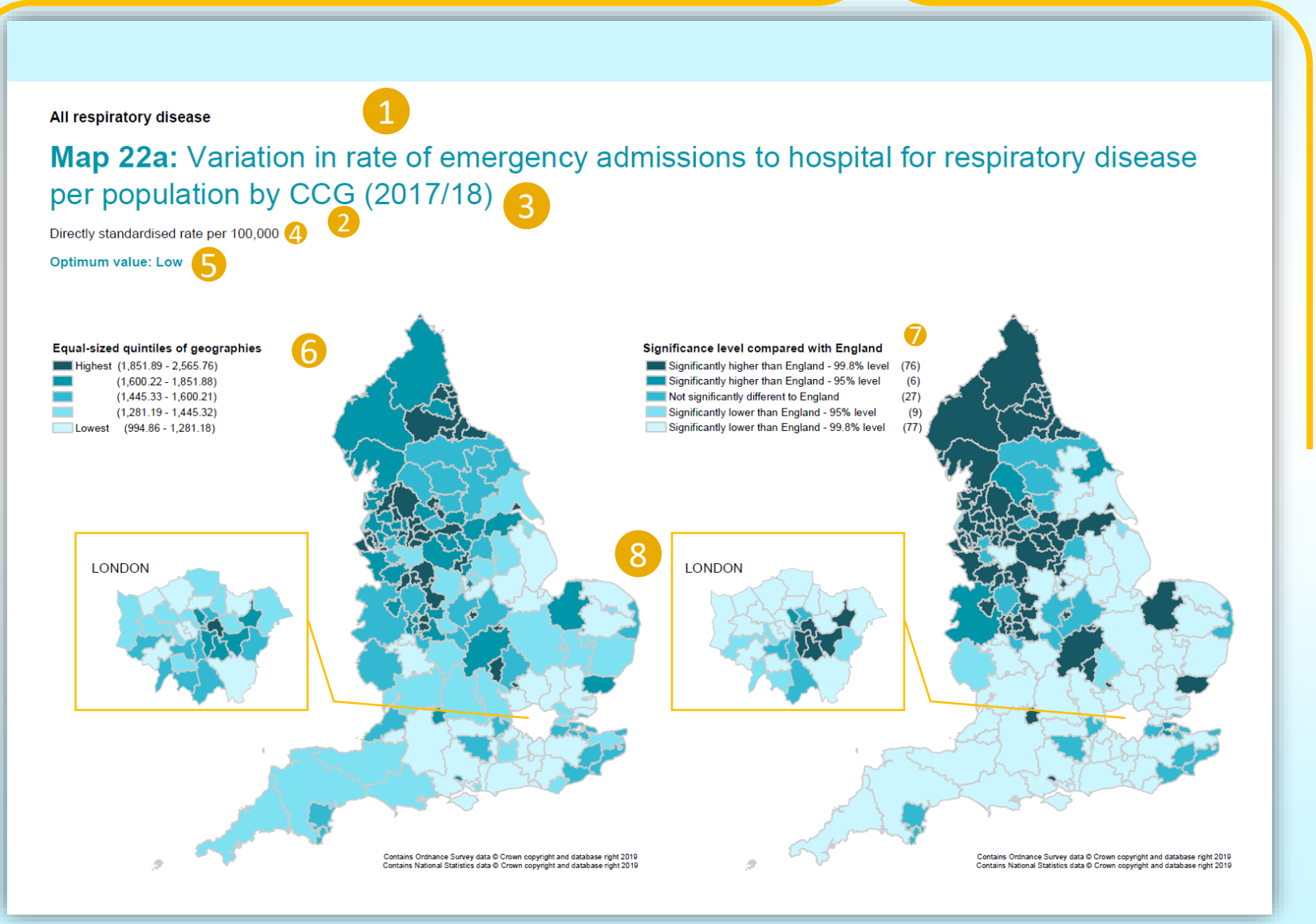
1 **Type of statistic** (e.g. rate, proportion)

2 **Geographic boundaries**

3 **Year of data presented**

4 **Rate calculated per x number of people**

5 **Optimum values** Low indicates lower values are preferential (high indicates higher values are preferential). Local interpretation maybe required for some indicators.



6 **Equal sized quintiles** The number of areas presented on the map are divided equally between the 5 categories with those with the highest values forming the 'Highest' group etc.

For example, in 2018 there were 195 CCGs, so 39 CCGs are in each category. Darker areas have the highest values.

7 **Significance level compared with England** The darkest and lightest shading on map shows CCGs whose confidence intervals do not overlap with the England value.

The second darkest and lightest colours show areas where the England value falls between the CCG's 95% and 99.8% CI.

The number in brackets indicates the number of CCGs in each category.

8 **London** is presented as a separate zoomed in map for clarity.

Quick user guide

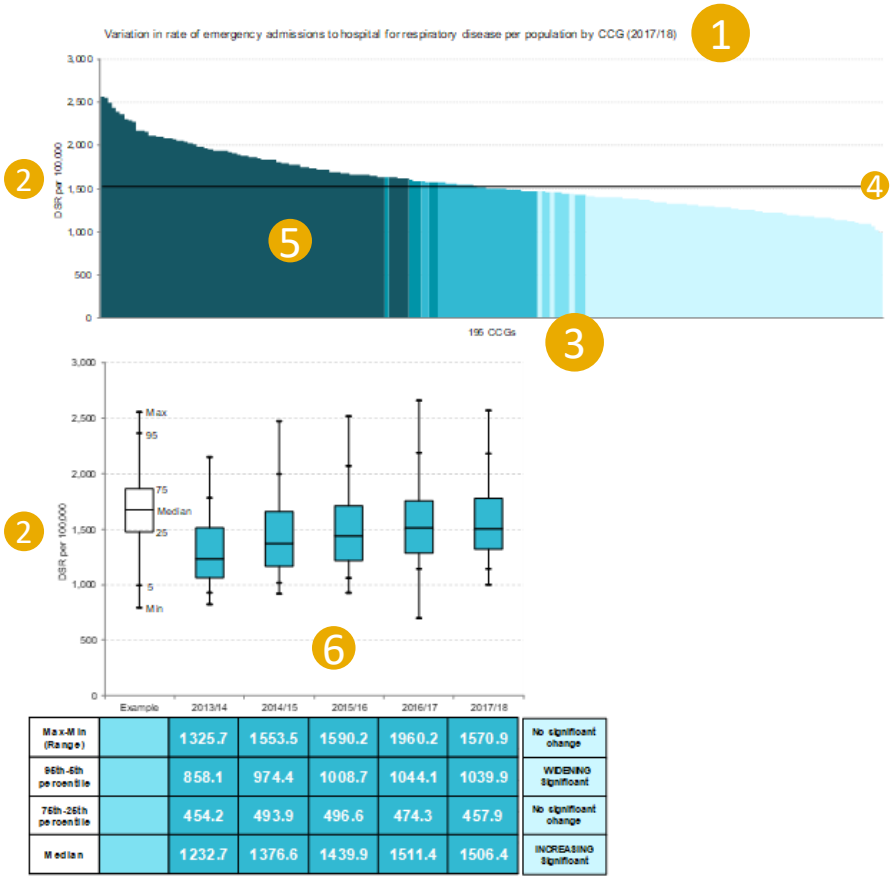
Chart, box plot and table

1. Title shows indicator details including: value type, geography and year .

2. The y-axis plots the value and gives details of the value type e.g. rate / proportion and the unit e.g. per 100,000 population.

3. The x-axis shows the geography and the number of areas on chart.

4. The line shows the England average.



5. Each bar represents an area (e.g. a CCG). The height of the bar is relative to the value for that area. Collectively, the bars show the spread of values across England.

   The colour of the bar represents how significant the area's value is in relation to England based on the area's confidence interval. Areas utilise the same colours and categories as the maps.

   Areas that are significantly higher than England at a 99.8% or 95% level are shown as darker bars whereas those with lower significance to England, at a 99.8% or 95% level, are lighter. The colour in the middle represents areas that are not significantly different from England.

   Where the significance bar chart shows little variation across the CCGs, the equal interval map colours have been used.

6. For each indicator, data is presented visually in a time series of box and whisker plots. The box plots show the distribution of data.

   The line inside each box shows the median (the mid-point, so if the 195 CCGs were sorted in order of value, the value halfway between the CCGs in the 97th and 98th position would give the median). The bottom and top of the teal box represents the values which 25% and 75% of the areas fall below. 50% of the areas have a value within this range.

   The whiskers mark the values at which 5% and 95% of areas fall below. The median and maximum values are also shown.

   The time series allows us to see how the median has changed over time, but also whether the gap between the extreme values has changed.

   The table accompanying the box and whisker plots shows whether there has been any statistically significant change in the median, or in the degree of variation over time.

7. **Sections in the chapter**

   Context – provides an overview of why the indicator is of public health interest

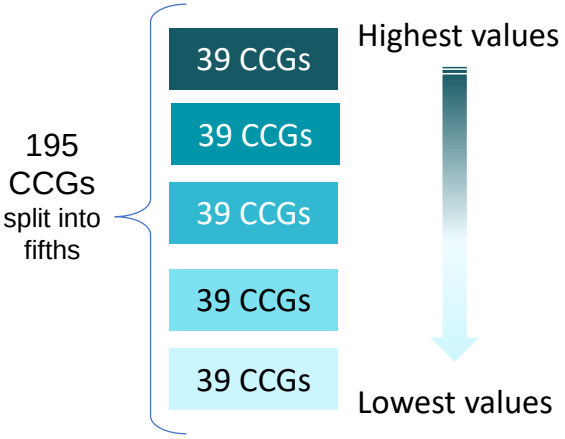
   Magnitude of variation – provides commentary in relation to the chart, box plot and table

   Option for action – gives suggestions for best practice

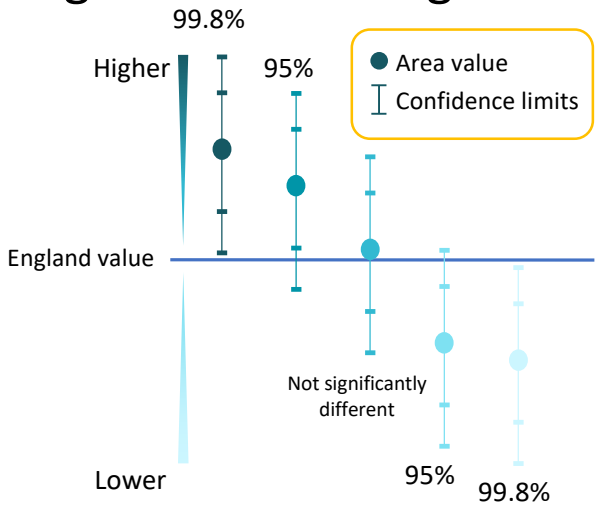
   Resources – gives links to useful documents

How were the categories calculated?

Equal-sized quintiles



Significance to England



Confidence intervals give an estimated range in which the true CCG value lies.

Where the CCG's confidence interval does not overlap with the England value, the CCG is classed as being *significantly higher or lower than England at a 99.8% level*.

If the England value lies between the 99.8% and 95% CI, this value is classed as being *significantly higher or lower than England at a 95% level*.

Where the England value is between the upper and lower 95% CI, the CCG is classed as *not being significantly different from England*.

Box & whisker plot

Whiskers
Show the extreme values in the dataset.

Box
50% of the data values lie between the 25th and 75th percentile. The distance between these is known as the inter-quartile range (IQR).

Maximum The value of the area with the highest value.

95th percentile 95% of areas have values below this.

75th percentile 75% of areas have values below this.

Median (50th percentile) The median is the middle value of an ordered dataset. Half of the observations are below it and half above.

25th percentile 25% of areas have values below this.

5th percentile 5% of areas have a value below this.

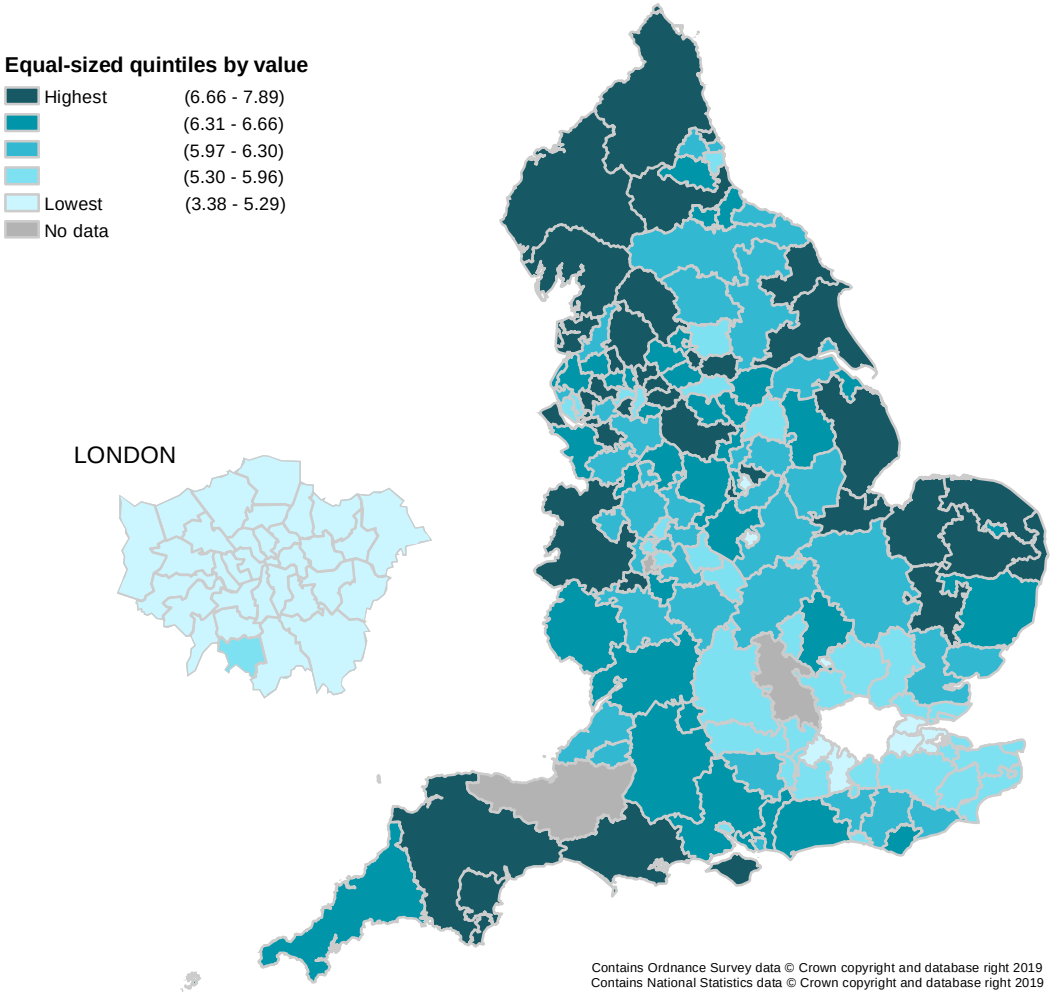
Minimum The value of the area with the lowest value.

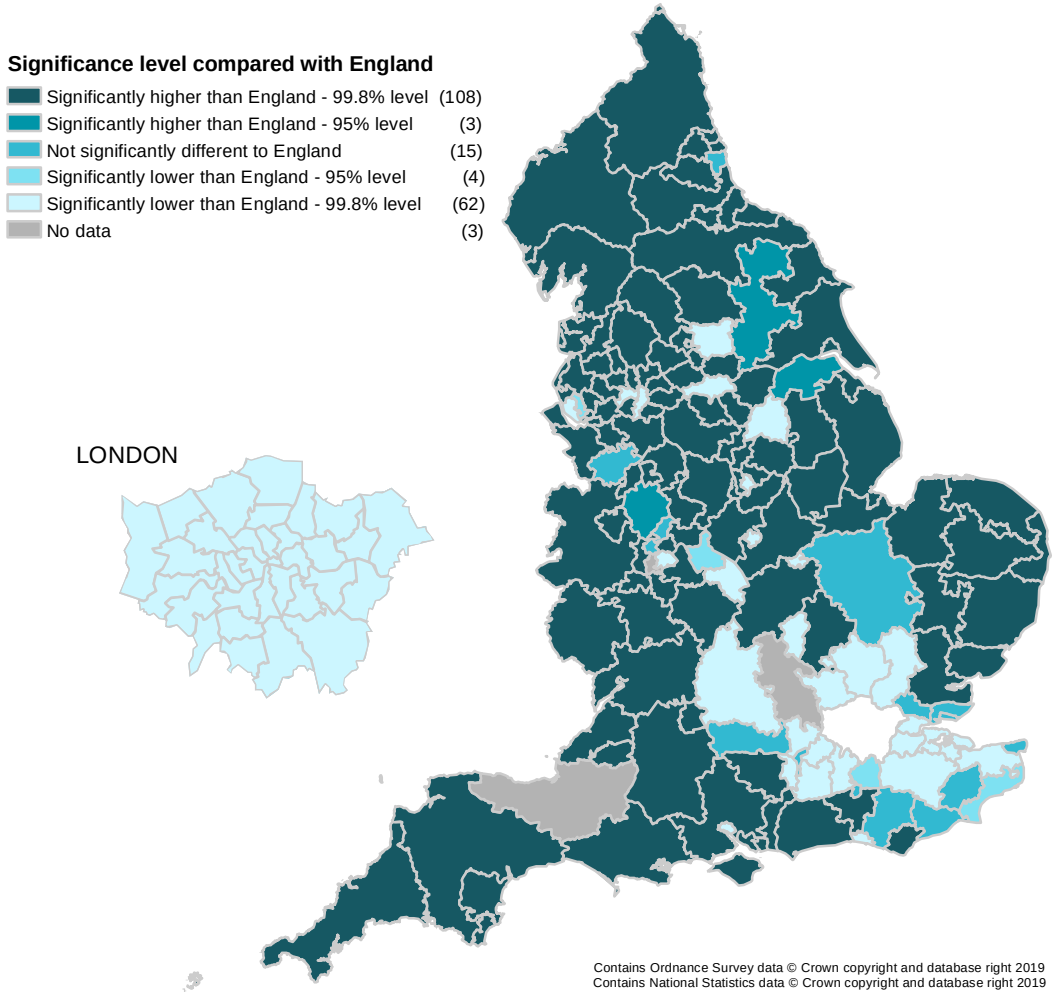
Box plot percentile	CCG rank position (195 CCGs in 2018)
Max	195
95%	Mid value between values of CCGs in ranks 185 and 186
75%	Mid value between values of CCGs in ranks 146 and 147
50% - Median	Mid value between values of CCGs in ranks 97 and 98
25%	Mid value between values of CCGs in ranks 48 and 49
5%	Mid value between values of CCGs in ranks 9 and 10
Min	1

Asthma – Primary care - Diagnosis

Map 13a: Variation in percentage of patients with asthma on GP registers by CCG (2017/18)

Optimum value: Requires local interpretation

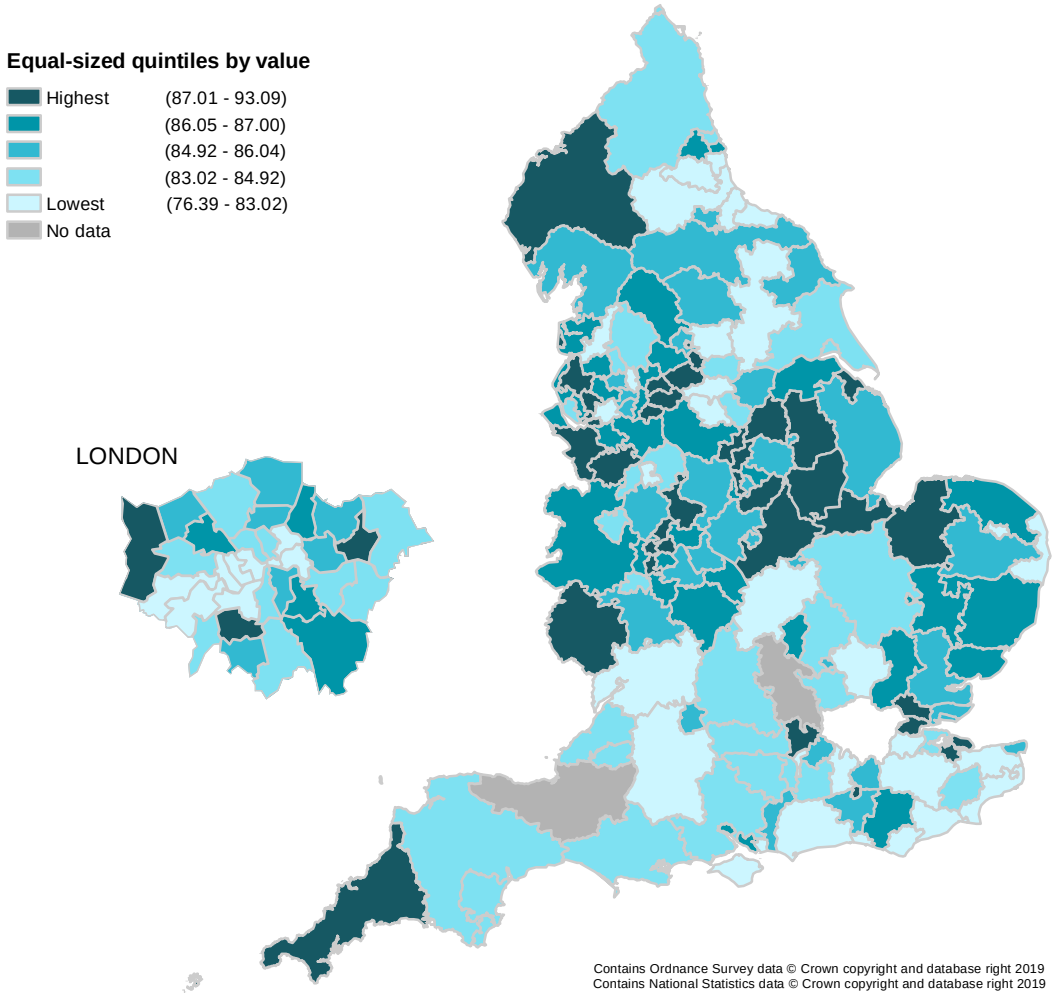


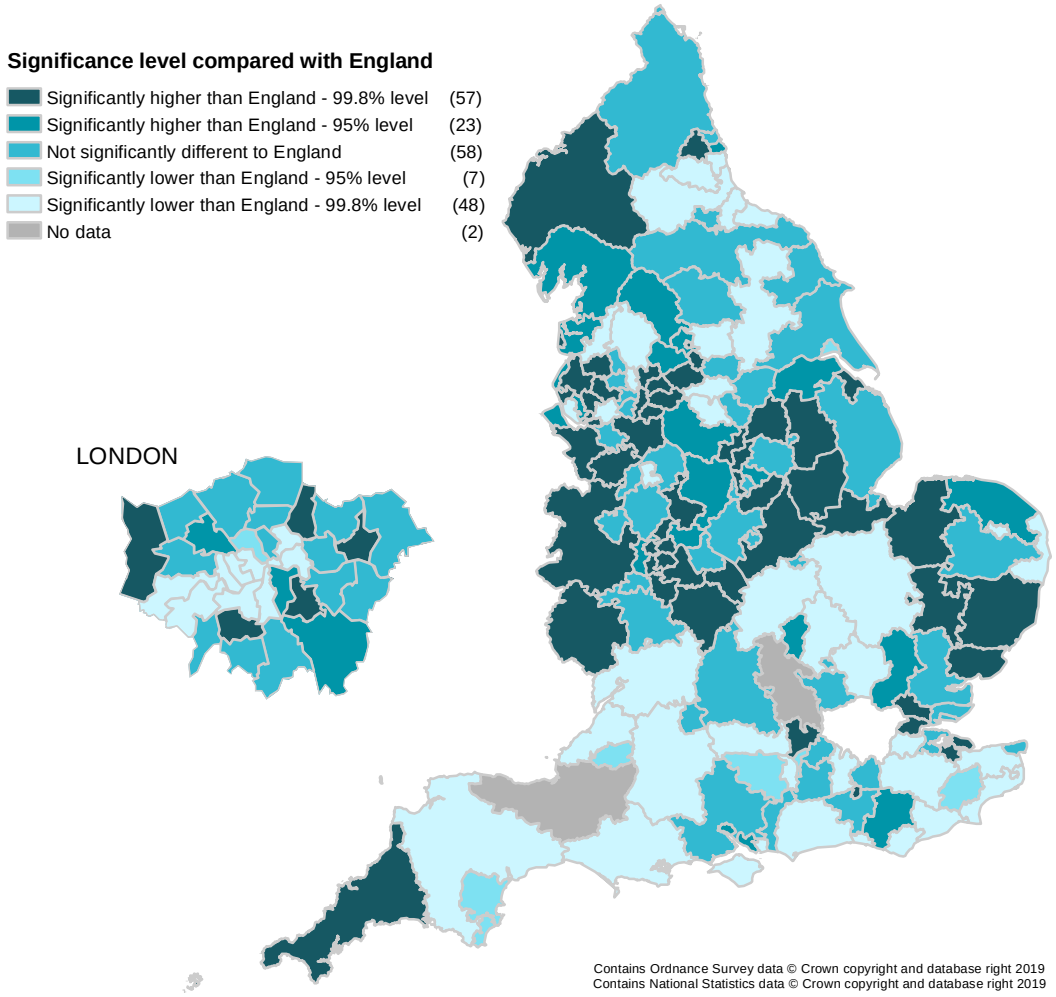


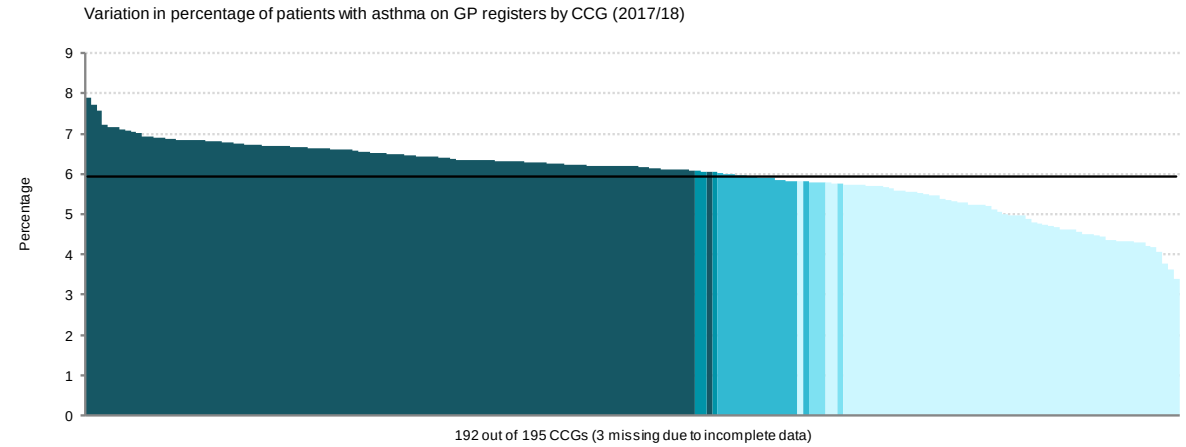
Asthma – Primary care - Diagnosis

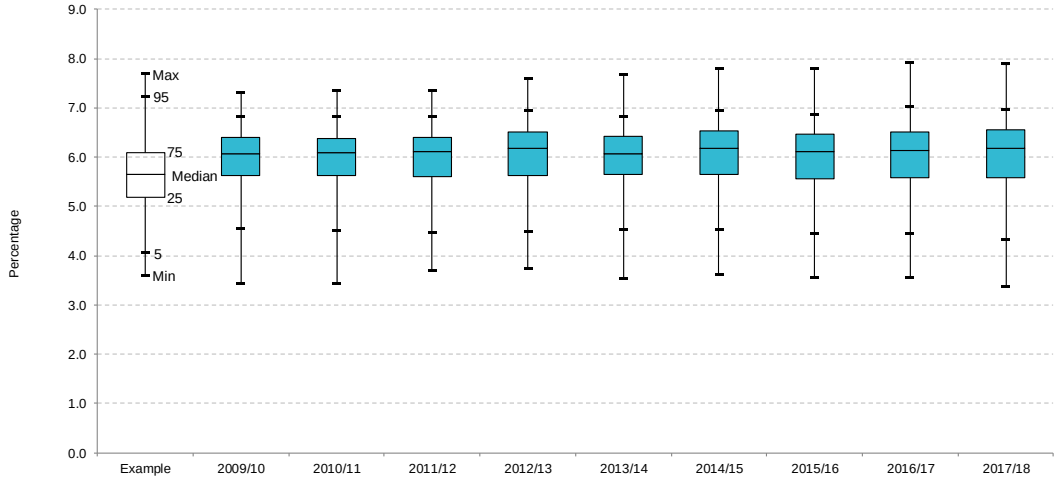
Map 13b: Variation in percentage of patients with asthma on GP registers aged 8 years or over, in whom measures of variability or reversibility are recorded (including exceptions) by CCG (2017/18)

Optimum value: High









		2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	
Max-Min (Range)		3.9	3.9	3.7	3.9	4.1	4.2	4.3	4.4	4.5	WIDENING Significant
95th-5th percentile		2.3	2.3	2.4	2.5	2.3	2.4	2.4	2.6	2.6	WIDENING Significant
75th-25th percentile		0.8	0.7	0.8	0.9	0.8	0.9	0.9	0.9	1.0	WIDENING Significant
Median		6.1	6.1	6.1	6.2	6.1	6.2	6.1	6.1	6.2	No significant change

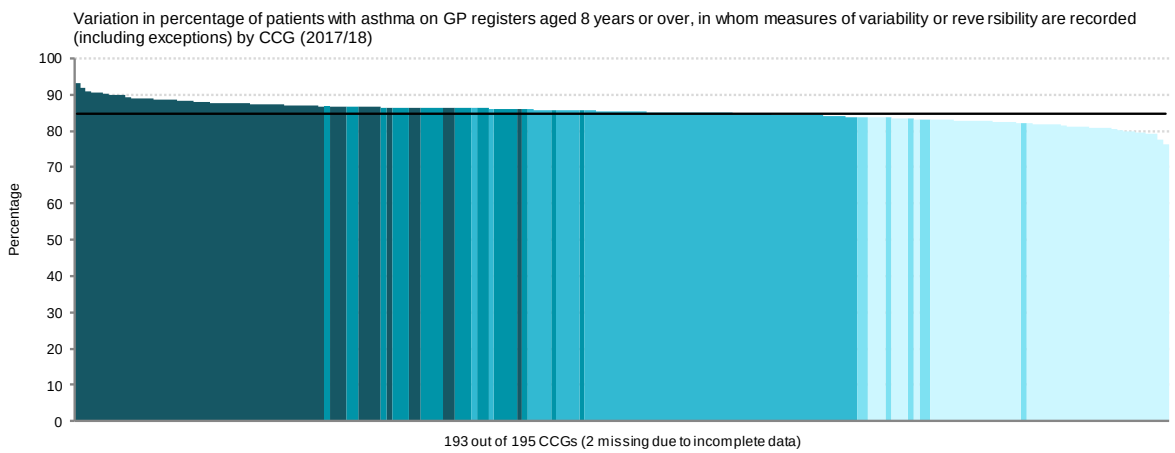
Context

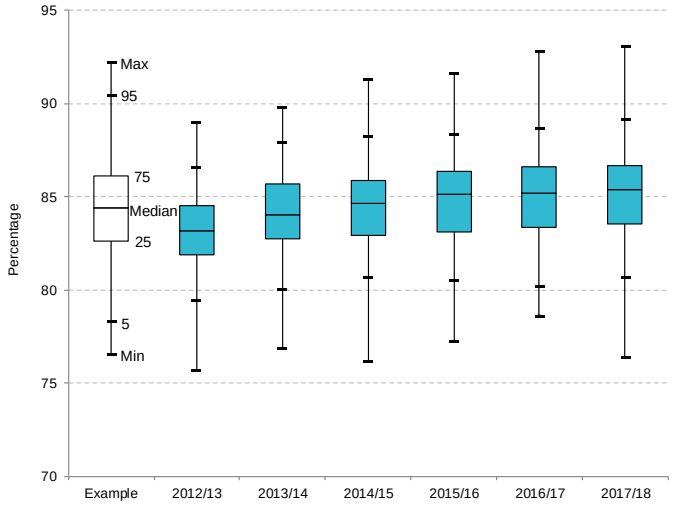
Asthma is an inflammatory disorder affecting the airways, characterised by breathlessness, wheezing and coughing particularly at night. The most common type of asthma is allergic asthma triggered by immunoglobulin E (IgE) antibodies generated in response to environmental allergens such as dust mites, pollen and moulds. Consistent platelet-activating factor (PAF%) values from many studies suggest a median of 15% of asthma can be attributable to workplace exposures.[1]

In 2017/18, the prevalence of asthma in England, defined as receiving asthma treatment in the last year, and based on data from GP QOF registers, was 6.0%.[2] It is generally accepted that this is a conservative estimate based on known under reporting. The 2010 Health Survey for England indicated 9.5% of adults and children reported having asthma according to this definition, suggesting that many people with asthma are not included in GP registers.[3]

Most of the care for people with asthma is provided in primary care. The chronic disease management delivered by GPs and nurses is likely to have a considerable impact on outcomes such as symptom control, quality of life, physical and social activity, admission to hospital and mortality. Accurate diagnosis and inclusion on disease registers in primary care are essential prerequisites for structured pro-active asthma care.

Under the QOF scheme, GPs are rewarded for achieving an agreed level of population coverage for each indicator. In calculating coverage, practices are allowed to exclude appropriate patients (known as exceptions) from the target population to avoid being penalised for factors beyond the





Max-Min (Range)		13.3	12.9	15.2	14.4	14.2	16.7	No significant change
95th-5th percentile		7.1	7.9	7.5	7.8	8.5	8.5	WIDENING Significant
75th-25th percentile		2.6	2.9	3.0	3.3	3.3	3.1	WIDENING Significant
Median		83.2	84.0	84.6	85.1	85.2	85.4	INCREASING Significant

practices' control, for example when patients do not attend for review despite repeated invitations, or if a medication cannot be prescribed due to a contraindication or side-effect. In 2017/18, 1,364 GP practices out of a total of 7,100 in England (19%) had more than 10% of their local population with asthma excepted from QOF Asthma reporting.[2]

The exception-adjusted population coverage is reported annually by NHS Digital.[4] The analysis presented in this Atlas aims to show the intervention rate so includes exceptions within the denominators (see 'Introduction to the data').

Both the British Thoracic Society/Scottish Intercollegiate Guidelines Network (BTS/SIGN) and NICE guidelines agree that no one symptom, sign or test is diagnostic for asthma. Both guidelines recommend that in the absence of unequivocal evidence of asthma, a diagnosis should be 'suspected' and that initiation of treatment (typically inhaled steroids) should be monitored carefully and the diagnosis reviewed if there is no objective benefit.

Once a diagnosis is made, both BTS/SIGN and NICE guidelines emphasise the importance of recording the basis on which the diagnosis was made. Accurate diagnosis requires careful history taking. History, in particularly asking what individuals do for a job, can identify asthma with a known cause (for example occupational asthma), and thus interventions may be possible to improve reliance on treatments and improve outcomes. Diagnosis should also be supported by objective tests including spirometry and exhaled nitric oxide. This may involve trying different therapy options and several consultations.

Spirometry is positioned as pivotal by both guidelines, but both caution that it is not useful for ruling out asthma

because the sensitivity is low, especially in primary care populations. An exception to this is in children under 5 years old, where diagnosis should be based on observation and clinical judgement until the child is able to perform objective tests. Use of inhaler treatment without full assessment and follow-up may relieve some symptoms but mask the diagnosis.

Magnitude of variation

Map 13a: Variation in percentage of patients with asthma on GP registers by CCG (2017/18)

The maps and column chart display the latest period (2017/18), during which CCG values ranged from 3.4% to 7.9%, which is a 2.3-fold difference between CCGs. The England value for 2017/18 was 5.9%.

The box plot shows the distribution of CCG values for the period 2009/10 to 2017/18. There has been significant widening of all 3 measures of variation.

Map 13b: Variation in percentage of patients with asthma on GP registers aged 8 years or over, in whom measures of variability or reversibility are recorded (including exceptions) by CCG (2017/18)

The maps and column chart display the latest period (2017/18), during which CCG values ranged from 76.4 to 93.1%, which is a 1.2-fold difference between CCGs. The England value for 2017/18 was 84.9%.

The box plot shows the distribution of CCG values for the period 2012/13 to 2017/18. Both the 95th to 5th percentile gap and the 75th to 25th percentile gap widened significantly. The median increased significantly from 83.2% in 2012/13 to 85.4% in 2017/18.

The degree of variation observed would indicate that many people with asthma are not on GP registers. As a result, such people may not receive a regular clinical review to ensure that symptoms are controlled and to support self-management. It is important to develop a personalised asthma action plan (PAAP) to prevent the consequences of poor control, which include: a disruption of daily activities, reduced quality of life, increased risk of exacerbations, increased consultation rate, increased emergency department visits, increased hospital admissions, and premature death. Risk factors for asthma (occupational and air quality for example) may also be geographically different which might explain some of the variation seen.

Options for action

In all localities, commissioners and practices need to investigate variation in the reported prevalence of asthma at practice level. Some commissioners may wish to consider establishing asthma diagnostic hubs to facilitate implementation of recommendations relating to asthma diagnosis.

Commissioners need to ensure that primary care staff are adequately trained and supported by accessible diagnostic services to diagnose asthma accurately, in line with the BTS/SIGN clinical guidelines (see ‘Resources’).

It is advisable for practices to audit their records regularly to identify patients who are on asthma medication, or who have had an emergency attendance or admission for asthma, but who do not have a diagnosis of asthma recorded in their notes. It is important to review these patients to have their diagnosis confirmed and entered into the practice records, so that appropriate treatment and self-management support can be initiated.

Resources

British Thoracic Society (BTS) and Scottish Intercollegiate Guidelines Network (SIGN) (2019) British guideline on the management of asthma. A national clinical guideline [Accessed 2 August 2019]

Department of Health (2011) An outcomes strategy for people with chronic obstructive pulmonary disease (COPD) and Asthma in England [Accessed 30 January 2019]

Department of Health (2012) An Outcomes Strategy for COPD and Asthma: NHS Companion Document [Accessed 30 January 2019]

IMPRESS – IMProving and integrating RESpiratory Services in the NHS [Accessed 30 July 2019]

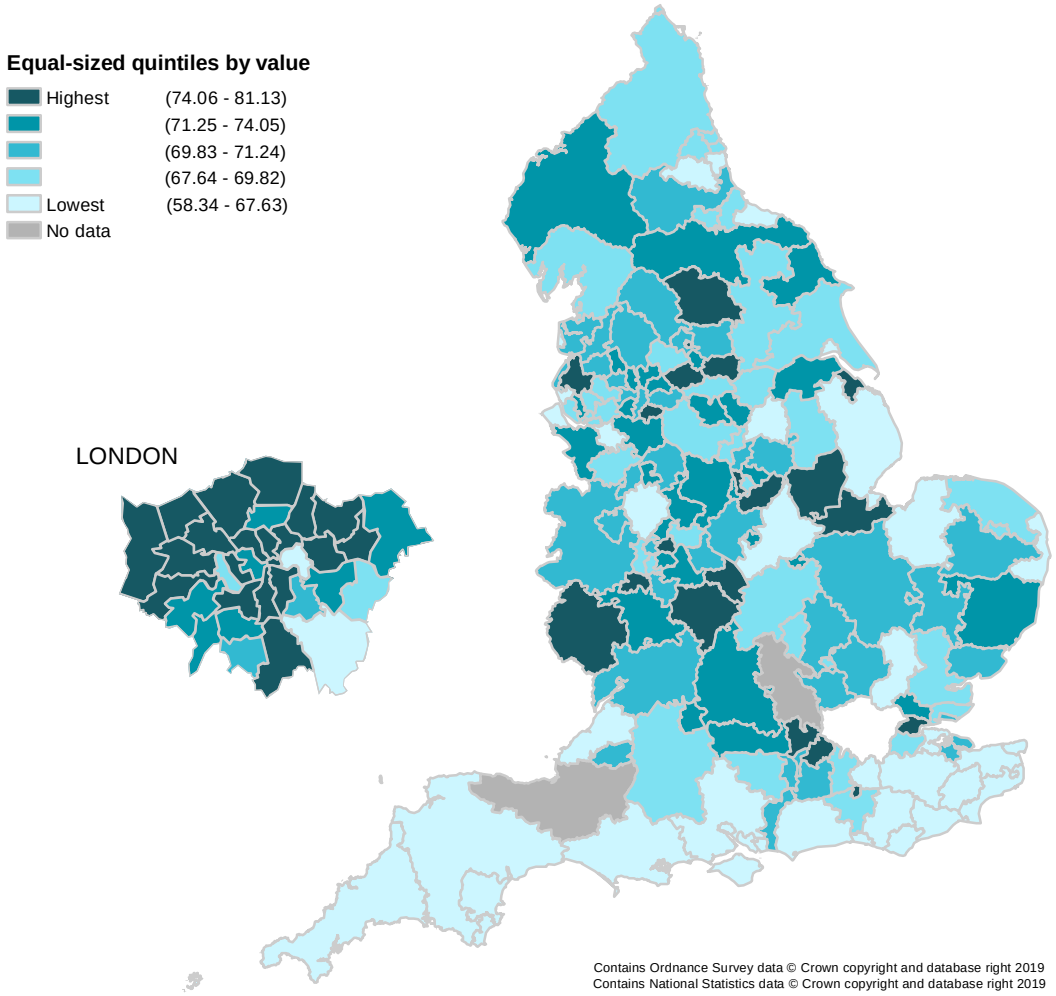
National Institute of Health and Care Excellence (2017) Asthma: diagnosis, monitoring and chronic asthma management (NICE guideline [NG80]) [Accessed 17 July 2019]

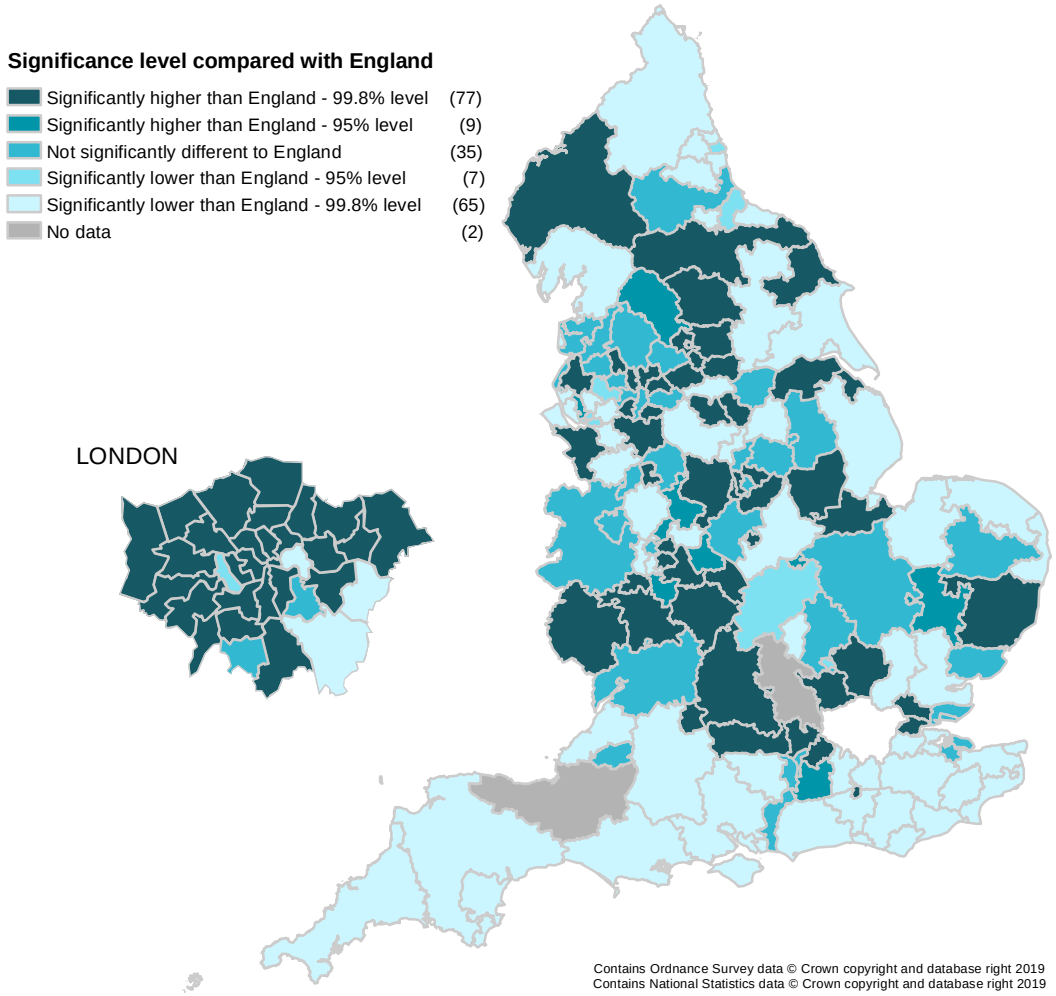
[1] Balmes J, Becklake M, Blanc P and others American Thoracic Society Statement: Occupational contribution to the burden of airway disease American Journal of Respiratory and Critical Care Medicine 167:787-797 doi: 10.1164/rccm.167.5.787 [Accessed 1 August 2019]
[2] NHS Digital (2018) Quality and Outcomes Framework, Achievement, prevalence and exceptions data - 2017-18 [PAS] [Accessed 6 May 2019]
[3] NHS Digital (2011) Health Survey for England 2010 – Respiratory health. [Accessed 6 May 2019]
[4] NHS Digital Quality Outcomes Framework, Disease prevalence and care quality achievement rates [Accessed 10 June 2019]

Asthma – Primary care - Review

Map 14a: Variation in percentage of patients with asthma on GP registers who had a review in the last 12 months that included an assessment of asthma control using the 3 RCP questions (including exceptions) by CCG (2017/18)

Optimum value: High

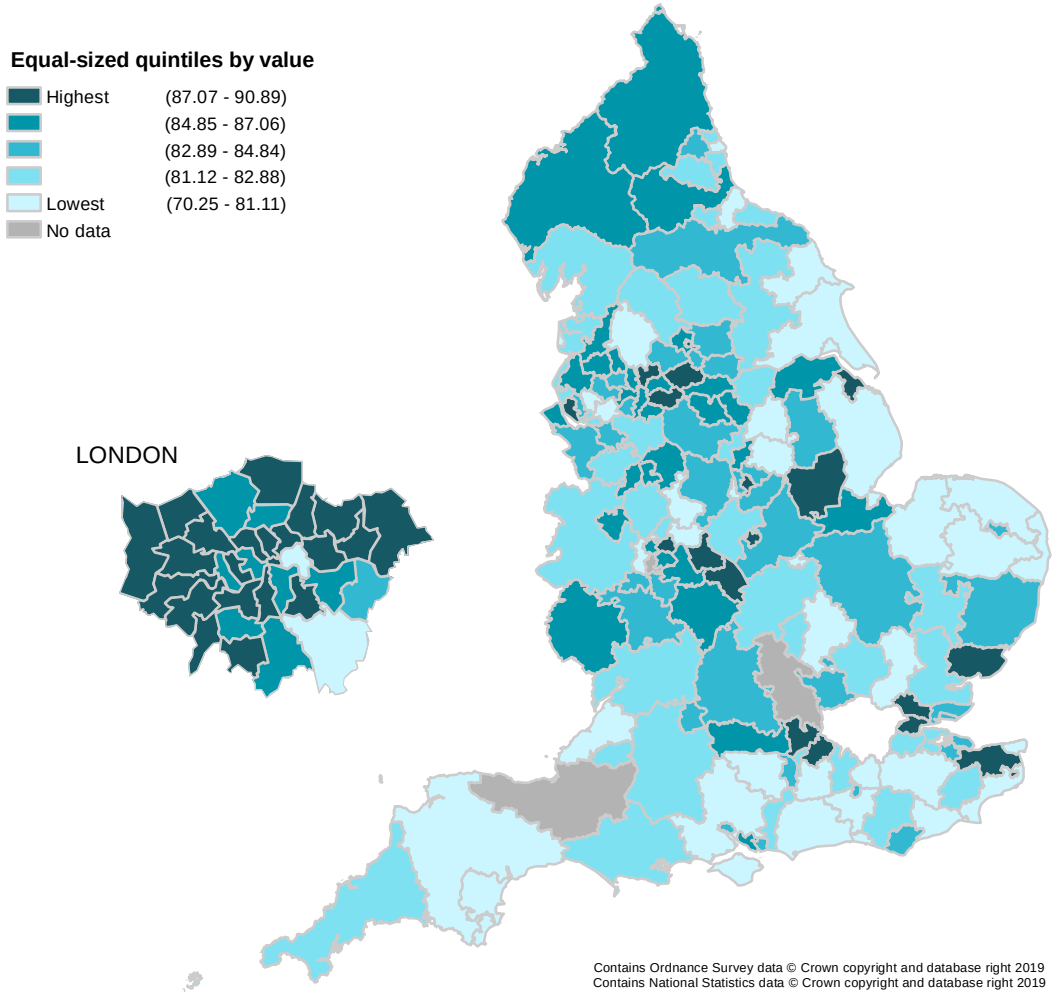


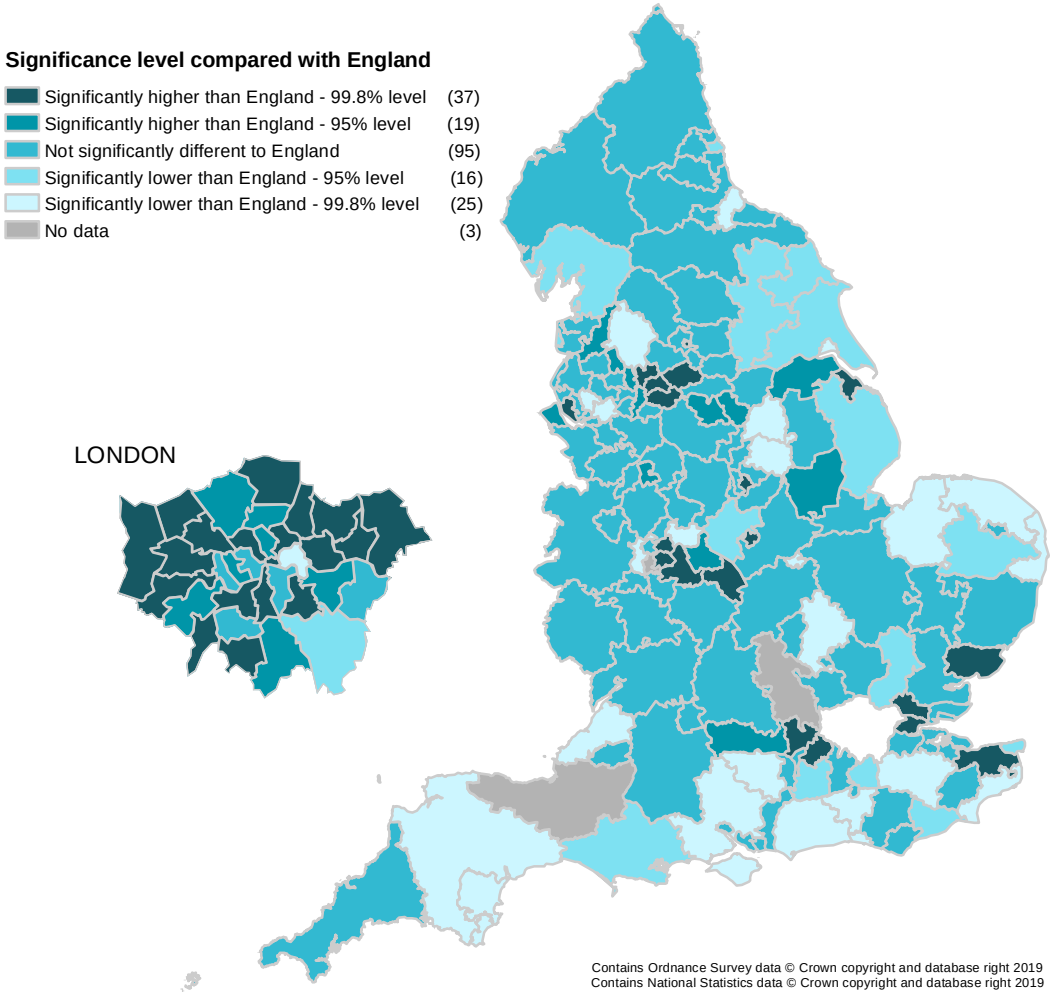


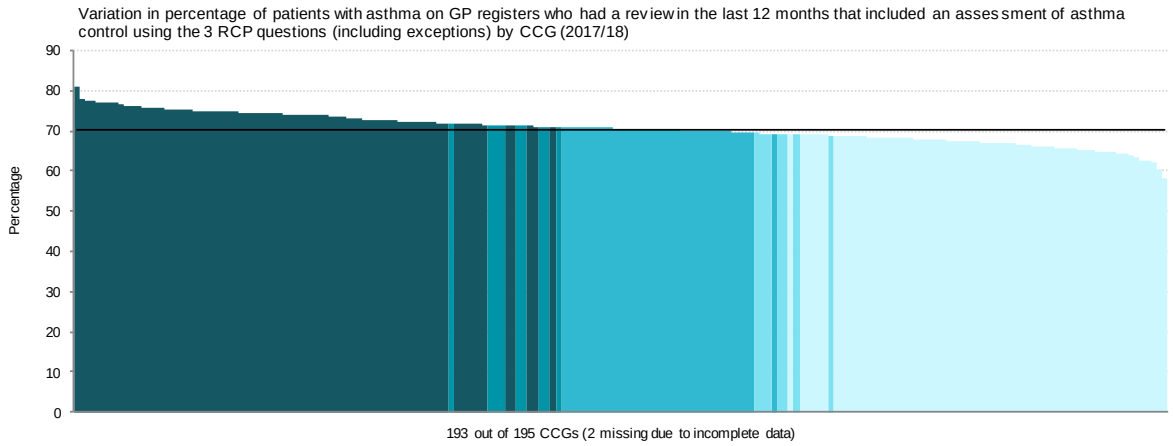
Asthma – Primary care - Review

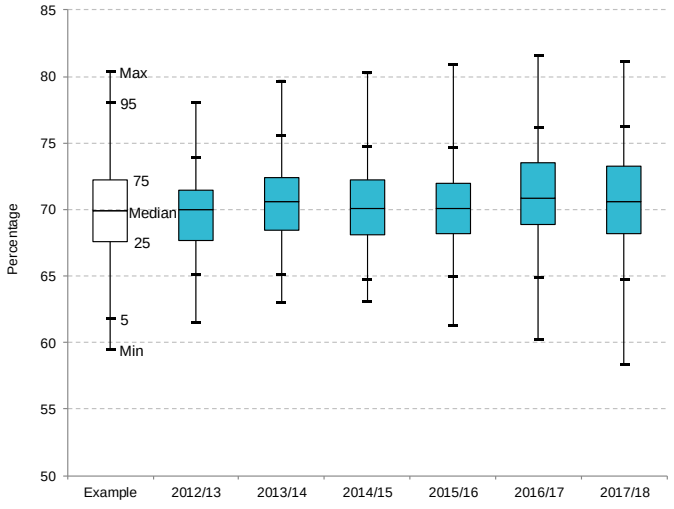
Map 14b: Variation in percentage of patients with asthma on GP registers aged 14 to 19 years, in whom there is a record of smoking status in the preceding 12 months (including exceptions) by CCG (2017/18)

Optimum Value: High









Max-Min (Range)		16.5	16.7	17.2	19.6	21.3	22.8	WIDENING Significant
95th-5th percentile		8.7	10.4	10.0	9.7	11.3	11.5	WIDENING Significant
75th-25th percentile		3.8	3.9	4.2	3.8	4.7	5.1	WIDENING Significant
Median		70.0	70.6	70.0	70.1	70.9	70.6	No significant change

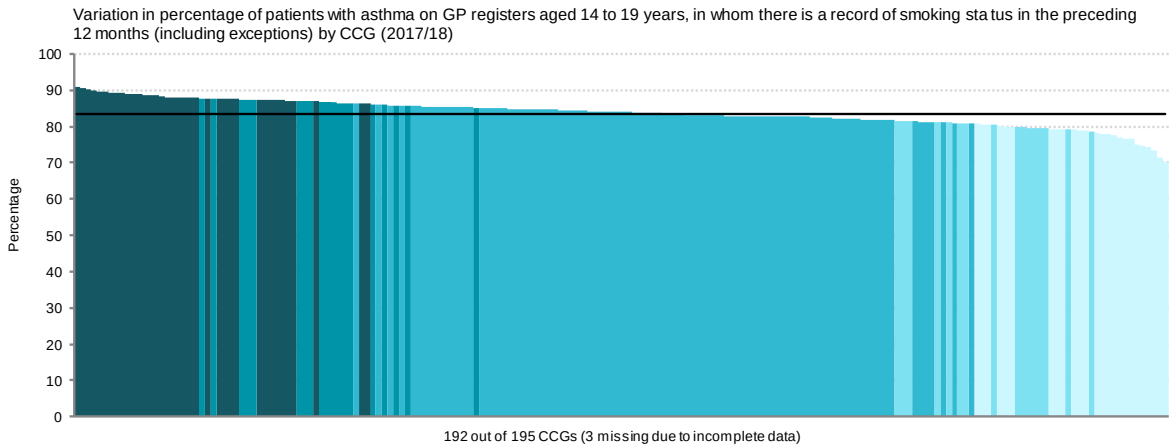
Context

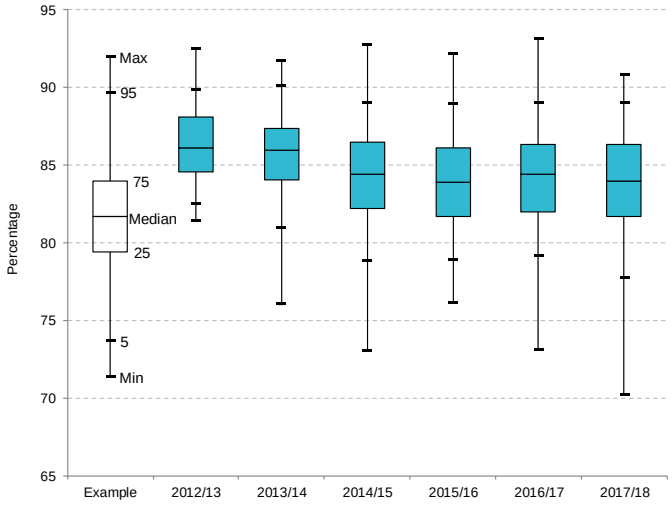
The severity of asthma varies, but it is recommended by many guidance documents (BTS/SIGN and NICE) that people with asthma should receive regular clinical reviews to ensure their symptoms are controlled and thereby minimise disruption to daily life. In England, up to one-fifth of people with asthma do not receive an annual clinical review.[1]

Pro-active structured care has benefits for patients with asthma. Important elements of structured asthma management are checking symptom levels, peak flow measurements, inhaler technique, and adherence to current treatment, in addition to supporting patients in the understanding of their condition such that they can self-manage. A recent development in chronic asthma care has been to support people with asthma to devise a personalised treatment plan. This should include pharmacological management and what to do if having an asthma attack.

When considering pharmacological treatment, clinicians should also consider the impact of inhalers on the environment: despite having a similar clinical effect, metered dose inhalers (MDIs) have been found to be a source of dangerous greenhouse gases, whereas dry powder inhalers have no similar known polluting effect. NICE have recently published a patient decision aid that will enable patients with asthma to identify which inhalers meet their needs and where several inhalers are a viable option, patients can opt for the most environmentally friendly option.

If MDIs are prescribed; Salbutamol has a larger propellant volume than similar MDIs and patients should return used MDIs to a pharmacy for climate safe disposal.





Max-Min (Range)		11.1	15.7	19.8	16.1	20.0	20.6	WIDENING Significant
95th-5th percentile		7.4	9.2	10.2	10.0	9.9	11.3	WIDENING Significant
75th-25th percentile		3.5	3.3	4.3	4.4	4.4	4.6	WIDENING Significant
Median		86.1	86.0	84.4	83.9	84.4	84.0	DECREASING Significant

One factor which can affect patients' symptoms of asthma is smoking. It is recognised that smoking (both active and passive) can lead to uncontrolled asthma.

Uptake of smoking in teenagers has been shown to increase the risk of both developing asthma, and this persisting into adulthood. Smoking can also decrease the effectiveness of certain treatments, and so it is important to record the smoking status of patients, particularly younger people. It also provides an opportunity to treat tobacco addiction and support patients to stop smoking. Across England the percentage of patients aged 14 to 19 with asthma on the asthma register who had their smoking status recorded in the past 12 months was 83.5%, 183,867 patients.[2]

Magnitude of variation

Map 14a: Variation in percentage of patients with asthma on GP registers who had a review in the last 12 months that included an assessment of asthma control using the 3 RCP questions (including exceptions) by CCG (2017/18)

The maps and column chart display the latest period (2017/18), during which CCG values ranged from 58.3% to 81.1%, which is a 1.4-fold difference between CCGs. The England value for 2017/18 was 70.2%.

The box plot shows the distribution of CCG values for the period 2012/13 to 2017/18.There has been significant widening of all 3 measures of variation.

Map 14b: Variation in percentage of patients with asthma on GP registers aged 14 to 19 years, in whom there is a record of smoking status in the preceding 12 months (including exceptions) by CCG (2017/18)

The maps and column chart display the latest period (2017/18), during which CCG values ranged from 70.3% to 90.9%, which is a 1.3-fold difference between CCGs. The England value for 2017/18 was 83.5%. The box plot shows the distribution of CCG values for the period 2012/13 to 2017/18. There has been significant widening of all 3 measures of variation. The median decreased significantly from 86.1% in 2012/13 to 84.0% in 2017/18.

The differences in exception-reporting suggest that some practices are more thorough than others at recording information on patient attendance or rationale for treatment decisions. However, it can reflect the effectiveness of the practice in reaching the local asthma population and thereby at influencing patient outcomes. The high levels of variation suggest that many people with asthma are not on GP registers and are therefore at greater risk of not receiving the appropriate assessment and treatment. There may also be some variation in how smoking status is recorded by practices to meet the QOF requirements. The QOF business rules require practices to use Read codes to record their actions. This means practices can meet the QOF measure without health care practitioners speaking face to face with patients about their smoking habits.

Options for action

Patients who are not reviewed or who are exempted from review are unlikely to receive pro-active chronic disease management and are more likely to have poorer outcomes than patients who are reviewed. It is possible that people not attending for regular review are among the high-risk patients in whom control is poor. Novel and creative strategies may be needed to reach these patients in order:

- to optimise their asthma control
- to reduce the risk of exacerbation, emergency admission and death
- to increase local population coverage of chronic disease management in asthma, commissioners could consider the interventions in Box 14.1 and help more local practices to become effective at reaching the entire local population with asthma through regular review

Box 14.1: Increasing local population coverage of chronic disease management in asthma

- calculate the actual chronic disease management coverage of registered asthma patients by including excepted patients in the denominator
- benchmark and share local exception-reporting data
- identify the systems used by the best-performing practices to maximise patient-reach
- support local practices with high exception rates to implement best-practice systems and improve patient outcomes through systematic chronic disease management

Resources

British Thoracic Society (BTS) and Scottish Intercollegiate Guidelines Network (SIGN) (2019) British guideline on the management of asthma. A national clinical guideline [Accessed 2 August 2019]

Department of Health (2011) An outcomes strategy for people with chronic obstructive pulmonary disease (COPD) and Asthma in England [Accessed 30 January 2019]

Department of Health (2012) An Outcomes Strategy for COPD and Asthma: NHS Companion Document [Accessed 30 January 2019]

National Institute for Clinical Excellence (2019) Inhalers for asthma (patient decision aid) [Accessed 06 May 2019]

[1] Asthma UK Annual Asthma Survey 2018 [Accessed 10 June 2019]

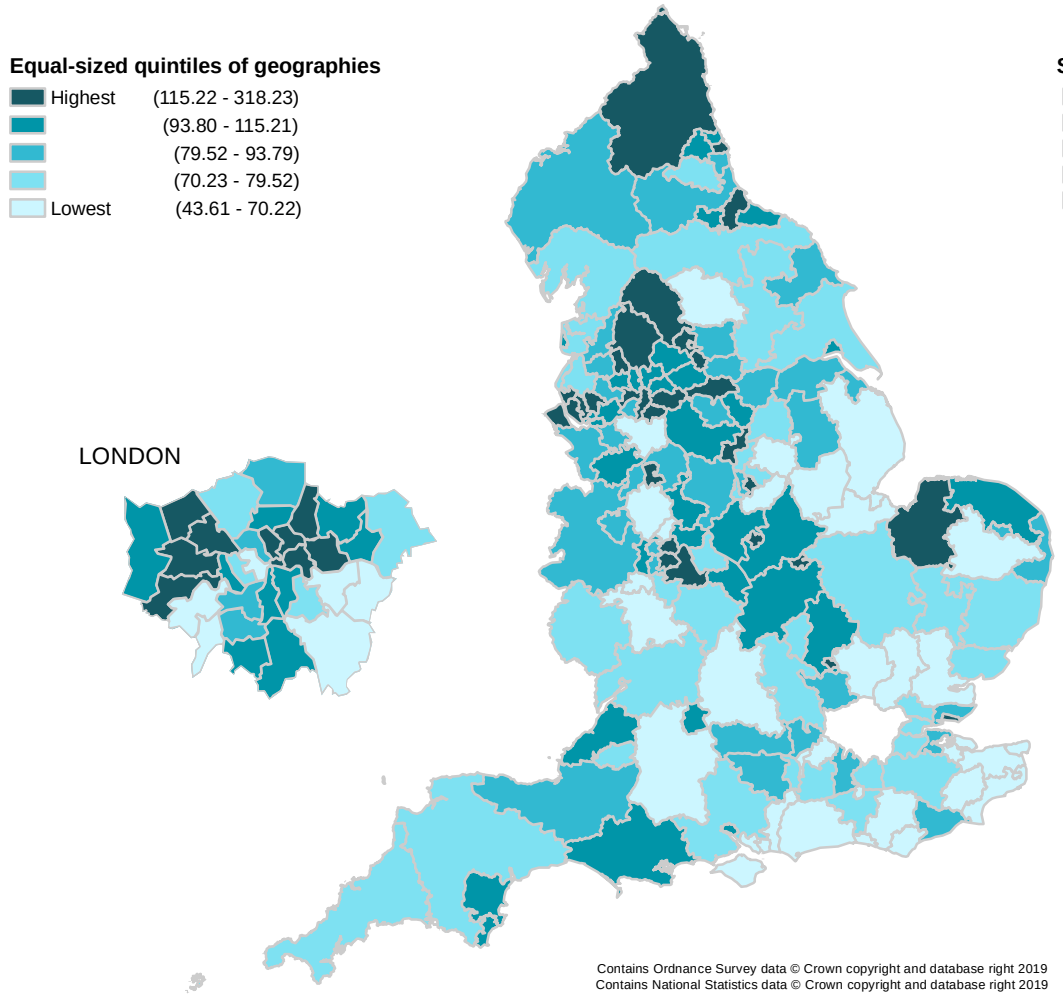
[2] NHS Digital (2018) Quality and Outcomes Framework, Achievement, prevalence and exceptions data - 2017-18 [PAS] [Accessed 6 May 2019]

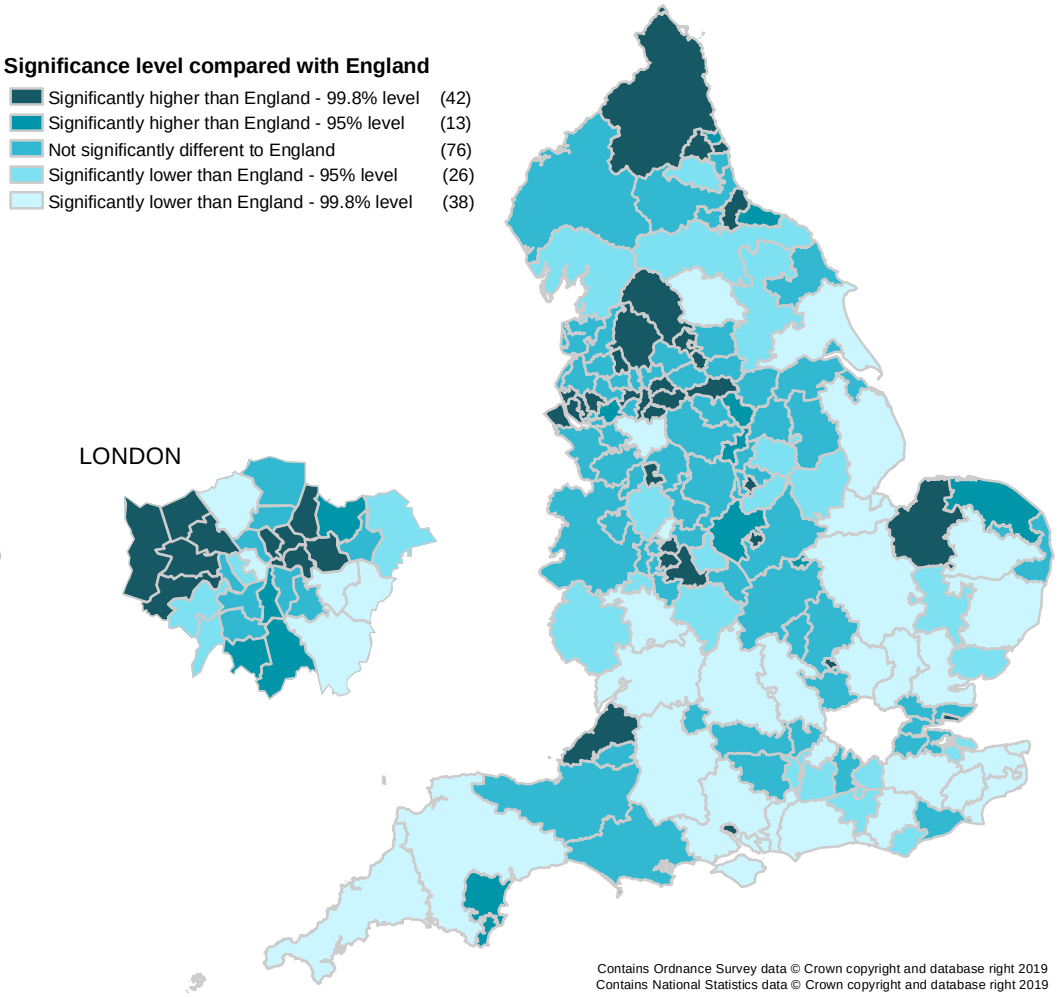
Asthma – Adult hospital admissions

Map 15a: Variation in rate of emergency admissions to hospital for asthma in adults aged 19 years and over per population by CCG (2017/18)

Directly standardised rate per 100,000

Optimum value: Low

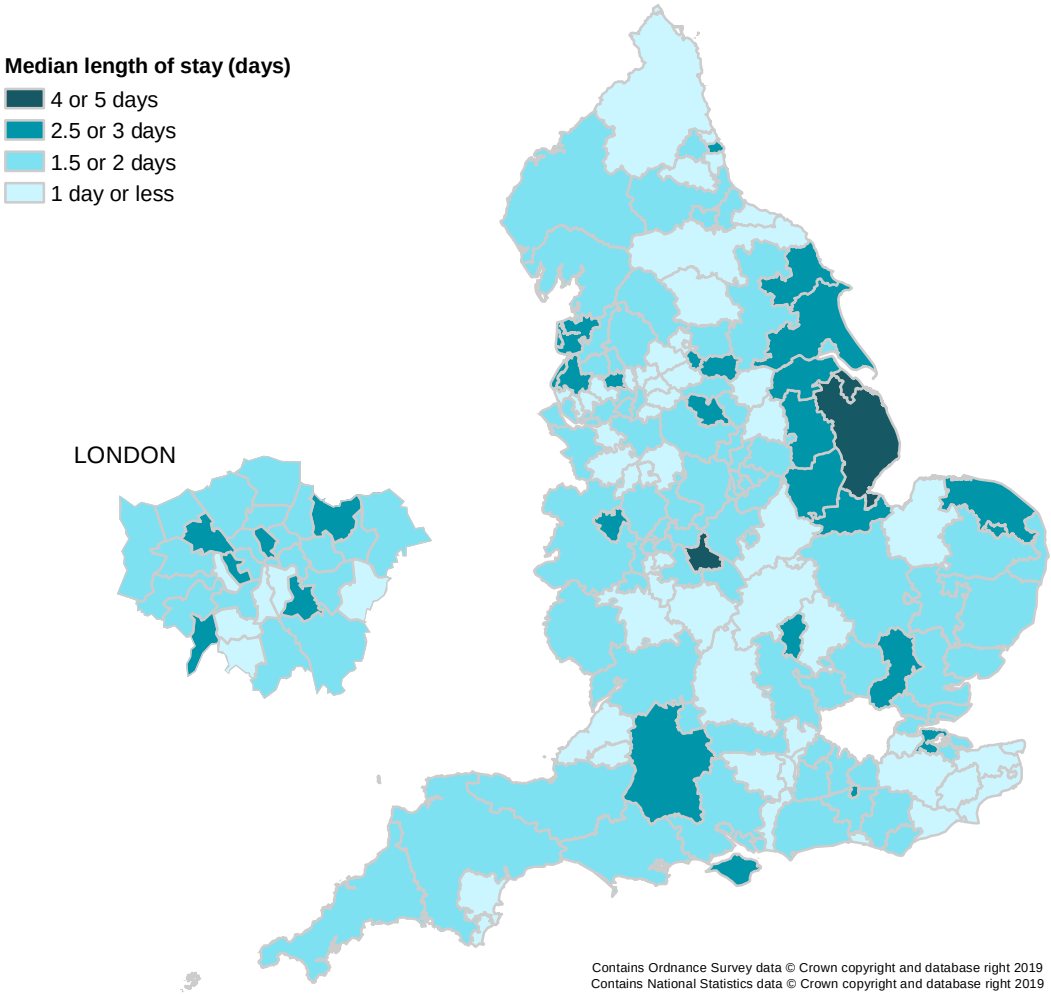




Asthma – Adult hospital admissions

Map 15b: Variation in median length of stay (days) of emergency admissions to hospital for asthma in adults aged 19 years and over by CCG (2017/18)

Optimum value: Local interpretation

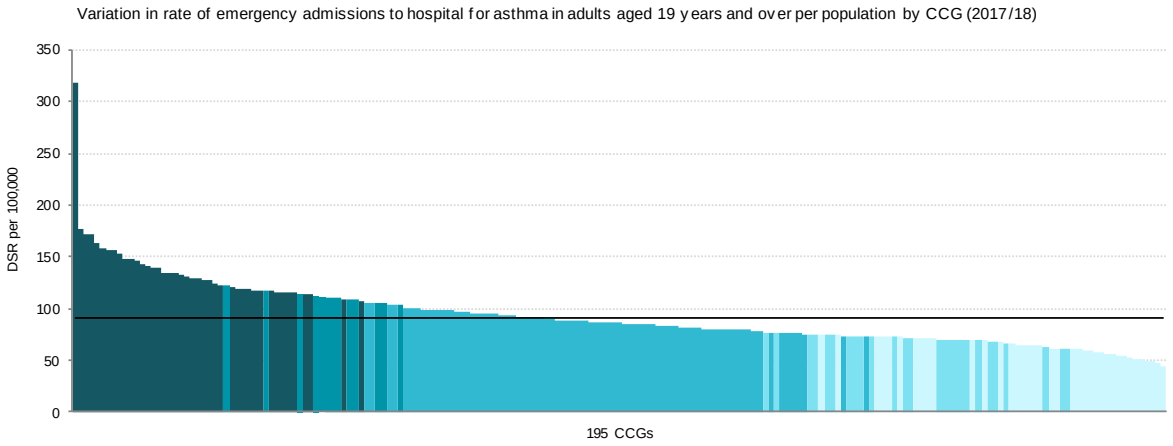


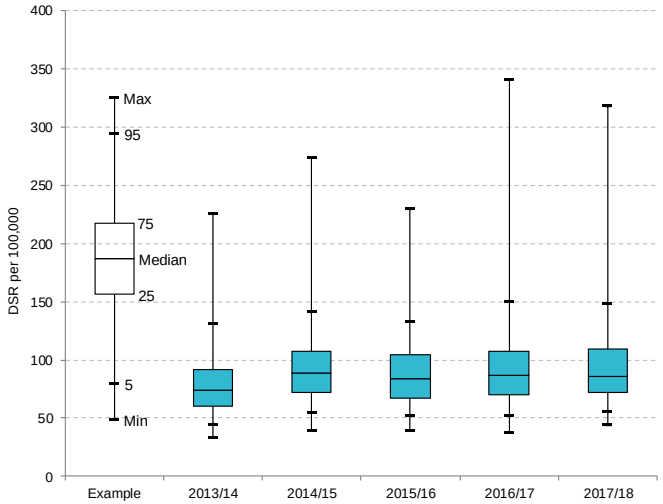
Context

With optimal treatment, good asthma control should be achievable in the majority of patients. This is echoed in national guidelines for the management of asthma,[1] which state that:

- people with asthma should be offered self-management education, a written personalised asthma action plan (PAAP) and support by regular professional review
- non-pharmaceutical management may be beneficial including avoidance of asthma triggers such as occupational exposure
- people with asthma should expect their condition to be adequately controlled by their medicine
- they should expect to be free from symptoms and restrictions on their lives
- they should not need emergency treatment if appropriate routine care is given

In the guidelines, control is described as a person having no asthma attacks, no emergency visits to doctors or hospitals, minimal or no asthma symptoms and no restrictions on their daily activities. Despite the availability of effective





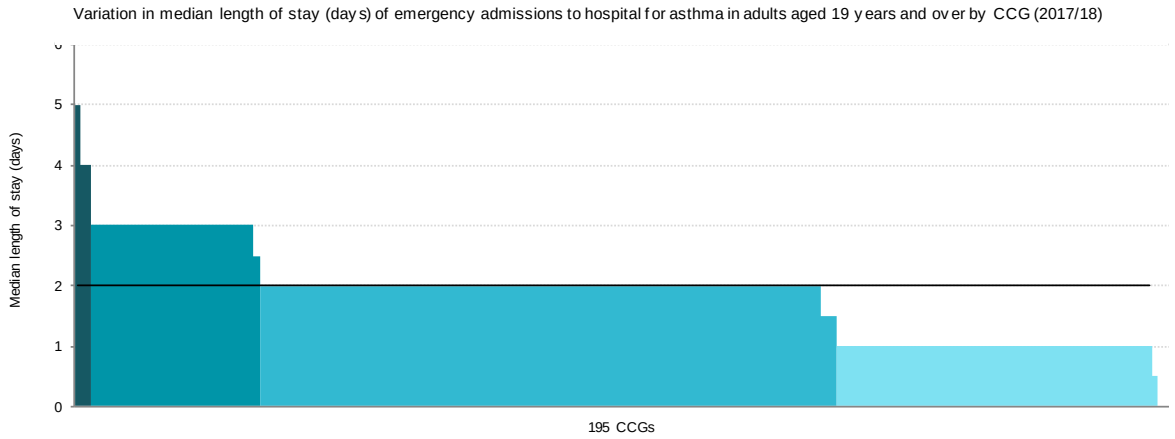
Max-Min (Range)		192.0	235.1	190.5	303.0	274.6	No significant change
95th-5th percentile		88.1	87.0	81.1	97.7	92.1	No significant change
75th-25th percentile		31.5	35.9	37.2	37.8	36.7	No significant change
Median		74.3	88.3	84.3	87.0	85.9	No significant change

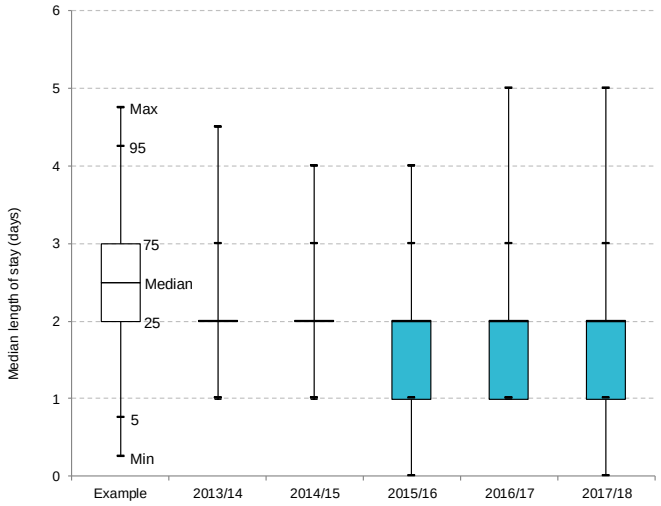
treatments, many people in England still have exacerbations or asthma that is not controlled according to the above definition.

For many patients, asthma control is sub-optimal and an emergency hospital attendance or admission represents a serious loss of control of a person's asthma which is potentially avoidable.

Many people with asthma attend accident and emergency departments without requiring admission. Emergency admission to hospital is a major adverse outcome for patients. It is estimated around three-quarters of admissions could be prevented with improved long-term management. Most people with asthma may have had symptoms for several days before an admission.[2] Structured self-management support, including a personalised asthma action plan (PAAP) and patient education, is a key element of long-term disease management in asthma. People who have a PAAP have fewer hospitalisations, fewer emergency department visits, and fewer unscheduled visits to the doctor than people who do not have such a plan.[3] Personalised care planning with appropriate follow-up support can lead to improvements in some indicators of physical, psychological and subjective health status, and people's capability to self-manage their condition.[4]

Recommendations of the National Review of Asthma Deaths[5] into asthma deaths were that all patients using more than 12 rescue inhalers in 12 months should have their asthma treatment reviewed.





		2013/14	2014/15	2015/16	2016/17	2017/18	
Max-Min (Range)		3.5	3.0	4.0	4.0	5.0	No significant change
95th-5th percentile		2.0	2.0	2.0	2.0	2.0	No significant change
75th-25th percentile		0.0	0.0	1.0	1.0	1.0	No significant change
Median		2.0	2.0	2.0	2.0	2.0	No significant change

In addition, patients with asthma must be referred to a specialist asthma service if they have required more than 2 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.

Follow-up arrangements must also be made after every attendance at an emergency department or out-of-hours service for an asthma attack. Secondary care follow-up should be arranged after every hospital admission for asthma, and for patients who have attended the emergency department 2 or more times with an asthma attack in the previous 12 months.

If these sensible and proportionate recommendations were to be systematically implemented evidence in the literature suggests that this should lead to fewer failures in care which result in hospital admission.

Magnitude of variation

Map 15a: Variation in rate of emergency admissions to hospital for asthma in adults aged 19 years and over per population by CCG (2017/18)

The maps and column chart display the latest period (2017/18), during which CCG values ranged from 43.6 to 318.2 per 100,000 population, which is a 7.3-fold difference between CCGs. The England value for 2017/18 was 90.4 per 100,000 population.

The box plot shows the distribution of CCG values for the period 2013/14 to 2017/18. There was no significant change in any of the 3 variation measures between 2013/14 and 2017/18.

Map 15b: Variation in median length of stay (days) of emergency admissions to hospital for asthma in adults aged 19 years and over by CCG (2017/18)

The map and column chart display the latest period (2017/18), during which CCG values ranged from 0.0 to 5.0 days. The England value for 2017/18 was 2 days.

The box plot shows the distribution of CCG values for the period 2013/14 to 2017/18. There was no significant change in any of the 3 variation measures between 2013/14 and 2017/18.

Some of this variation can be accounted for by differences in local population characteristics, but much is unwarranted due to differences in:

- the quality of asthma care
- the support people receive from primary care to manage their condition

The degree of variation observed shows that in many localities there is substantial scope for reducing emergency events. What is achievable for patients in one locality should be possible in all localities if best practice is consistently adopted in the NHS.

Options for action

Action to prevent emergency admissions will save money and improve outcomes for people with asthma: caring for people who experience an asthma attack costs 3.5 times more than for those whose asthma is well managed.[6] Commissioners need to specify that service providers deliver optimal long term disease management and structured support for self-management such that patients know the appropriate action to take at the first sign of deterioration, including:

- developing a personalised asthma action plan in partnership with patients, as part of structured asthma education to help all patients identify deterioration and understand what actions to take
- reviewing asthma action plans regularly and always at the time of emergency department attendance or hospital admission
- delivering care in line with the BTS/SIGN guideline and NICE Guidance (see ‘Resources’)
- providing healthcare professionals responsible for managing people with asthma with training in asthma management, and with support on how best to deliver structured self-management support to patients
- providing a structured primary care review at least once a year to all people with asthma in line with the BTS/SIGN guideline
- conducting a review of all people attending hospital with acute exacerbations of asthma, preferably within 30 days of attendance – to be undertaken by a clinician with expertise in asthma management in line with guidance
- helping practices identify people who need more active monitoring and management and develop a register of people at risk of admission. Risk factors include a hospital admission in the previous 12 months, using excessive quantities of short acting bronchodilators, and requiring a course of oral steroids in the preceding 12 months
- all secondary care centres to participate in the National Asthma Audit to systematically measure quality of care and identify processes for improvement

Service providers could consider the introduction in the urgent-care system of a triage service run by a multidisciplinary respiratory team to manage the diversion of people with asthma to community services using direct links between the triage service and the “pick-up” of patients in the community.[7]

Resources

Asthma UK (2018) Annual Asthma Survey 2018 [Accessed 19 July 2019]

British Lung Foundation Asthma Statistics [Accessed 29 January 2019]

British Thoracic Society (BTS) and Scottish Intercollegiate Guidelines Network (SIGN) (2019) British guideline on the

management of asthma. A national clinical guideline [Accessed 2 August 2019]

Department of Health (2011) An Outcomes Strategy for Chronic Obstructive Pulmonary Disease COPD and Asthma in England [Accessed 30 January 2019]

Department of Health (2012) An Outcomes Strategy for COPD and Asthma: NHS Companion Document [Accessed 29 January 2019]

NHS Improvement Improving adult asthma care: Emerging learning from the national improvement projects [Accessed 17 July 2019]

NHS Yorkshire and the Humber Asthma: Better for Less [Accessed 22 January 2019]

National Institute for Health and Care Excellence (2018) Asthma (NICE quality standard [QS25]) [Accessed 15 July 2019]

National Institute for Health and Care Excellence (2017) Asthma: diagnosis, monitoring and chronic asthma management (NICE guideline [NG80]) [Accessed 17 July 2019]

Royal College of Physicians (2014) National Review of Asthma Deaths – why asthma still kills. [Accessed 2 August 2019]

Scott S (2017) British Thoracic Society Adult Asthma Audit 2016 (Audit Period: 1 September – 31 October 2016) [Accessed 2 August 2019]

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[1] National Institute for Health and Care Excellence (2017) Asthma: diagnosis, monitoring and chronic asthma management. NICE guideline [NG80] [Accessed 29 July 2019]
[2] Asthma UK (2014) Time to take action on asthma – Compare your care 2014 [Accessed 29 January 2019]
[3] Gibson P, Powell H, Wilson A and others (2002) Self-management education and regular practitioner review for adults with asthma Cochrane Database of Systematic Reviews (3):CD001117 doi: 10.1002/14651858.CD001117 [Accessed 2 August 2019]
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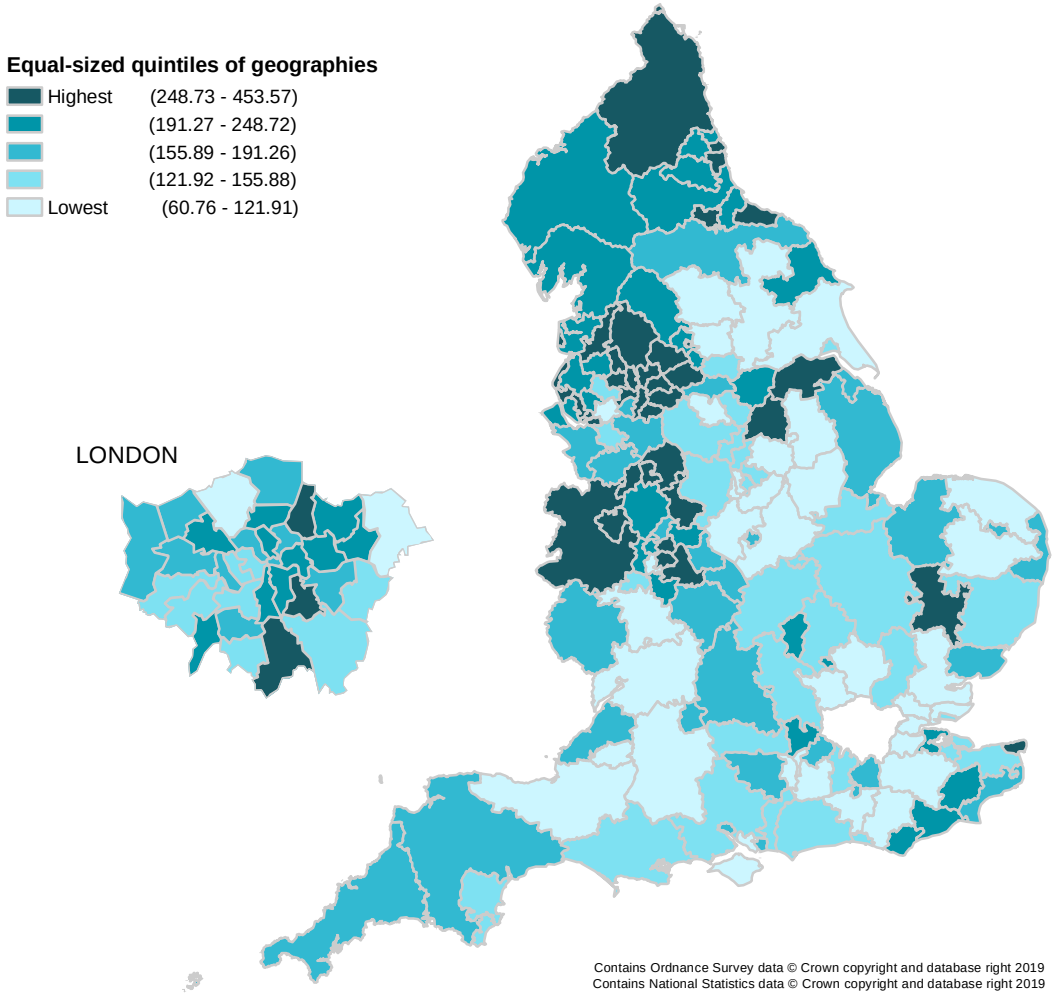
[5] Royal College of Physicians (2014) National Review of Asthma Deaths – why asthma still kills [Accessed 25 July 2019]
[6] Bahadori K, Doyle-Waters M, Marra, C and others (2009) Economic burden of asthma: a systematic review BMC Pulmonary Medicine 9(24) doi: 10.1186/1471-2466-9-24 [Accessed 2 August 2019]
[7] McKay C, Cripps M (2013) Delivering improved healthcare in Warrington: the NHS Right Care approach [Accessed 5 March 2019]

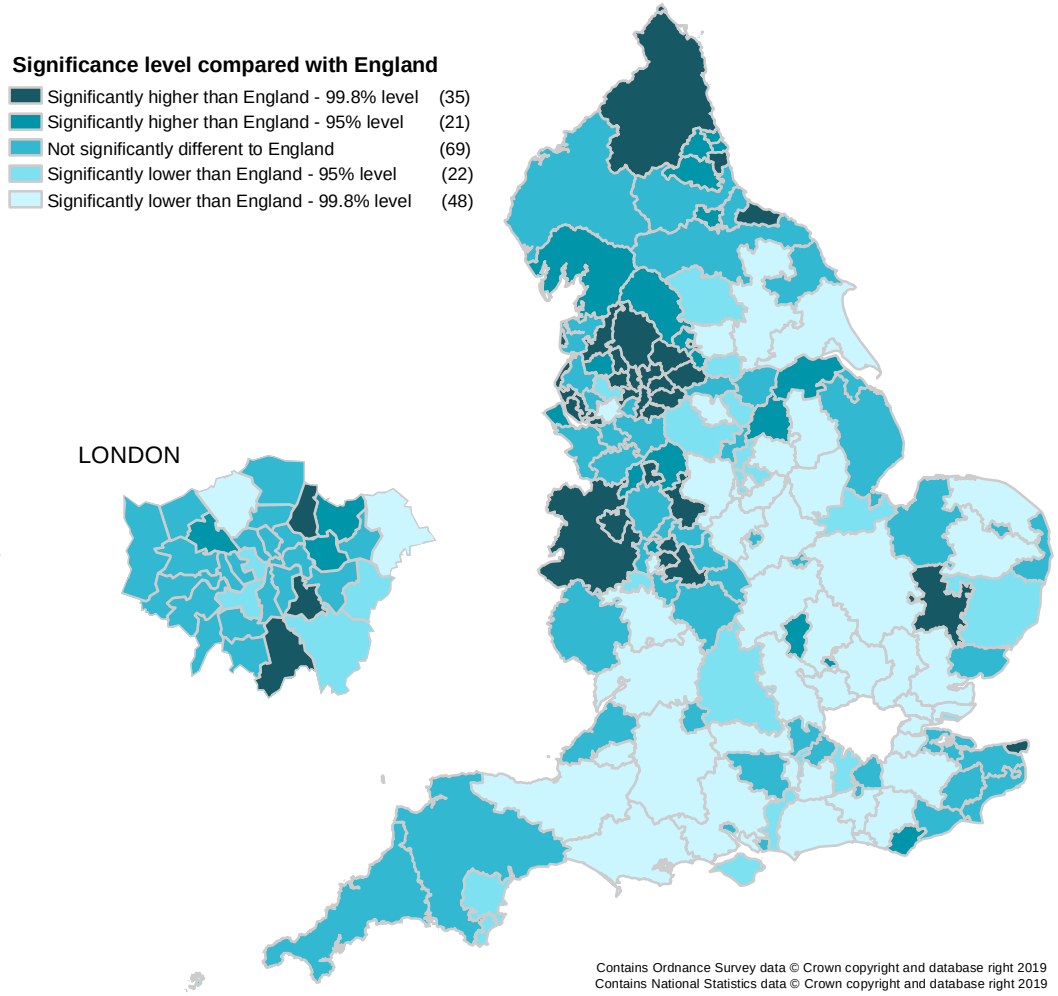
Asthma – Paediatric hospital admissions

Map 16a: Variation in rate of emergency admissions to hospital for asthma in children aged 0-18 years per population by CCG (2017/18)

Crude rate per 100,000 population

Optimum value: Low

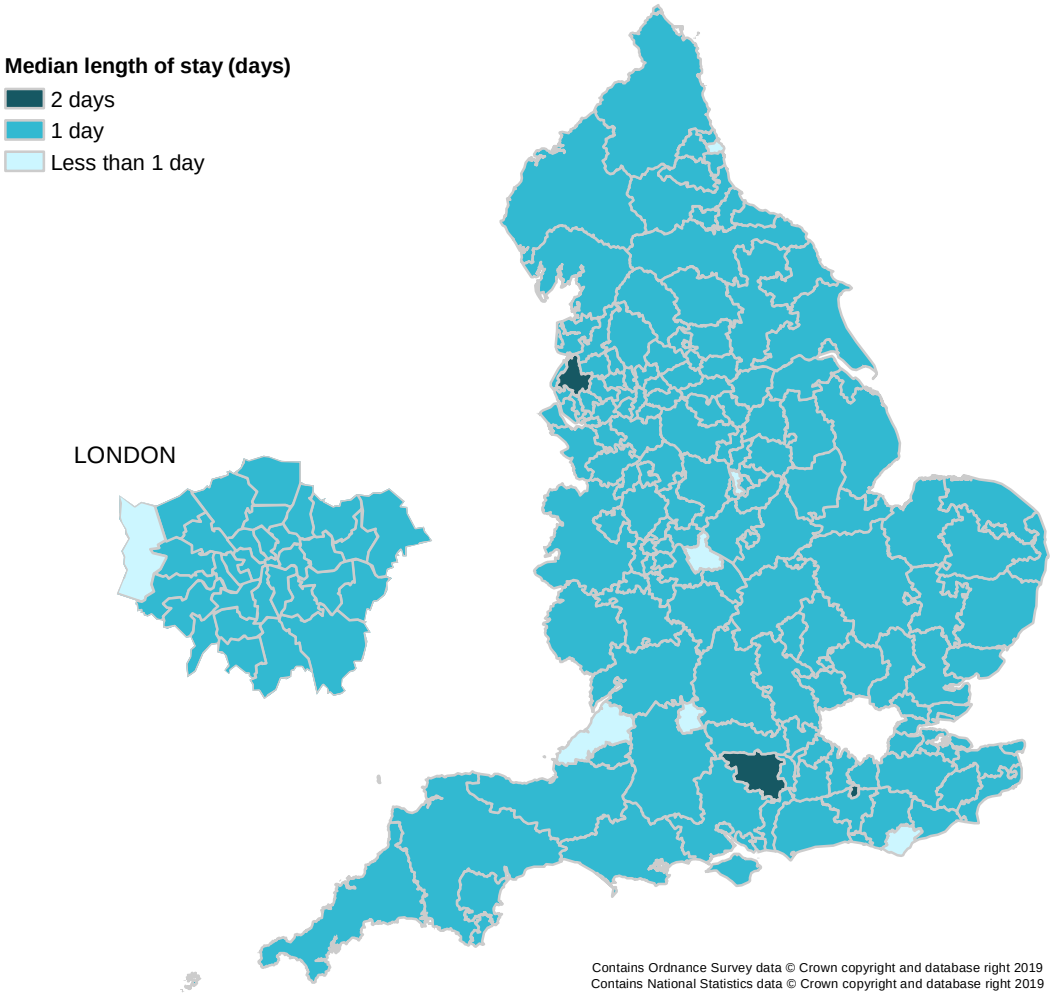




Asthma – Paediatric hospital admissions

Map 16b: Variation in median length of stay (days) of emergency admissions to hospital for asthma in children aged 0-18 years by CCG (2017/18)

Optimum value: Requires local interpretation



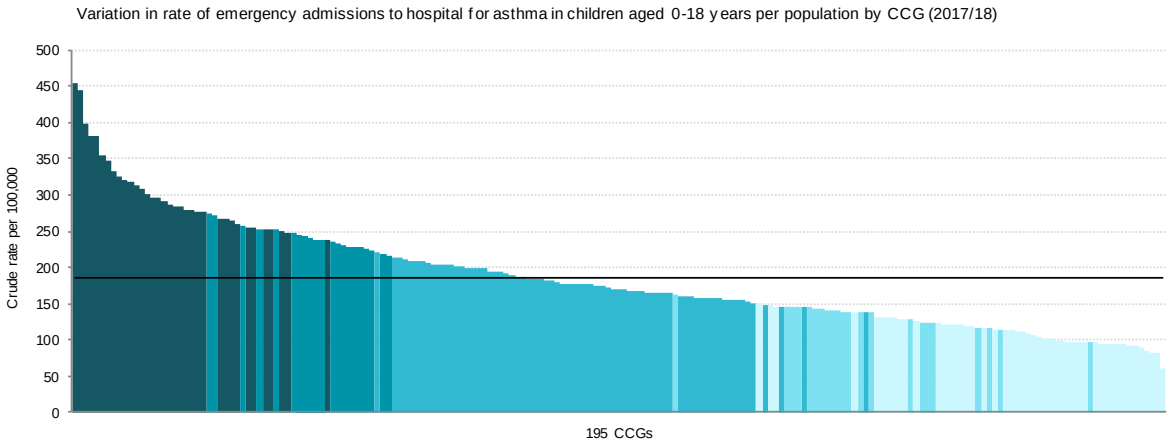
Context

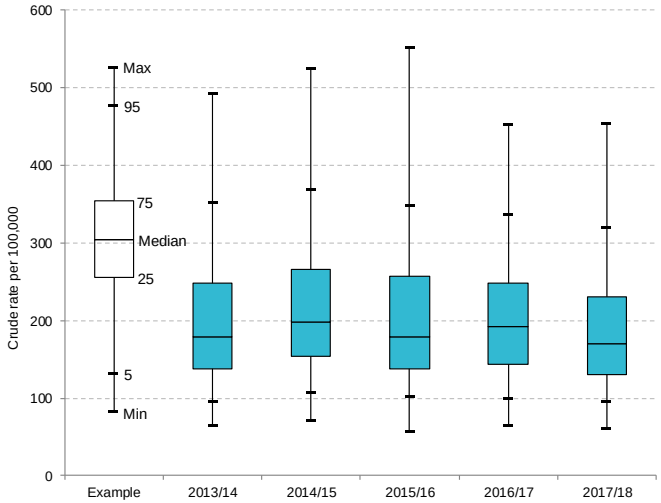
Asthma is the commonest long-term medical condition in childhood. Of the 5.4 million people in the UK currently being treated for asthma, 1.1 million are children (20%).[1]

Many children with asthma have poor control, often a consequence of poor medication compliance or poor inhaler technique. Environmental factors, such as exposure to second-hand smoke, air pollution and housing quality, also impact on control. Asthma is the most common reason for urgent hospital admissions in children and young people,[2] the analysis for this atlas shows 64 children admitted to hospital every day because of their asthma. This results in a significant number of school absences.[3]

Emergency admissions should be avoided whenever possible. Interventions that improve health outcomes for people with asthma include:

- self-management education that incorporates written personalised asthma actions plans (PAAPs)
- regular pro-active structured clinical reviews in primary care, including discussion and use of a written PAAP, and checking inhaler technique





Max-Min (Range)		427.3	454.3	493.9	388.5	392.8	No significant change
95th-5th percentile		255.5	260.7	246.7	238.5	224.8	NARROWING Significant
75th-25th percentile		111.1	111.8	120.2	105.8	99.3	No significant change
Median		179.0	198.0	179.1	192.1	170.3	No significant change

- education for clinicians
- improving environmental factors within the home, such as smoking outside

The National Review of Asthma Deaths (NRAD) found preventable factors were present in 90% of childhood deaths from asthma.[4] NHS England state that less than 25% of children with asthma have a PAAP.[2]

Unplanned hospitalisation for asthma, diabetes and epilepsy in children and young people aged under 19 years is a national quality indicator in the NHS Outcomes Framework 2019.[5]

Magnitude of variation

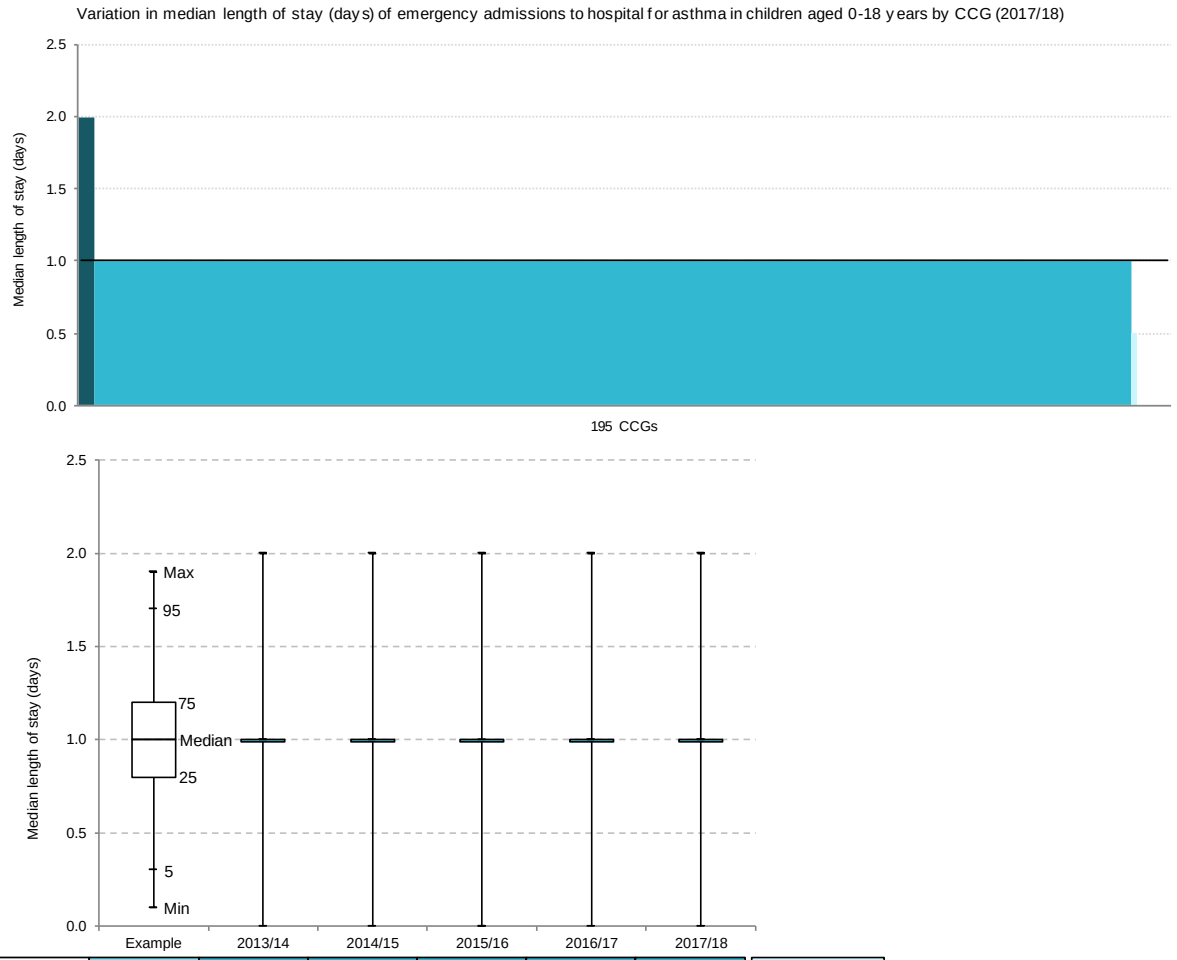
Map 16a: Variation in rate of emergency admissions to hospital for asthma in children aged 0-18 years per population by CCG (2017/18)

The maps and column chart display the latest period (2017/18), during which CCG values ranged from 60.8 to 453.6 per 100,000 population, which is a 7.5-fold difference between CCGs. The England value for 2017/18 was 184.8 per 100,000 population.

The box plot shows the distribution of CCG values for the period 2013/14 to 2017/18. The 95th to 5th percentile gap narrowed significantly.

Map 16b: Variation in median length of stay (days) of emergency admissions to hospital for asthma in children aged 0-18 years by CCG (2017/18)

The map and column chart display the latest period (2017/18), during which CCG values ranged from 0 to 2 days. The England value for 2017/18 was 1 day.



		2013/14	2014/15	2015/16	2016/17	2017/18	
Max-Min (Range)		2.0	2.0	2.0	2.0	2.0	No significant change
95th-5th percentile		0.0	0.0	1.0	0.0	0.0	No significant change
75th-25th percentile		0.0	0.0	0.0	0.0	0.0	No significant change
Median		1.0	1.0	1.0	1.0	1.0	No significant change

The box plot shows the distribution of CCG values for the period 2013/14 to 2017/18. There was no significant change in any of the 3 variation measures between 2013/14 and 2017/18.

The degree of variation observed in the rate of emergency admission may be due to:

- suboptimal symptom management and secondary prevention in the community
- suboptimal emergency care in the accident and emergency (A&E) department
- differences in admission criteria among paediatric units
- suboptimal inhaler technique and compliance with treatment

Bed capacity could be a factor in determining admission criteria.

When compared with previous financial years, it shows that the variation observed for emergency admission rates for children with asthma is relatively high and of a similar degree. It would appear there is scope for greater equity in the provision of asthma services across England.

The degree of variation observed in length of stay in hospital may be related to disease severity. Geographically however, these data show no correlation between emergency admission rate and median length of stay, which would suggest there are other factors involved, such as differences in:

- inpatient management of asthma[6]
- discharge criteria for paediatric units

Bed capacity could also be a factor in determining discharge criteria.

Options for action

To identify unwarranted variation in the local management of long-term conditions such as asthma, commissioners can use the Disease Management Information Toolkit (DMIT).[7]

As the causes of asthma are multifactorial, action to reduce emergency admission requires a whole pathway approach, including public health, and primary and secondary care. Commissioners need to specify that all service providers use the BTS/SIGN guidance[8] as the basis of the clinical asthma pathways for which they are responsible locally and apply these consistently throughout services. Commissioners also need to implement the NICE quality standards for asthma (see Resources) that are relevant to children.

Hospital-based admission is an opportunity to review self-management skills. Service providers need to ensure that every child with asthma has a written PAAP according to the BTS/SIGN guideline on management of asthma, and the NICE quality standards for asthma; symptom-based plans are generally preferable for children. Also, every child admitted to hospital with an acute exacerbation of asthma has a structured review by a member of a specialist respiratory team before discharge, in accordance with the NICE quality standards for asthma.

Primary care service providers could audit the number and percentage of children with asthma receiving an annual review, and in particular those children who:

- over-use bronchodilators; or are on higher treatment steps
- have asthma attacks
- have complex needs
- belong to an at-risk ethnic minority group and who have attended emergency care

Commissioners need to ensure that service providers support clinicians:

- in implementing up-to-date evidence on best practice
- by providing training interventions especially for clinicians in primary care that include educational outreach visits

Commissioners may wish to consider establishing asthma diagnostic hubs to improve the feasibility of implementing BTS/SIGN guidelines consistently by Trusts and GPs participating in the National Asthma and COPD Audit Programme (NACAP).[9]

Any school-based asthma education programmes need to be targeted at the children's health professionals as well as the children themselves.

School nursing, primary care and paediatric asthma networks need to work together to optimise other vital aspects of the overall care of the child with asthma such as:

- parental education
- school medication management

Resources

British Thoracic Society (BTS) and Scottish Intercollegiate Guidelines Network (SIGN) (2019) British guideline on the management of asthma. A national clinical guideline [Accessed 2 August 2019]

NHS England Childhood asthma [Accessed 22 January 2019]

NHS Yorkshire and the Humber Asthma: Better for Less [Accessed 22 January 2019]

National Institute for Health and Care Excellence (Updated 2018) Asthma (NICE quality standard [QS25]) [Accessed 15 July 2019]

Public Health England (2015) Disease Management Information Toolkit (DMIT) [Accessed 20 June 2019]

Royal College of Physicians National Asthma and COPD Audit Programme (NACAP) [Accessed 20 June 2019]

[1] Asthma UK Asthma facts and statistics [Accessed 17 July 2019]
[2] NHS England Childhood Asthma [Accessed 2 August 2019]
[3] Mukherjee M, Stoddart A, Gupta R and others (2016) The epidemiology, healthcare and societal burden and costs of asthma in the UK and its member nations: analyses of standalone and linked national databases BMC Medicine 14:113 doi: 10.1186/s12916-016-0657-8 [Accessed 2 August 2019]
[4] Royal College of Physicians (2014) National Review of Asthma Deaths – why asthma still kills [Accessed 25 July 2019]
[5] NHS Digital (2019) NHS Outcomes Framework Indicators [Accessed 22 August 2019]
[6] Lyttle M, O'Sullivan R, Doull I, and others (2014) Variation in treatment of acute childhood wheeze in emergency departments of the United Kingdom and Ireland: an international survey of clinician practice Arch Dis Child 100:121–125. doi:10.1136/archdischild-2014-306591 [Accessed 20 June 2019]
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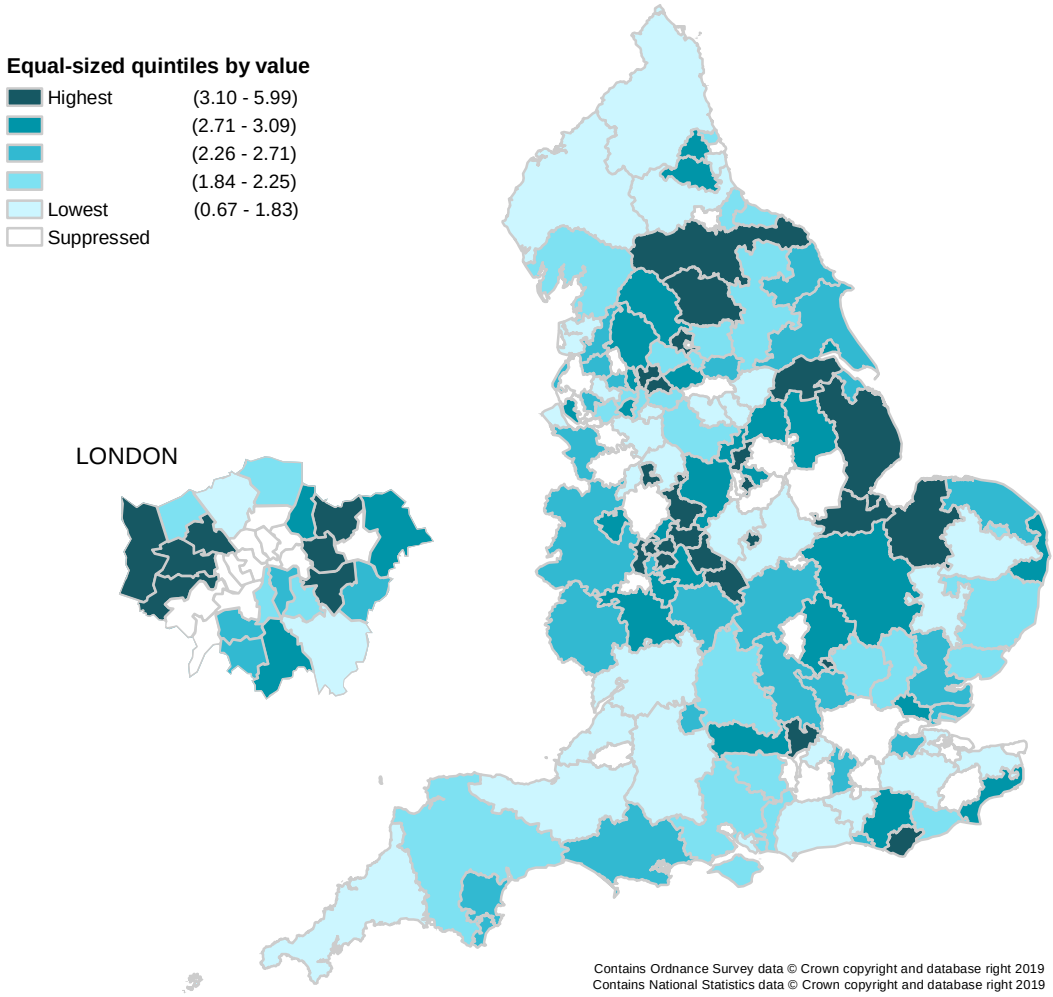
[8] British Thoracic Society and Scottish Intercollegiate Guidelines Network (2019) British guideline on the management of asthma. A national clinical guideline [Accessed 2 August 2019]
[9] Royal College of Physicians National Asthma and COPD Audit Programme (NACAP) [Accessed 20 June 2019]

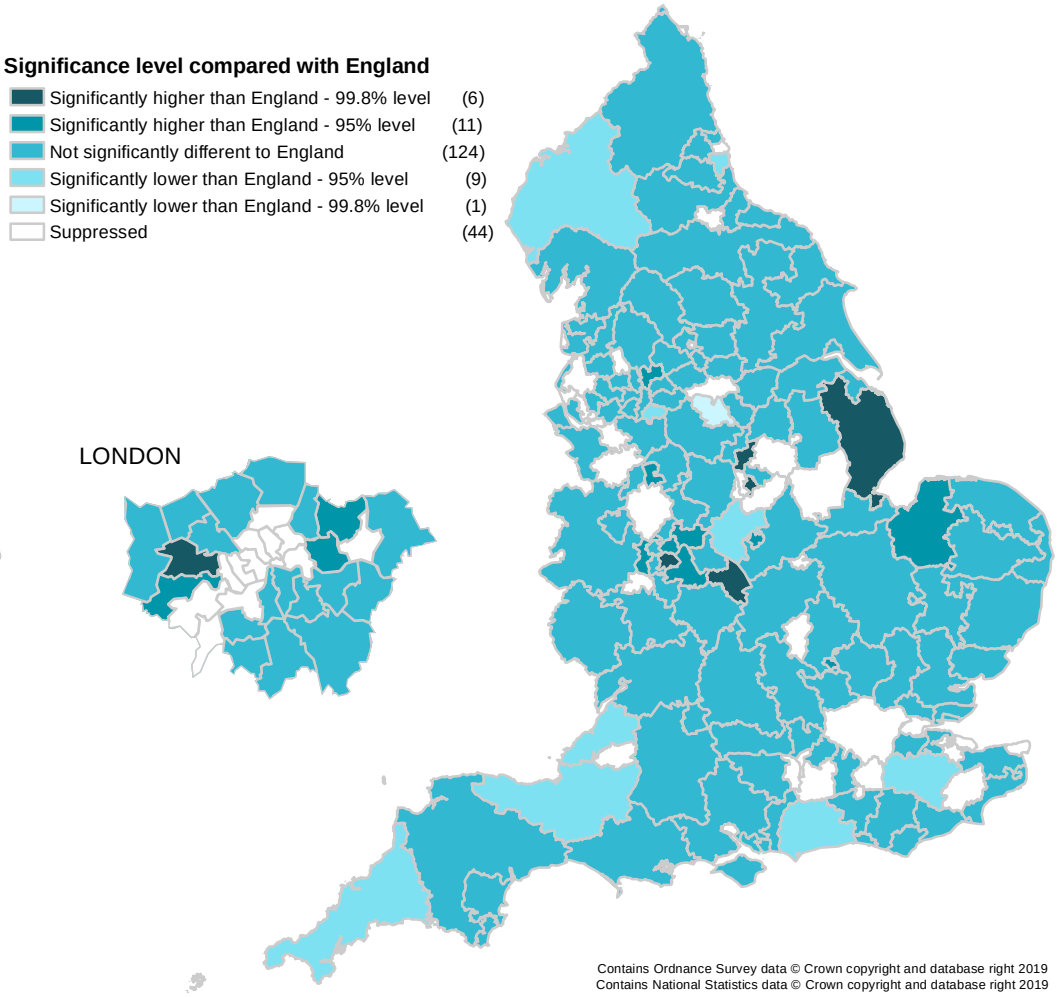
Asthma – Disease burden

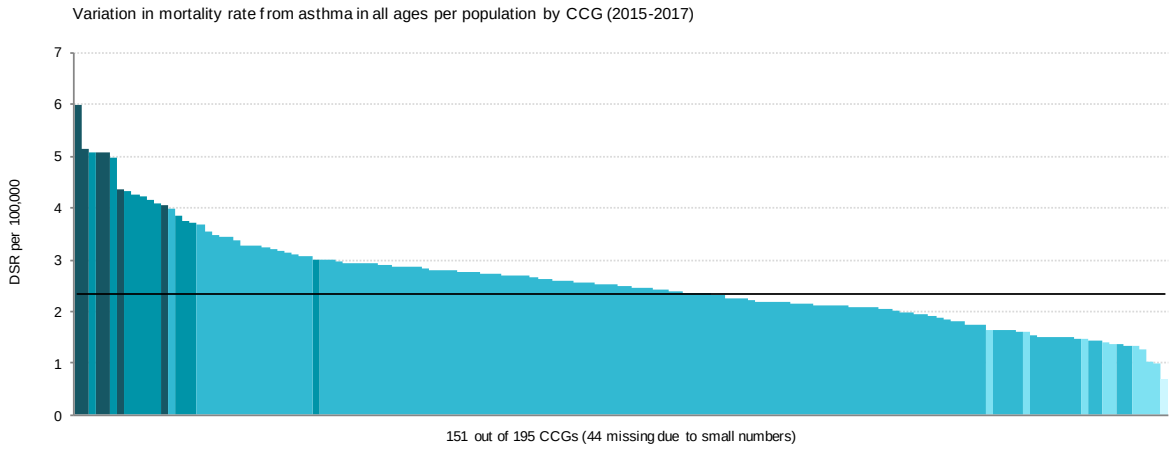
Map 17: Variation in mortality rate from asthma in all ages per population by CCG (2015-2017)

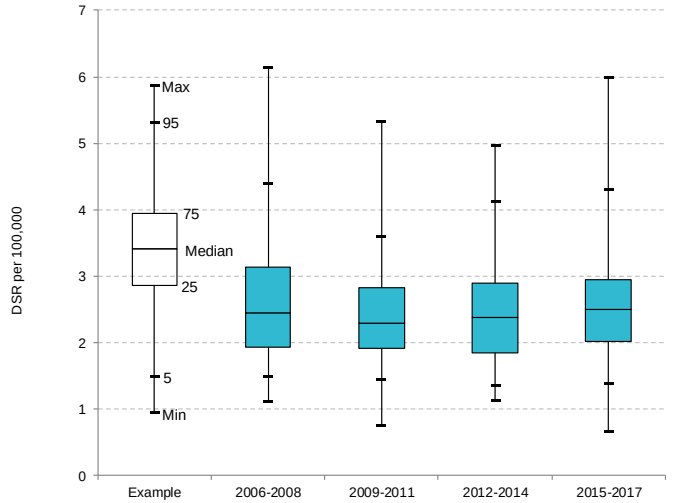
Directly standardised rate per 100,000

Optimum Value: Low









Max-Min (Range)		5.0	4.6	3.8	5.3	No significant change
95th-5th percentile		2.9	2.2	2.8	2.9	No significant change
75th-25th percentile		1.2	0.9	1.0	0.9	No significant change
Median		2.5	2.3	2.4	2.5	No significant change

Context

Every asthma death represents a failure of management of a reversible condition. Although advances in treatments, increased research and the development of evidence-based clinical guidelines have contributed to a reduction in deaths from asthma over the past 50 years, mortality rates within the UK are among the highest in Europe, and numbers have tended to increase over recent years (Figure 1) although deaths are falling in younger people.

Asthma is a complex disease, and it is not just those with severe asthma who die. The National Review of Asthma Deaths (NRAD) was the first national investigation of asthma deaths in the UK and examined data from a cohort for whom asthma was the cause of death between February 2012 and January 2013.[1] A number of recommendations were made in order to reduce the number of asthma deaths, but there is little evidence of a systematic approach nationally to the implementation of these recommendations. There are still a significant number of deaths from asthma every year.

Nationally, asthma mortality varies between sex and age groups. Mortality rates significantly increase with age and are higher in female patients.[1,2] The NRAD report suggests that in the majority of cases there were factors, which if addressed, would have reduced the risk of death.

Magnitude of variation

Map 17: Variation in mortality rate from asthma in all ages per population by CCG (2015-2017)

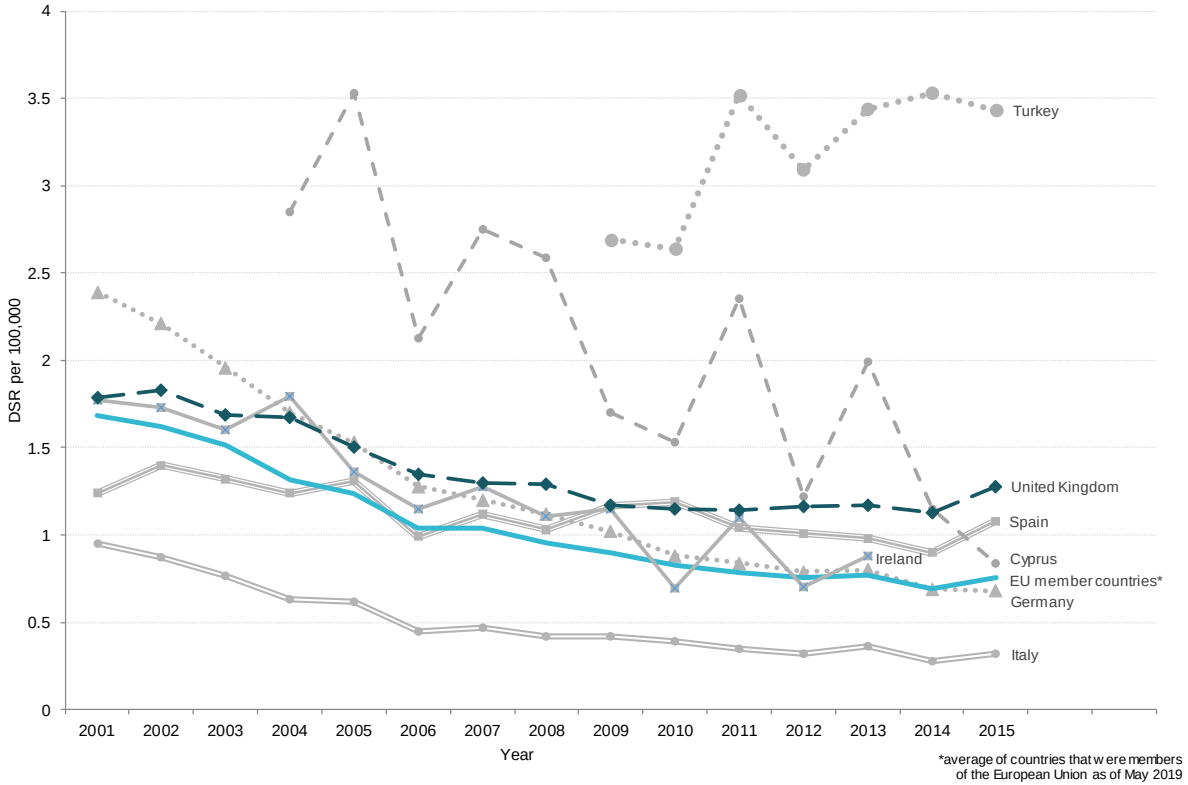
The maps and column chart display the latest period (2015 to 2017), during which CCG values ranged from 0.7 to 6.0 per 100,000 population, which is an 8.9-fold difference

between CCGs. The England value for 2015 to 2017 was 2.3 per 100,000 population.

The box plot shows the distribution of CCG values for the period 2006-2008 to 2015-2017. There was no significant change in any of the 3 variation measures between 2006 to 2008 and 2015 to 2017.

Asthma mortality is often a result of chronic poorly managed asthma, or asthma which responds poorly to treatment. There are many potential reasons for variation of mortality rates, but possible causes are differences between admission criteria at hospitals, inadequate assessment and under use of physiological measurements, patient confidence in self-managing their asthma, the availability of support or advice for patients who are at higher risk of acute asthma attacks, and patient adherence with asthma medications. The NRAD report also identified that the severity of asthma was often not correctly classified – consequently patients were under-treated and referral for a specialist opinion was delayed.

Figure 1: Mortality from asthma in selected EU countries[3]



Options for action

In order to learn from every death caused by asthma, the National Review of Asthma Deaths recommends:

- a structured local critical incident review, following a death from asthma, be carried out in primary care (this should include secondary care additionally, if appropriate) with help from a clinician with relevant expertise
- health professionals are aware of the factors increasing the risk of death from asthma, including concurrent mental health problems

The Healthcare Quality Improvement Partnership funded, National Asthma Audit administered by the Royal College of Physicians started data collection in November 2018 and will run for at least 3 years. The audit represents the first occasion on which primary and secondary care data will be linked. This gives clinicians and commissioners a unique opportunity to:

- better integrate care for patients leading to improved outcomes
- critically examine patient pathways to identify processes of care requiring improvement

Resources

Asthma UK Asthma facts and statistics [Accessed 2 August 2019]

British Lung Foundation Asthma statistics [Accessed 2 August 2019]

Royal College of Physicians (2014) National Review of Asthma Deaths – why asthma still kills [Accessed 2 August 2019]

Royal College of Physicians National Asthma and COPD Audit Programme [Accessed 30 July 2019]

Gupta RP, Mukherjee M, Sheikh A and others (2018) Persistent variations in national asthma mortality, hospital admissions and prevalence by socioeconomic status and region in England Thorax 73:706-712 [Accessed 10 June 2019]

[1] Royal College of Physicians (2014) National Review of Asthma Deaths - Why asthma still kills [Accessed 30 July 2019]
[2] Watson L, Turk F, James P and others (2007) Factors associated with mortality after an asthma admission: A national United Kingdom database analysis Respiratory Medicine 101(8):1659-64 doi: 10.1016/j.rmed.2007.03.006 [Accessed 30 July 2019]
[3] World Health Organization European Health Information Gateway [Accessed 4 June 2019]