Quick user guide

Maps

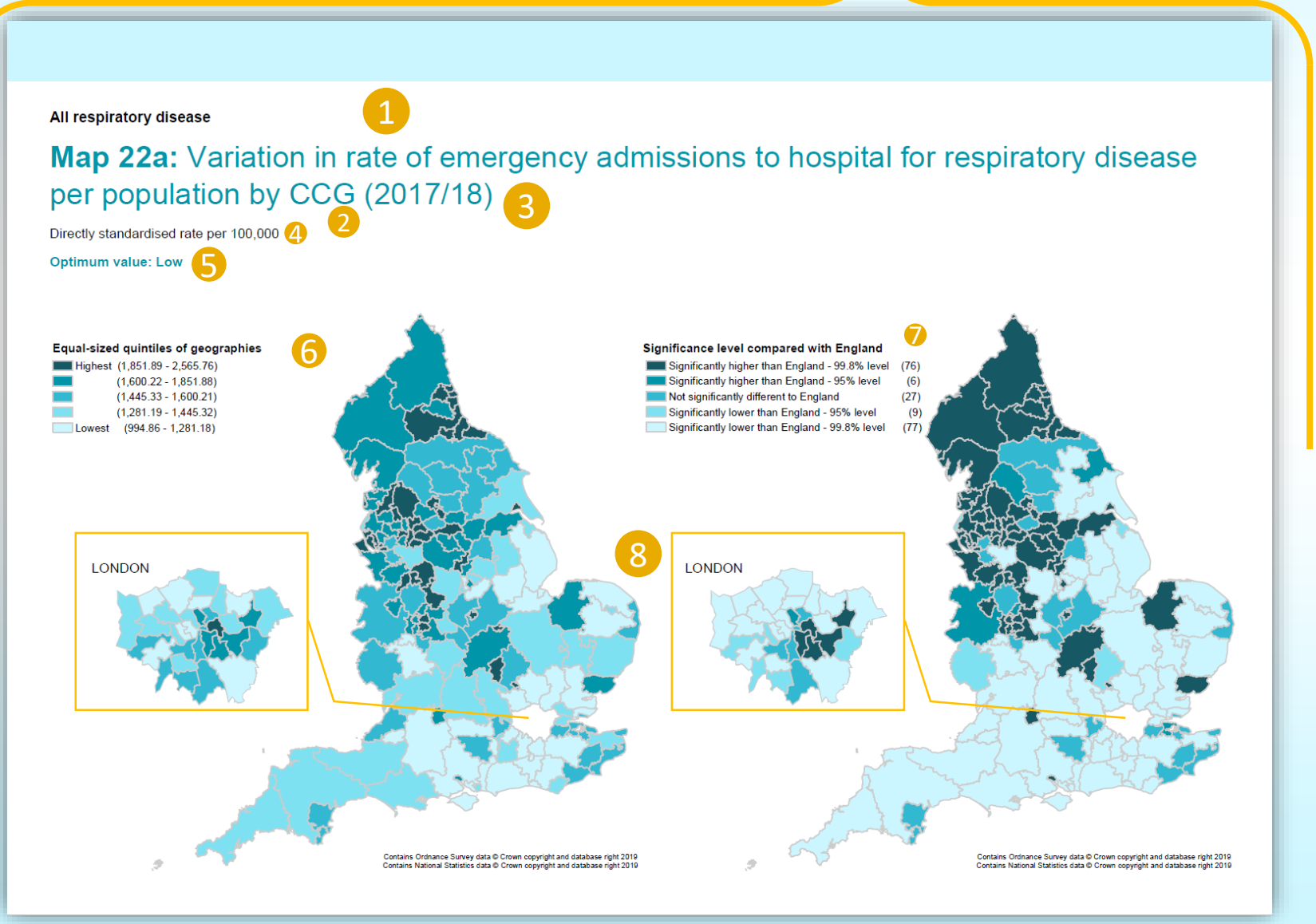
1 **Type of statistic** (e.g. rate, proportion)

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.

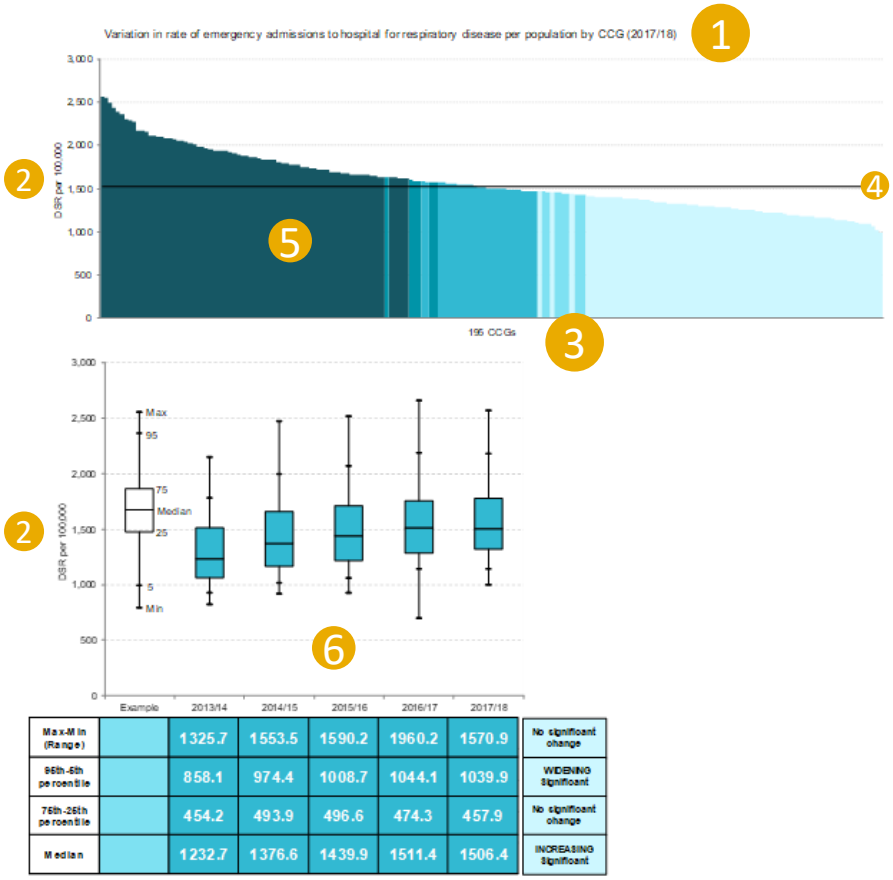
Chart, box plot and table

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

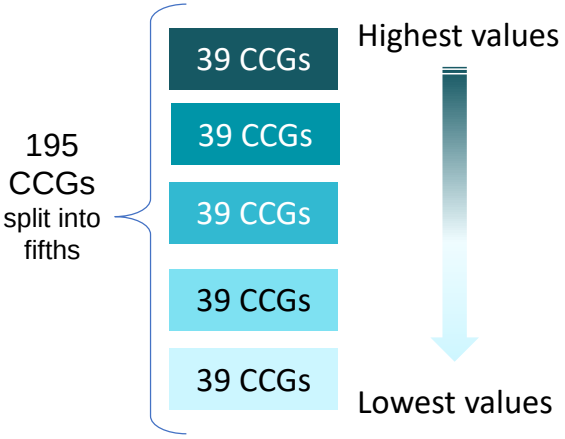
   Option for action – gives suggestions for best practice

   Resources – gives links to useful documents

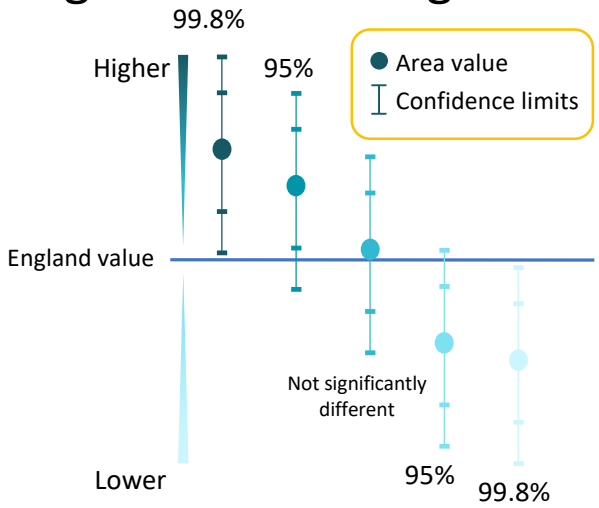
Quick user guide

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.

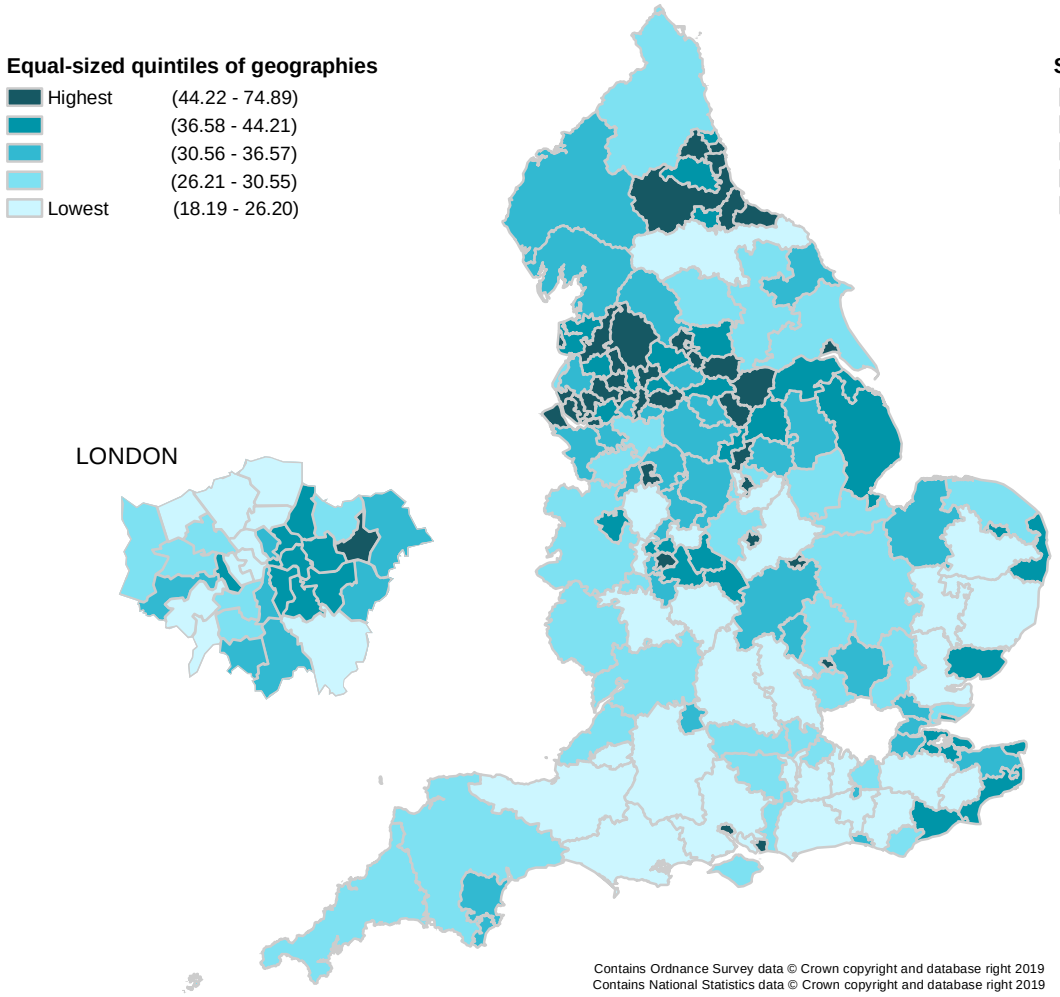
Box plot percentile	CCG rank position (195 CCGs in 2018)
Max	195
95%	Mid value between values of CCGs in ranks 185 and 186
75%	Mid value between values of CCGs in ranks 146 and 147
50% - Median	Mid value between values of CCGs in ranks 97 and 98
25%	Mid value between values of CCGs in ranks 48 and 49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

All respiratory disease – Disease burden

Map 21a: Variation in mortality rate from respiratory disease in persons aged under 75 years per population by CCG (2015-2017)

Directly standardised rate per 100,000

Optimum value: Low



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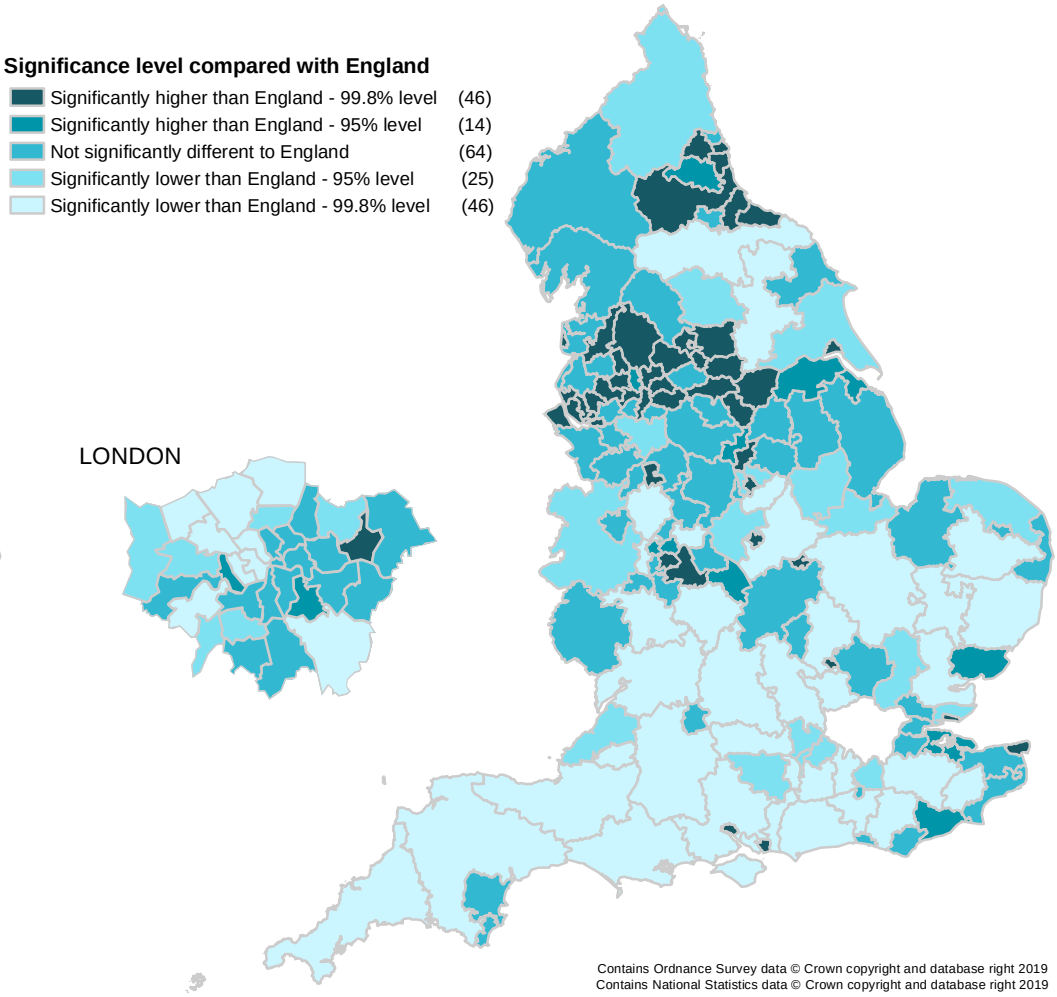

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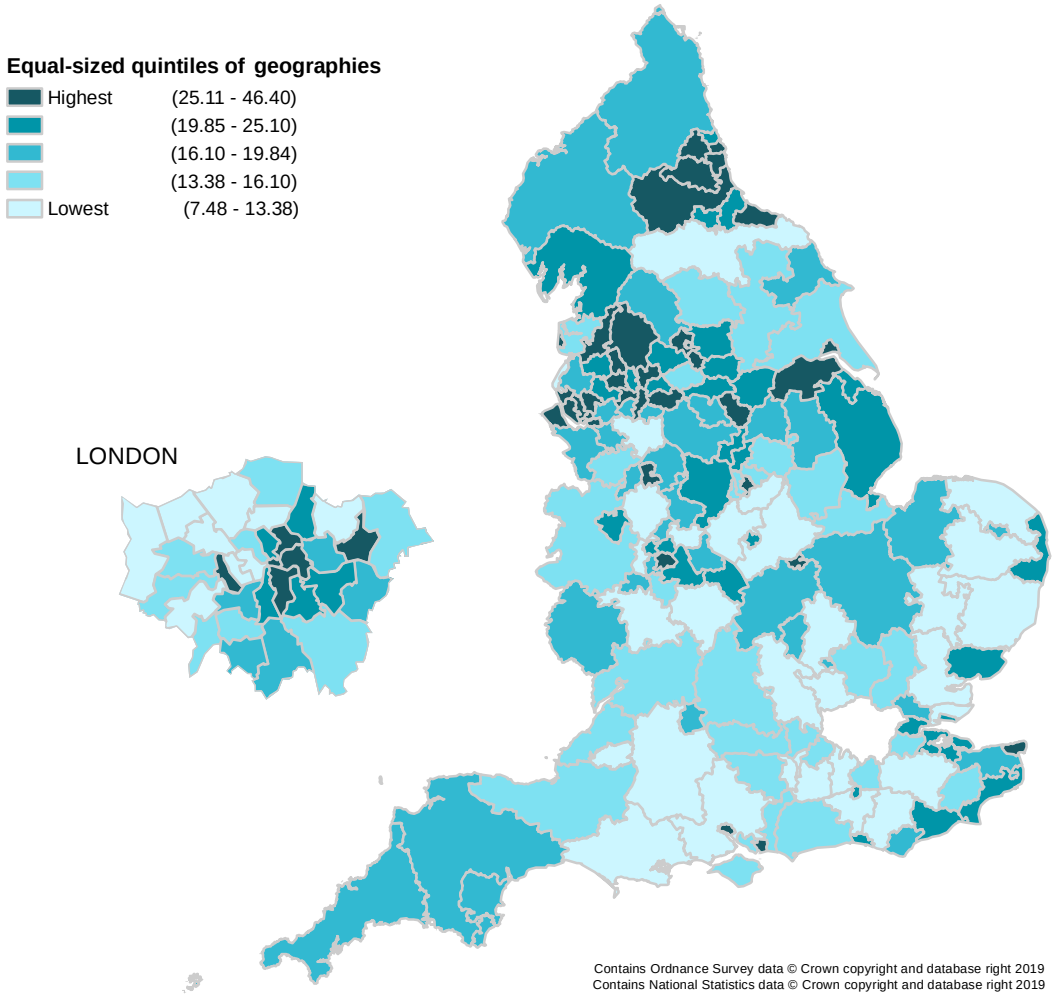
All respiratory disease – Disease burden

Map 21b: Variation in mortality rate from respiratory disease considered preventable in persons aged under 75 years per population by CCG (2015-2017)

Directly standardised rate per 100,000

Optimum value: Low



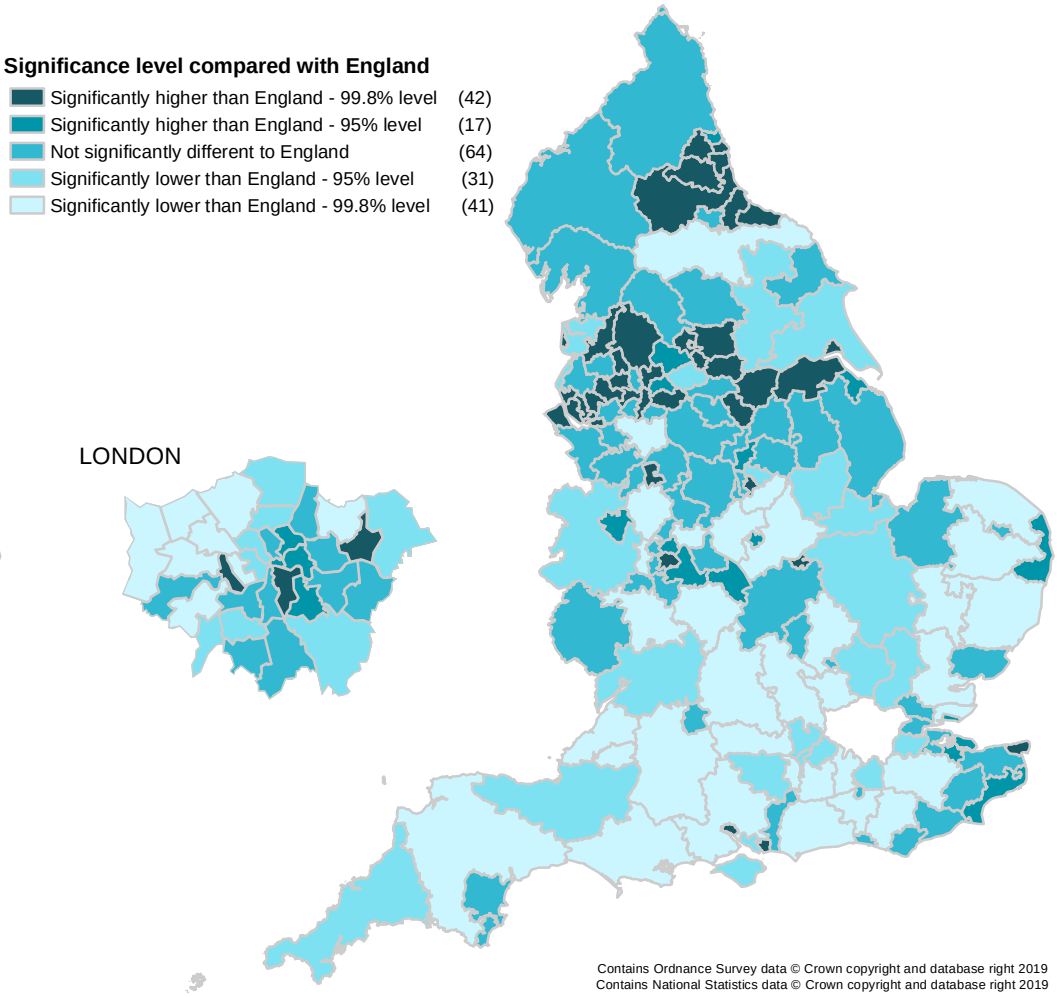
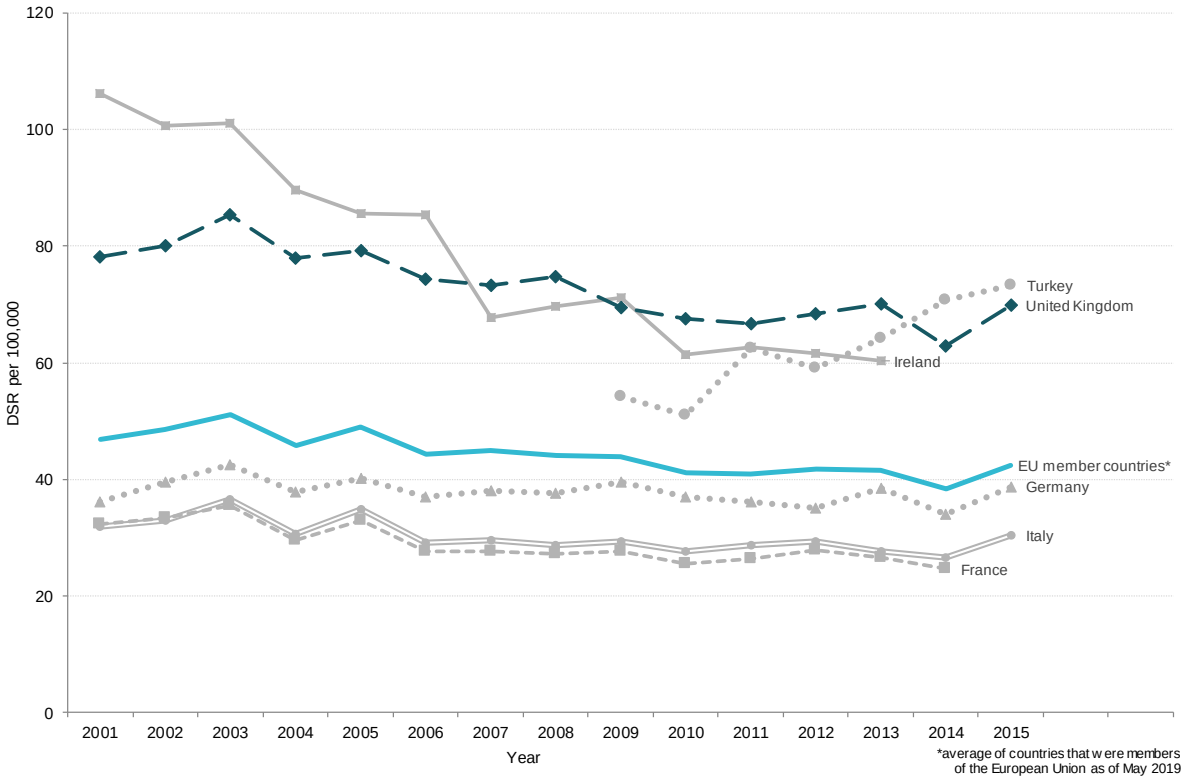


Figure 21.1: Mortality from respiratory disease in selected EU countries[1]



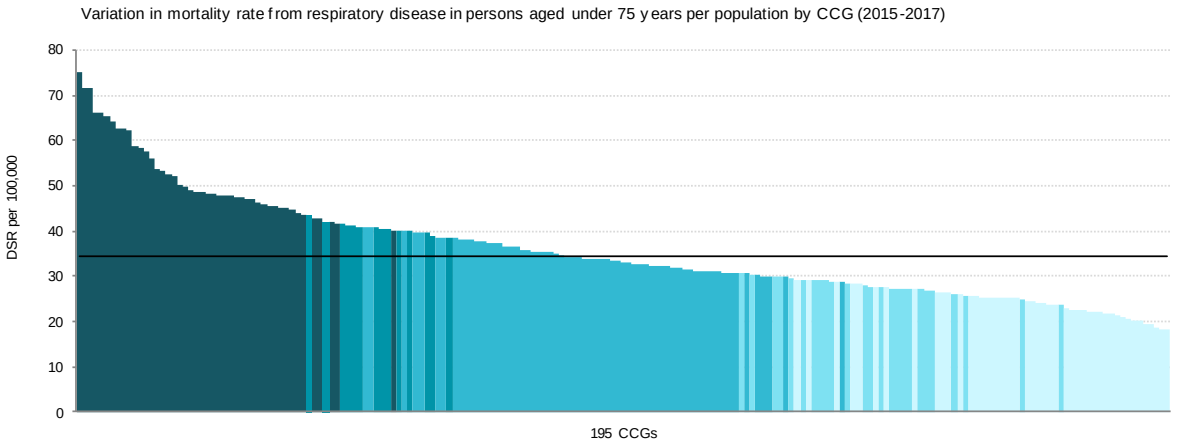
Context

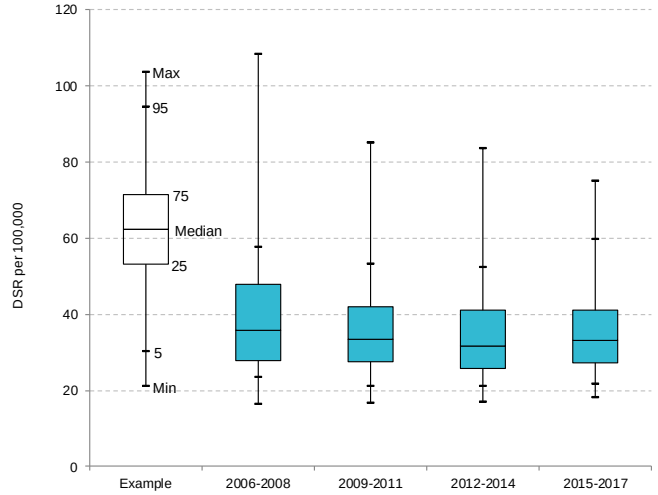
Whilst heart disease, stroke, dementia and Alzheimer's disease remain the major causes of premature death in the UK when data is standardised for age, respiratory conditions – particularly chronic respiratory disease – also contribute significantly.

Mortality rate from respiratory disease in these indicators refers to both acute and chronic upper and lower respiratory tract conditions, asthma, COPD, influenza and certain types of pneumonia. This is the definition of respiratory disease mortality monitored in the Public Health Outcomes Framework and NHS Outcomes Frameworks.[2] In this context, lung cancer and cystic fibrosis are not included as respiratory diseases.

It is recognised that some respiratory conditions can be seen to be preventable. Deaths are considered preventable if, in light of current understanding at the time of death, all or most deaths from the underlying cause could have been avoided by public health interventions.[3] Respiratory disease mortality for England in 2015 to 2017 was 34.3 per 100,000 population, the preventable mortality rate was 18.9 per 100,000. Therefore 55% of these respiratory deaths are considered potentially preventable. For example, one of the major respiratory causes of death in England is COPD. As smoking is the most common cause of COPD, it is seen as a preventable condition. It would be expected that improvements in public health policy and interventions aimed at reducing smoking would result in a decrease in the number of preventable deaths from respiratory causes.

Although mortality from respiratory disease has been falling overall over the previous 20 years in both the UK and Europe, mortality from the UK has been found to be





Max-Min (Range)		91.8	68.5	66.8	56.7	No significant change
95th-5th percentile		34.1	32.1	31.2	38.3	No significant change
75th-25th percentile		19.9	14.5	15.3	13.8	No significant change
Median		35.7	33.5	31.8	33.2	No significant change

consistently higher than most Western European countries (Figure 21.1). Within England, variations in mortality rates also exist, and are described within this section.

Magnitude of variation

Map 21a: Variation in mortality rate from respiratory disease in persons aged under 75 years per population by CCG (2015-2017)

The maps and column chart display the latest period (2015 to 2017), during which CCG values ranged from 18.2 to 74.9 per 100,000 population, which is a 4.1-fold difference between CCGs. The England value for 2015 to 2017 was 34.3 per 100,000 population.

The box plot shows the distribution of CCG values for the period 2006-2008 to 2015-2017.

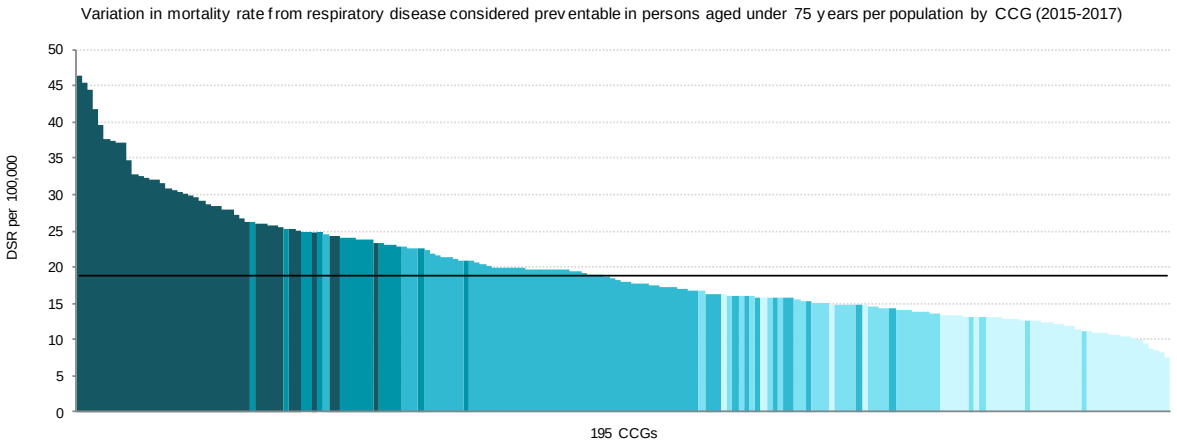
There was no significant change in any of the three variation measures between 2006 to 2008 and 2015 to 2017.

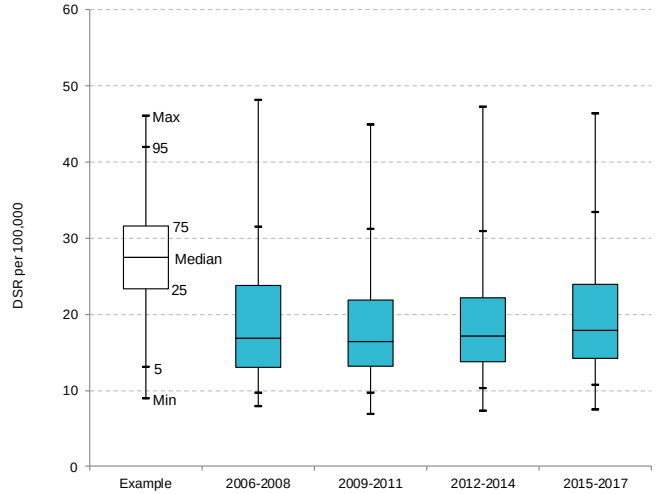
Map 21b: Variation in mortality rate from respiratory disease considered preventable in persons aged under 75 years per population by CCG (2015-2017)

The maps and column chart display the latest period (2015 to 2017), during which CCG values ranged from 7.5 to 46.4 per 100,000 population, which is a 6.2-fold difference between CCGs. The England value for 2015 to 2017 was 18.9 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 three variation measures between 2006 to 2008 and 2015 to 2017.





Max-Min (Range)		40.3	38.0	39.9	38.9	No significant change
95th-5th percentile		21.8	21.5	20.6	22.7	No significant change
75th-25th percentile		10.9	8.7	8.4	9.7	No significant change
Median		16.9	16.4	17.2	17.9	No significant change

Reasons for variation are likely to be multifactorial, and will also depend on the underlying respiratory disease. Geographical variation in prevalence of current and historical smoking patterns is one of the most important causes of this variation across many respiratory diseases.

Deaths from more acute causes such as pneumonia may be due to differences in secondary care protocols or admission criteria, whilst mortality rates from influenza can vary depending on local outbreaks and population characteristics. However, as with all respiratory diseases, early and correct diagnosis is paramount. This can be from both primary and secondary care.

Prompt diagnosis and treatment is necessary both in the community and within emergency departments. Variations in staff expertise and equipment availability may lead to discrepancies in outcomes between areas.[4]

Management of chronic conditions is usually delivered by healthcare professionals in primary care, and any discrepancies in primary care resulting in irregular reviews of chronic diseases or reduced lifestyle advice or treatment adherence may result in poorer disease management, and increased admission and subsequent mortality.

Options for action

It is important to ensure that patients have a personalised treatment plan and are encouraged to lead a healthier lifestyle. This can include referral to services such as smoking cessation, increasing physical activity and avoiding environmental triggers. The importance of treatment adherence should also be stressed, through improving health literacy and increasing patient efficacy, increased support from patient groups, and improving access to

specialised care such as respiratory physiotherapy and better drugs and devices.[5]

Commissioners should ensure that local services are delivering effective care in line with the latest national guidance for the relevant respiratory condition, and are promoting and signposting allied services.[6]

Secondary care services should have clear admission protocols for exacerbations of respiratory disease, and a low threshold for admission where secondary infection such as sepsis are a potential diagnosis.[7]

In both primary and secondary care, staff should have received training in the necessary equipment and procedures to diagnose and treat patients presenting with respiratory conditions, and refer to specialised services where necessary.[8]

In every contact with patients who have a diagnosis of a chronic respiratory condition, smoking status should be recorded and advice and encouragement to stop smoking should be offered where appropriate. Regular medication reviews should be conducted to increase compliance with the prescribed treatment regime, and discussion of potential side effects should take place.[5]

Staff should receive training in health literacy to ensure that patients understand the information being provided, and that it is in the most accessible form possible. Patients should also be aware of the symptoms of an acute exacerbation, and when they should seek medical advice.

Resources

Public Health England (2017) Health profile for England (2017) Chapter 2: major causes of death and how they have changed [Accessed 21 January 2019]

World Health Organization International Statistical Classification of Diseases and Related Health Problems 10th Revision [Accessed 21 January 2019]

Salciccioli J, Marshall D, Shalhoub J and others (2018) Respiratory disease mortality in the United Kingdom compared with EU15+ countries in 1985-2015: observational study BMJ 363:k4680 [Accessed 10 June 2019]

Lancashire County Council. Lancashire Insight: Respiratory Disease [Accessed 21 January 2019]

National Institute for Health and Care Excellence (2018) Chronic obstructive pulmonary disease in over 16s: diagnosis and management (NICE guideline [NG115]) [Accessed 19 February 2019]

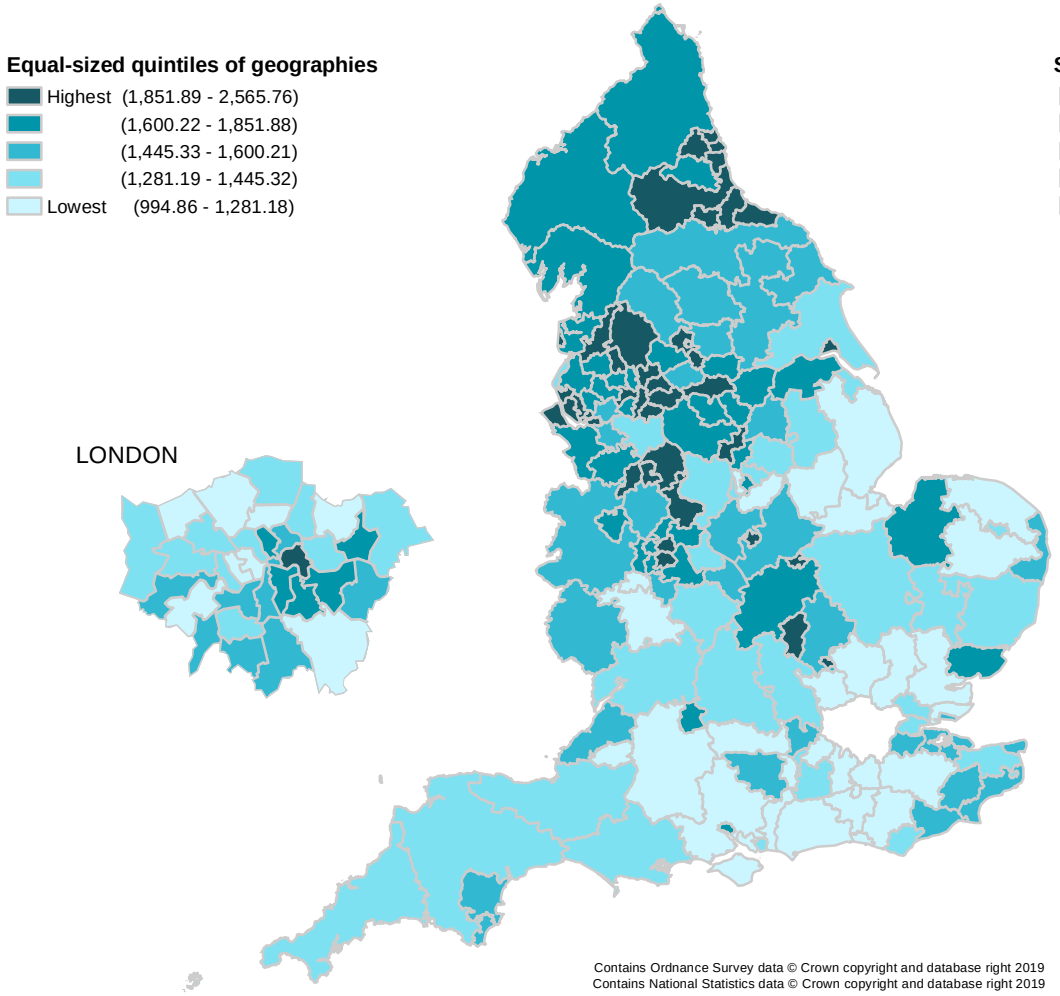
[1] World Health Organisation Health For All Data Explorer. HFAMDB_307: Diseases of the respiratory system, per 100 000 population, by sex (age-standardized death rate) [Accessed 04 June 2019]
[2] Public Health England (2013, updated 2019) Public Health Outcomes Framework [Accessed 07 August 2019]
[3] Lancashire County Council Respiratory Disease [Accessed 21 January 2019]
[4] Coates A, Tamari I, & Graham B (2014) Role of spirometry in primary care Canadian family physician, Medecin de famille canadien 60(12):1069–1077
[5] National Institute for Health and Care Excellence (2018) Chronic obstructive pulmonary disease in over 16s: diagnosis and management (NICE guideline [NG115]) [Accessed 19 February 2019]
[6] Respiratory Futures. An Introduction to integrated care. Available from: https://www.respiratoryfutures.org.uk/programmes/new-models-of-care/an-introduction-to-integrated-care/ [Accessed 07 August 2019]
[7] Stone R, Holzhauer-Barrie J, Lowe D and others (2017) COPD: Who cares when it matters most? National Chronic Obstructive Pulmonary Disease (COPD) Audit Programme: Outcomes from the clinical audit of COPD exacerbations admitted to acute units in England 2014. National supplementary report. London: RCP [Accessed 07 August 2019]
[8] The Primary Care Respiratory Society. Are you trained to do the job you do? [Accessed 07 August 2019]

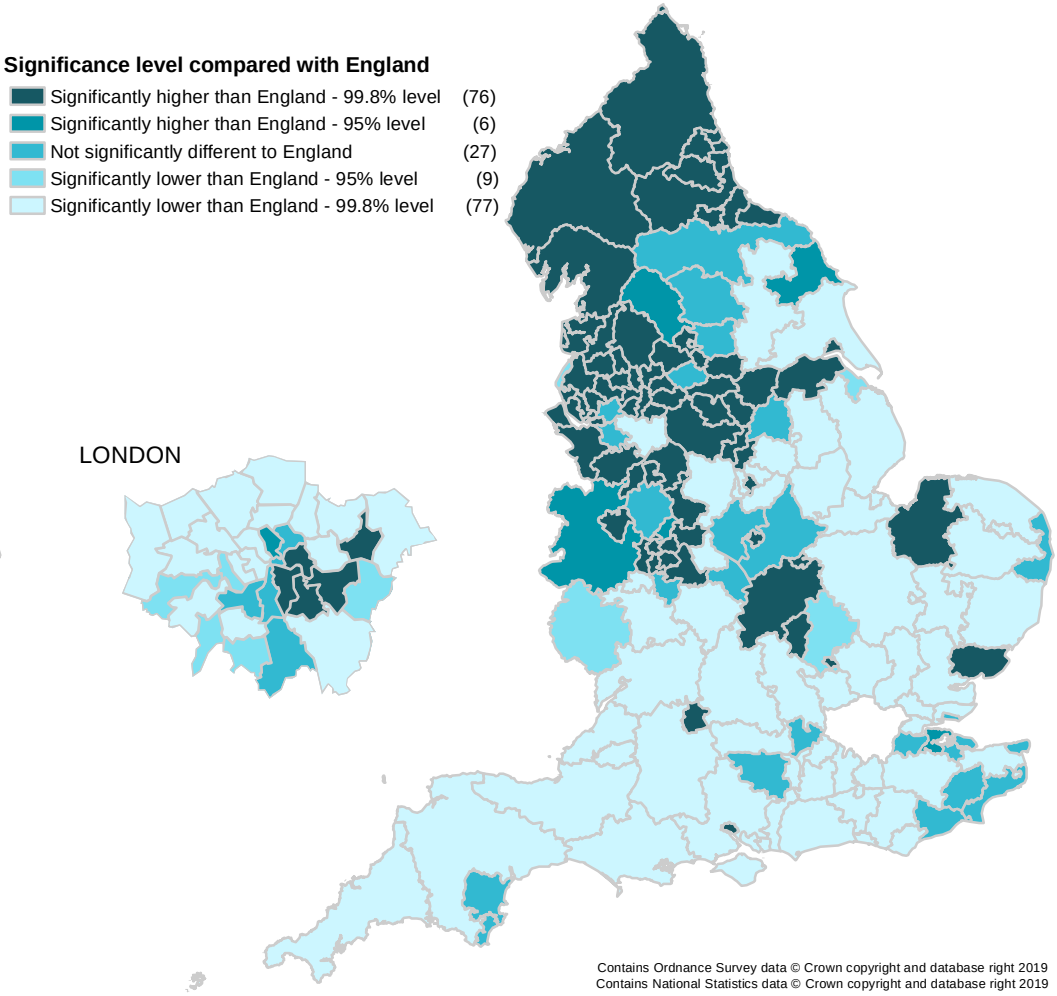
All respiratory disease – Hospital admissions

Map 22a: Variation in rate of emergency admissions to hospital for respiratory disease per population by CCG (2017/18)

Directly standardised rate per 100,000

Optimum value: Low

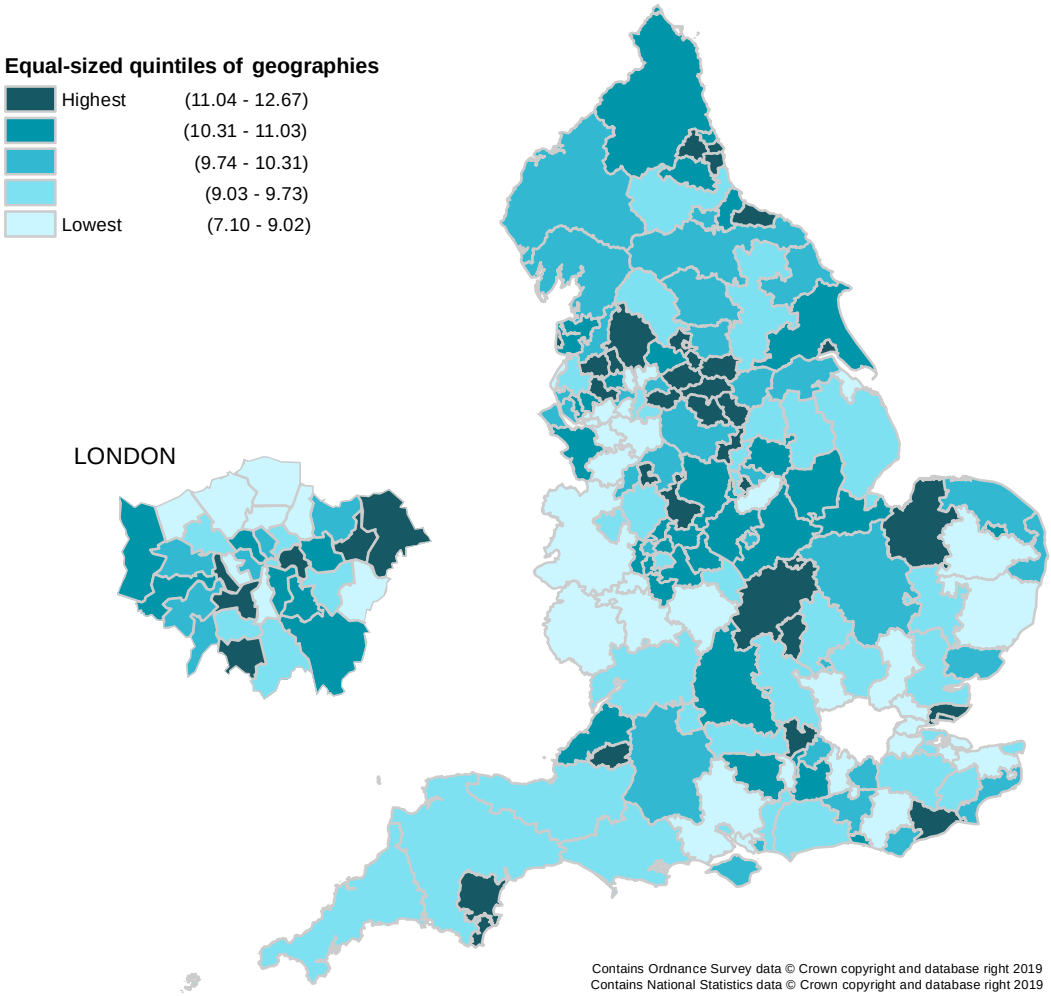




All respiratory disease – Hospital admissions

Map 22b: Experimental statistic: Variation in percentage of admissions to hospital for respiratory disease that were re-admitted as an emergency within 30 days of discharge by CCG (2017/18)

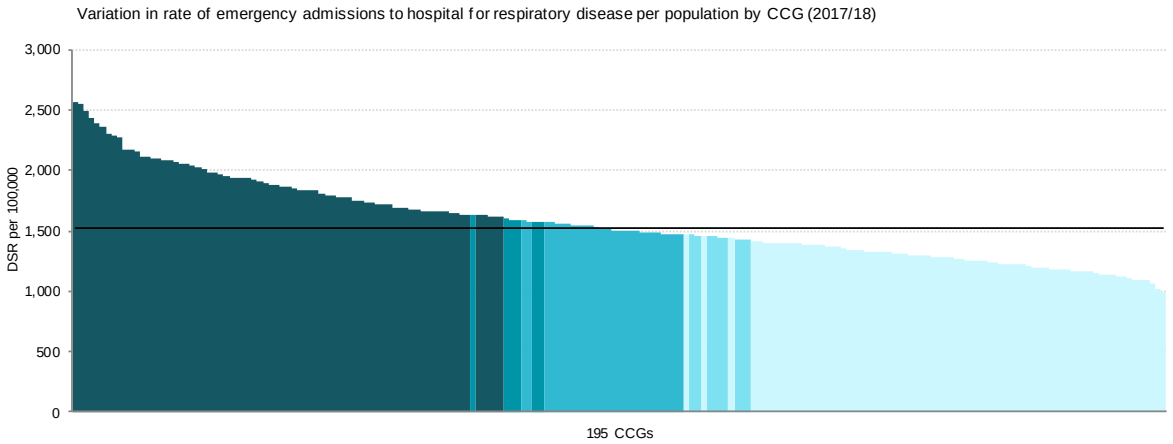
Optimum value: Low

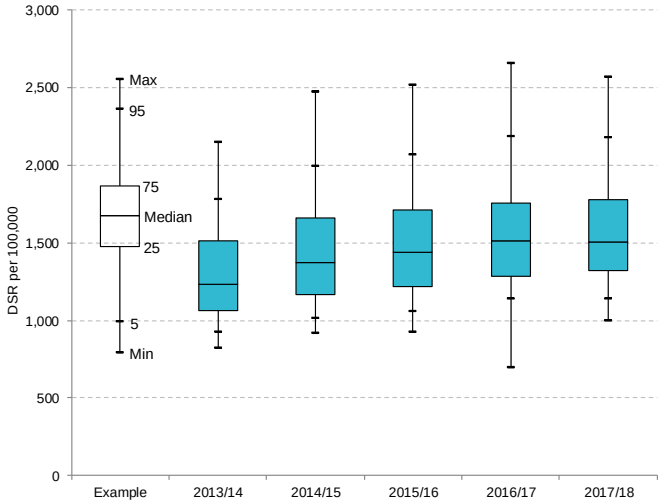


Context

An emergency admission to hospital is classified as 'when admission is unpredictable and at short notice because of clinical need'.[1] This may result from a patient being seen in primary care and referred to hospital immediately, from patients self-presenting to hospital emergency departments, or from patients being taken to hospital by emergency services. Admissions do not represent the number of patients, as some patients will have more than one admission during the same year. Some emergency admissions are zero-day stays, where patients do not require an overnight stay.

Respiratory disease in this indicator refers to both acute and chronic upper and lower respiratory tract conditions, asthma, COPD, influenza and certain types of pneumonia. This is the definition monitored in the Public Health Outcomes Framework and NHS Outcomes Frameworks.[2] In this context, lung cancer and cystic fibrosis are not included as respiratory diseases.





		2013/14	2014/15	2015/16	2016/17	2017/18	
Max-Min (Range)		1325.7	1553.5	1590.2	1960.2	1570.9	No significant change
95th-5th percentile		858.1	974.4	1008.7	1044.1	1039.9	WIDENING Significant
75th-25th percentile		454.2	493.9	496.6	474.3	457.9	No significant change
Median		1232.7	1376.6	1439.9	1511.4	1506.4	INCREASING Significant

Readmission rates are monitored as an important measure of quality of care as they can be an indicator of where poor patient outcomes could have potentially been avoided. Emergency readmission may also be avoided due to utilisation of alternative hospital services where they are available, such as admission to an ambulatory care unit rather than onto an acute medical ward, and so figures should be interpreted within the local context.

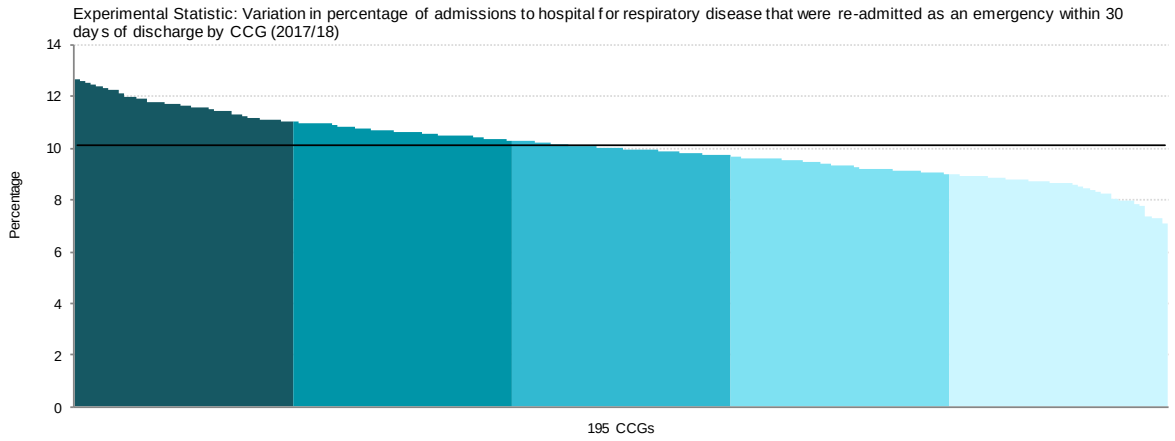
The burden of respiratory disease on hospital activity is significant. Currently for England 2017/18 there are over 850,000 hospital emergency admissions and more than 4.9 million bed days for respiratory disease. Exacerbations of COPD and asthma are significant causes of respiratory admissions, yet many episodes can be prevented by improved treatment compliance, symptom control and timely treatment of acute exacerbations.

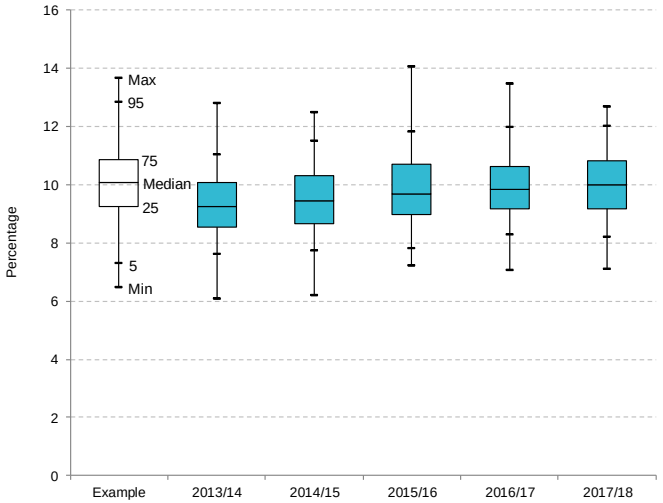
Magnitude of variation

Map 22a: Variation in rate of emergency admissions to hospital for respiratory disease per population by CCG (2017/18)

The maps and column chart display the latest period (2017/18), during which CCG values ranged from 994.9 to 2,565.8 per 100,000 population, which is a 2.6-fold difference between CCGs. The England value for 2017/18 was 1,523.0 per 100,000 population.

The box plot shows the distribution of CCG values for the period 2013/14 to 2017/18. Both the 95th to 5th percentile gap and the 75th to 25th percentile gap widened significantly.





		2013/14	2014/15	2015/16	2016/17	2017/18	
Max-Min (Range)		6.7	6.3	6.8	6.4	5.6	No significant change
95th-5th percentile		3.4	3.8	4.0	3.7	3.8	No significant change
75th-25th percentile		1.5	1.7	1.7	1.5	1.7	No significant change
Median		9.2	9.5	9.7	9.9	10.0	INCREASING Significant

Map 22b: Experimental statistic: Variation in percentage of admissions to hospital for respiratory disease that were re-admitted as an emergency within 30 days of discharge by CCG (2017/18)

The maps and column chart display the latest period (2017/18), during which CCG values ranged from 7.1 to 12.7%, which is a 1.8-fold difference between CCGs. The England value for 2017/18 was 10.1%.

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 three variation measures between 2013/14 and 2017/18. The median increased significantly from 9.2 in 2013/14 to 10.0 in 2017/18.

As previously noted, variations in readmission rates may be due to local hospital, integrated and primary care access/services. Patients may be readmitted to a frailty unit or ambulatory care suite rather than an acute medical ward, and so this may not represent poor quality of care. Readmission rates are higher in older adults who have chronic conditions, and may represent a breakdown in their social circumstances, and therefore readmission rates are likely to be higher in areas where there are a higher proportion of older adults.

However, readmission can also be due to patients being discharged prematurely from hospital. This may be due to inpatient pressures where hospitals are operating at or near full capacity. It may also be due to inappropriate or incomplete treatment, or misdiagnosis. It is therefore important that hospitals have clear admission protocols and pathways of care to ensure that patients provide the best possible care whilst admitted.

Options for action

Respiratory admission rates tend to be higher during winter. CCGs and local authorities can minimise the impact of this by utilising the cold weather plan produced by Public Health England.

Information should be shared about patient treatment and recommendations between primary, secondary and community healthcare teams. Primary care services should ensure patients who are identified as being at risk of hospital admission receive regular reviews of their respiratory disease.[3] Healthcare professionals carrying out the reviews should have received appropriate training and should be aware of the latest guidelines.[4,5] Evidence has shown that self-management plans can help reduce hospital admission rates, as well as improve quality of life.[6] Plans should be regularly reviewed, and can include an exacerbation plan if the patient is at risk of exacerbations.

Patients should be made aware of the community services available to them to support self-management plans for chronic conditions. These services are important in for enabling integrated population healthcare, reducing comorbidities and prevention of readmission.[7] Eligible patients should be encouraged to receive the annual influenza vaccination and the pneumococcus vaccine in order to reduce the complications of influenza and pneumonia, and so reduce hospital admissions.

Resources

British Lung Foundation (2016) The battle for breath – the impact of lung disease in the UK [Accessed 21 January 2019]

National Institute for Health and Care Excellence (2019) Chronic obstructive pulmonary disease in over 16s: diagnosis and management (NICE guidance [NG115]) [Accessed 19 February 2019]

Nuffield Trust (2018) Emergency readmissions: Trends in emergency readmissions to hospital in England [Accessed 21 January 2019]

Public Health England (2018) Cold weather plan for England: protecting health and reducing harm from the cold weather [Accessed 21 January 2019]

Public Health England (2015) Respiratory disease: applying All Our Health [Accessed 21 January 2019]

[1] NHS Digital Data Dictionary: Admission Method [Accessed 08 August 2019]
[2] Public Health England (2019) Public Health Outcomes Framework [Accessed 01 August 2019]
[3] National Institute for Health and Care Excellence (2019) Chronic obstructive pulmonary disease in over 16s: diagnosis and management (NICE guidance [NG115]) [Accessed 19 February 2019]
[4] The Primary Care Respiratory Society Are you trained to do the job you do? [Accessed 08 August 2019]
[5] Robinson F (2016) Be trained to do the job you do: our campaign for better education Primary Care Respiratory Update 7(1):15-17 [Accessed 08 August 2019]
[6] Effing T, Monninkhof E, van der Valk P and others (2007) Self-management education for patients with chronic obstructive pulmonary disease Cochrane Database Syst Rev 4:CD002990 doi: 10.1002/14651858.CD002990.pub2 [Accessed 08 August 2019]
[7] RightCare NHS RightCare Pathway: COPD [Accessed 08 August 2019]