

September 2012

NHS Atlas of Variation in Healthcare for People with Respiratory Disease

Reducing unwarranted variation to
increase value and improve quality

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The Respiratory Disease Atlas has been prepared in partnership with a wide range of organisations:



The East of England Public Health Observatory (ERPHO) monitors the health of the population of the East of England and helps the NHS and other organisations ensure that decisions and actions taken to improve health are supported by sound data and information.
<http://www.erpho.org.uk/>



NHS Information Centre for health and social care (NHS IC) is England's central authoritative source of essential data and statistical information for frontline decision-makers in health and social care.
<http://www.ic.nhs.uk/>



NHS Improvement – Lung supports the implementation of the National Outcomes Strategy for COPD and Asthma, together with the annual priorities of the DH Respiratory Programme Board. It does this by providing national expertise and practical solutions for the local improvement of respiratory services including COPD, asthma and oxygen services. The team works in partnership with each respiratory clinical network and local leaders in respiratory care, together with key stakeholders including the DH, professional societies and the leading national charities.
<http://www.improvement.nhs.uk/lung/>



The national Child and Maternal Health Observatory (ChiMat) provides information and intelligence to improve decision-making for high quality, cost effective services. It supports policy makers, commissioners, managers, regulators, and other health stakeholders working on children's, young people's and maternal health. This specialist observatory is part of the Yorkshire and Humber Public Health Observatory (YHPHO) which is part of a network of nine Public Health Observatories in England.
<http://www.chimat.org.uk/>



The British Lung Foundation is the UK's lung charity, leading the fight against lung disease through prevention, support and research. One person in five in the UK is affected by lung disease. We offer hope and support at every step, so that no one has to face it alone. We campaign for positive change in the nation's lung health. And we fund vital research into new treatments and cures.
BLF Helpline: 03000 030 555
<http://www.blf.org.uk>



Asthma UK is the UK's leading asthma charity, providing information, services, advice and support to the 5.4 million people with asthma in the UK. We aim to significantly reduce the numbers of people dying and being hospitalised by their asthma, and we work directly with healthcare professionals, politicians, schools, researchers and families to reduce the impact of asthma on people's lives.
<http://www.asthma.org.uk>



Solutions for Public Health (SPH) is a not-for-profit public health organisation within the NHS dedicated to better health and better healthcare for all. SPH works with decision-makers across the public and third sectors to improve health and reduce health inequalities. SPH brings together a unique synthesis of clinical and public health experience, analytical and research skills and business performance to help customers improve the services they offer and commission.
<http://www.sph.nhs.uk/>

Case-studies provided by:



Highfield Surgery is a GP practice in High Wycombe with three partners. Specialist practice nurses run several clinics including one for asthma and daily surgeries by appointment for smoking cessation.

<http://www.highfieldsurgeryhazlemere.co.uk>



Cheadle Medical Practice is a suburban GP practice in Stockport serving just under 12,000 patients. We are four partners and three salaried staff in a long-standing training practice who are keen on "real-life" audit that makes a difference to patient care. We have specialty leads and teams for various clinical areas, including a respiratory team, who are responsible for the project described in Case-study 2.

<http://www.cheadlemedical.co.uk>



NHS East of England: in October 2011, the 10 strategic health authorities in England merged to form four clusters, which will manage the NHS until April 2013. **NHS Midlands and East**, formed from NHS East of England, NHS East Midlands and NHS West Midlands, manages the healthcare of 15 million people from the borders of Wales across the Midlands to the coast of East Anglia, and is responsible for ensuring its £26 billion budget delivers better healthcare services for patients and value for money. Our core purposes are delivering for today, building for the future, and supporting our staff.

<http://www.midlandsandeast.nhs.uk/Home.aspx>



North East Lincolnshire Care Trust Plus has responsibility for commissioning health and adult social care services in North East Lincolnshire. It also manages the community health and adult social care staff who provide these services to local patients and service users. It replaces the former North East Lincolnshire PCT in full, as well as inheriting responsibility for the management of adult social care from North East Lincolnshire Council.

<http://www.nelctp.nhs.uk/ctp/>



NHS Dudley is responsible for the health and well-being of everyone in the Borough of Dudley. We work closely with NHS Trusts, local GPs, dentists, opticians and pharmacists, the local authority and voluntary sector organisations to ensure people in Dudley receive the right healthcare, in the right place and at the right time. We are committed to providing better health for all by improving opportunities in communities with poor health, improving access to high-quality healthcare and improving coverage of disease prevention services.

<http://www.nhsdudley.nhs.uk/index.asp?id=8125>



University Teaching Trust

Salford Royal NHS Foundation Trust is an integrated provider of hospital, community and primary care services, including the University Teaching Hospital, and has the highest consistent rating for service quality. It employs 6000 staff and provides local services to the City of Salford and specialist services to Greater Manchester and beyond. Specialist care is offered to people from all over the UK for brain, neuroscience, kidney, bone, intestine or skin conditions.

<http://www.srft.nhs.uk/>

safe • clean • personal

Imperial College London

Imperial College London is consistently rated among the world's best universities. It is a science-based institution with a reputation for excellence in teaching and research that attracts 14,000 students and 6,000 staff of the highest international quality. The College's innovative research explores the interface between science, medicine, engineering and business, delivering practical solutions that improve quality of life and the environment – underpinned by a dynamic enterprise culture. Imperial's contributions to society have included the discovery of penicillin, the development of holography and the foundations of fibre optics. This commitment to the application of research for the benefit of all continues today, with current focuses including interdisciplinary collaborations to improve global health, tackle climate change, develop sustainable sources of energy and address security challenges. In 2007, Imperial College London and Imperial College Healthcare NHS Trust formed the UK's first academic health science centre, with the aim of improving quality of life for patients and populations by taking new discoveries and translating them into new therapies as quickly as possible.

<http://www3.imperial.ac.uk/>

<http://www.ahsc.org.uk/>

Imperial College Healthcare NHS Trust

Imperial College Healthcare NHS Trust comprises Charing Cross, Hammersmith, Queen Charlotte's & Chelsea, St Mary's and Western Eye hospitals. With more than one million patient contacts each year, it is one of the largest acute Trusts in the country, and yet has some of the lowest mortality rates according to the Dr Foster Guide – an annual, independent report published in 2011. The Trust has an annual turnover of around £900 million, and is one of eleven NIHR Biomedical Research Centres.

<http://www.imperial.nhs.uk/>

NHS Leicester City

NHS Leicester City is the organisation responsible for buying the health services which best meet the needs of Leicester people. With an annual budget of around £500 million we commission a wide range of services. Our aims are to improve the health of the people of Leicester and to address health inequalities across the city. The range of services includes emergency and acute care, general practice, rehabilitation and therapies, mental health care, ophthalmic, pharmacy and dentistry.

<http://www.leicestercity.nhs.uk/>

Isle of Wight NHS Trust

NHS Isle of Wight: the Isle of Wight is the largest off-shore community in England and Wales, comprising a unique health and social care economy because of the relatively small total resident population (140,500), the relatively high prisoner population (1700) and a substantial visitor population. In combination, these factors create unique service commissioning and delivery challenges and opportunities; for instance, our local population is below the level 'typically' considered the minimum to support the range of services provided in an English district general hospital.

<http://www.iow.nhs.uk/>

NHS London

NHS London, London Respiratory Team: our aim is to improve the experience of Londoners with COPD and minimise the impact of the disease. We intend to do this by supporting clinicians, managers, commissioners and education providers who have a role in supporting people with COPD. One of the team's key features is to work across boundaries with other health and social care professionals such as mental health and smoking cessation teams to understand how we can reach all Londoners.

<http://www.london.nhs.uk/what-we-do/our-current-projects/london-respiratory-team>

East Kent Hospitals University NHS Foundation Trust

East Kent Hospitals University NHS Foundation Trust is one of the largest hospital trusts in England, with five hospitals serving a local population of around 720,500 people. We also provide many health services from other NHS facilities across East Kent including renal services in Medway and Maidstone. We have a national and international reputation for delivering high-quality specialist care, particularly in cancer, kidney disease, stroke and vascular services.

<http://www.ekhft.nhs.uk/>

Right Care continues to pay homage to the inspirational publication, *The Dartmouth Atlas of Health Care*, and the vision and commitment of Professor John Wennberg who first charted this territory.

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Foreword

Respiratory disease is very common and a major cause of disability and premature mortality. It is the third leading cause of death in England after circulatory disease and cancer. It is also one of the principal reasons for emergency admission to hospital and, as a result, it accounts for a substantial proportion of NHS expenditure.

Robust guidance has been published by NICE and other bodies to support evidence-based management of chronic obstructive pulmonary disease (COPD), asthma and other lung conditions, and yet in this *NHS Atlas of Variation in Healthcare for People with Respiratory Disease* a stark picture is presented of the variation in the quality of care and outcomes experienced by people with respiratory disease in different parts of England. The variation observed extends to the detection of disease: late diagnosis is common, and diagnosis is often not made until the condition is severe and as a consequence expensive hospital admissions are more frequent.

Thus, an individual's chance of being admitted or re-admitted to hospital as an emergency, of receiving appropriate treatment, of dying from lung disease or even of being diagnosed in the first place differs according to where they live. Clearly, admission to hospital, premature death, receiving inadequate or inappropriate treatment and delay in diagnosis are important adverse outcomes for patients. Of course, some degree of variation may be explained by population composition, levels of deprivation or disease prevalence. However, much of the variation highlighted in the Respiratory Disease Atlas is unwarranted.

The most striking illustration of unwarranted variation is that, after adjusting for population differences, if all the PCTs in England were to achieve the COPD mortality rates of the best-performing PCTs, around 7,800 lives would be saved each year.

The central message of the *NHS Atlas of Variation in Healthcare* is that it is possible to achieve better outcomes for patients. Although data may be open to more than one interpretation, the power of the Atlas lies not in the answers it provides but in the questions it raises. When looking at local data, clinicians and commissioners need to ask whether the outcomes they are achieving for patients are as good as those achieved by the best. If not, they will want to explore how performance in primary and secondary care locally compares with the best, and whether they offer the services and have the systems in place that elsewhere have been shown to deliver high-quality evidence-based care.

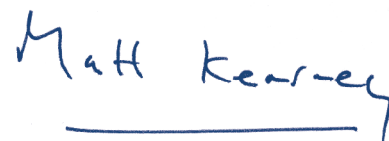
The 2011 Outcomes Strategy for COPD and Asthma sets out six over-arching objectives to help improve outcomes in respiratory disease. The NHS Companion Document to the Strategy identifies the key actions that NHS providers need to take to deliver these objectives and to improve the quality of care and outcomes experienced by patients across the five domains of the NHS Outcomes Framework. Together with the Respiratory Disease Atlas, these two important documents can be used by healthcare professionals to increase the value of care they offer to people with respiratory disease.



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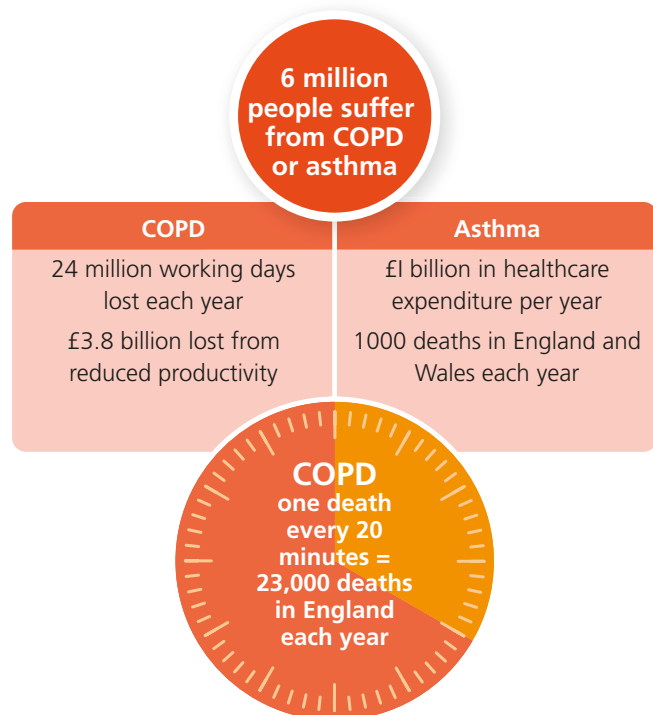
Reducing unwarranted variation: right care for people with respiratory disease

The burden and impact of respiratory disease

Respiratory conditions are very common – over 6 million people in England suffer from asthma or COPD – and they inflict a heavy burden on patients and carers and account for a significant proportion of NHS and social care expenditure (see Figure I.1). Respiratory disease is the third leading cause of death in England after circulatory disease and cancer.

In England, around 23,000 people die from COPD each year, equivalent to one death every 20 minutes. Acute exacerbation of COPD is itself a high-mortality condition: 15% of those admitted to hospital with COPD die within three months, which is higher than the rate for acute myocardial infarction at 13%.

FIGURE I.1: RESPIRATORY DISEASE BY NUMBERS



COPD is the second most common cause of emergency admission to hospital, and one of the most costly inpatient conditions to be treated by the NHS. Over 50% of people currently diagnosed with COPD are below retirement age and 24 million working days are lost each year from COPD while an estimated £3.8 billion is lost through reduced productivity.¹

Despite the magnitude of disease impact, a majority of people with COPD, including many of those with moderate and severe disease, remain undiagnosed. Indeed 10% of emergency COPD admissions are in people who have not previously been diagnosed with the condition.

There are around 1000 deaths from asthma each year in England and Wales, and around 90% of these are believed to be preventable through pro-active healthcare and support for self-management.

Healthcare expenditure on asthma is around £1 billion per year.

The powerful case for change to improve outcomes in respiratory disease was clearly articulated in the recently published Outcomes Strategy for COPD and Asthma² and the accompanying NHS Companion Document.³

In revealing the extent of variation in clinical activity and outcomes, the indicators presented in this *NHS Atlas of Variation in Healthcare for People with Respiratory Disease* underline the substantial scope clinicians and commissioners have to improve outcomes by ensuring that all patients receive the quality of care that is delivered in the best-performing localities.

Why does unwarranted variation matter?

It has long been acknowledged that some variation is inevitable in the healthcare and outcomes experienced by patients. However, John Wennberg, who has

1 British Thoracic Society (2006) *Burden of Lung Disease*, 2nd edition. BTS.

2 Department of Health (2011) An outcomes strategy for people with chronic obstructive pulmonary disease (COPD) and Asthma in England. http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_127974

3 Department of Health (2012) An Outcomes Strategy for COPD and Asthma: NHS Companion Document. http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_134000

championed research into clinical variation over four decades and who founded the pioneering *Dartmouth Atlas of Health Care*, concludes that:

“much of the variation ... is accounted for by the willingness and ability of doctors to offer treatment rather than differences in illness or patient preference”.

Wennberg defines unwarranted variation in healthcare as variation that cannot be explained on the basis of illness, medical evidence, or patient preference.⁴

In the *NHS Atlas of Variation in Healthcare*,⁵ first published in 2010, it was demonstrated that unwarranted variation is ubiquitous in England across a wide range of conditions. In the 2011 King’s Fund report, *Variations in Health Care – the Good, the Bad and the Inexplicable*,⁶ it was concluded that:

“the existence of persistent unwarranted variations in health care directly impacts on equity of access to services, the health outcomes of populations and efficient use of resources”.

In evaluating variation in clinical practice, Wennberg⁷ suggests categorising healthcare into three groups as follows:

- *Effective care*, defined as interventions for which the benefits far outweigh the risks; in this case the “right” rate of treatment is 100% of patients defined by evidence-based guidelines to be in need, and unwarranted variation is generally a matter of under-use.
- *Preference-sensitive care*, defined as when more than one generally accepted treatment option is available, such as elective surgery; here, the right rate should depend on informed patient choice, but treatment rates can vary extensively due to differences in professional opinion.
- *Supply-sensitive care*, which comprises clinical activities such as consultations, diagnostic tests, and hospital admissions, for which the frequency of use relates to the capacity and performance of the

local healthcare system; these measures commonly reflect care for people with long-term conditions; as Wennberg notes, high rates of use of supply-sensitive care do not necessarily correlate with better outcomes.

Does unwarranted variation matter to patients?

Unwarranted variation matters to patients (see Figure I.2). Clearly, premature death is an important adverse outcome. So too is a preventable exacerbation of COPD or asthma, emergency admission or re-admission to hospital, diminished quality of life and inability to work or play because of deteriorating lung function, and late or inaccurate diagnosis when diagnosis and appropriate treatment can influence outcomes. If patients experience a several-fold difference in their chance of being diagnosed promptly, of receiving the right care to control symptoms or prevent deterioration, of being admitted to hospital as an emergency or of dying prematurely, and if this variation is largely dependent on where they live or which practice they are registered with, they have a right to ask why, and to demand better.

FIGURE I.2: IMPORTANCE OF UNWARRANTED VARIATION TO PATIENTS WITH RESPIRATORY DISEASE

Why does unwarranted variation matter to patients with respiratory disease?	<ul style="list-style-type: none"> Late or inaccurate diagnosis Deteriorating lung function Inability to work or play Diminished quality of life Preventable exacerbations Emergency admission or re-admission to hospital Premature death
--	---

It is for this reason that in the *NHS Atlas of Variation in Healthcare, November 2011*⁸ it was concluded that:

“the need to identify and reduce unwarranted variation must be placed at the centre of commissioning decision-making, and also needs to be a priority for clinicians and patients.”

4 Wennberg J (2010) *Tracking Medicine: A Researcher’s Quest to Understand Health Care*. Oxford University Press.

5 Right Care (2010) *NHS Atlas of Variation in Healthcare, November 2010*. <http://www.rightcare.nhs.uk/atlas/>

6 Appleby J, Raleigh V (2011) *Variations in Health Care – the Good, the Bad and the Inexplicable*. The King’s Fund. http://www.kingsfund.org.uk/publications/healthcare_variation.html

7 Wennberg J, Thompson P (2011) Time to tackle unwarranted variations in practice. *British Medical Journal* 342:d1513.

8 Right Care (2011) *The NHS Atlas of Variation in Healthcare, November 2011*. <http://www.rightcare.nhs.uk/atlas/>

What can we do about unwarranted variation?

In the *NHS Atlas of Variation in Healthcare for People with Respiratory Disease*, data relating to key outcomes and high-impact processes in several respiratory conditions – COPD, asthma, sleep disorders, bronchiolitis and pneumonia – are presented. A common theme to emerge is that whichever indicator we examine there is considerable geographical variation in clinical care and outcomes. The variation is displayed at PCT level. However, it is important to recognise that the activity or outcome data presented in the Respiratory Disease Atlas represent an average for each PCT and this average frequently reflects an even wider variation at practice or provider level.

A key observation about the data presented in the maps and charts is that they do not tell us why there is variation. It is not simply a matter of deciding which end of the range demonstrates good or poor performance and of targeting the outliers. The strength of these maps lies not in the answers they provide but in the questions they generate. For instance, a local clinician or commissioner will want to know whether their clinical commissioning group is performing as well as the best, and, if not, to understand the reasons why.

- › What are the differences between local providers and the best providers?
- › Do they offer similar services?
- › How do they compare in the way services are delivered, such as the systems for referral, access, pathways of care, clinical processes and prescribing, extent of integration, support and training for staff, audit of outcomes and adherence to evidence-based guidelines?

An important challenge for clinical commissioning groups is how to engage local clinicians in the drive to improve outcomes by reducing unwarranted variation. As recognised in the King's Fund report:⁶

“knowledge does not, unfortunately, always lead to action. Publicising the existence of unwarranted variations and their causes does not guarantee that they will be tackled”.

Indeed, some clinicians will lack the expertise to interpret data in detail and some may respond defensively to its publication.

If clinicians and commissioners are to use data to drive change locally, several essential steps need to be taken (see Box I.1 and Figure I.3).

Box I.1: Essential steps in the use of data to drive change

- › Use locally relevant data
- › Conduct benchmarking to allow comparison of local practices and providers and comparison with similar localities nationally
- › Examine variation in outcomes and clinical activity
- › Develop a clear narrative to explain why unwarranted variation matters locally; for example, high admission rates mean poor outcomes for patients and high costs to commissioners
- › Identify the important questions the narrative raises about the structure and delivery of care
- › Audit whether evidence-based care and good practice is being delivered in a systematic way
- › Take a population-based systems approach to reducing unwarranted variation to ensure the delivery of better value and better outcomes for patients and for the local population
- › Monitor variation over time

Why is the narrative about unwarranted variation important?

The narrative about unwarranted variation is the most crucial step on the pathway from data to change (see Figure I.4). The narrative helps clinicians and commissioners to understand the magnitude of the problem locally, the impact on population outcomes and the opportunity costs of not reducing unwarranted variation. It helps both commissioners and clinicians to take responsibility for local variations in care and outcomes and the need for change in local services, to acknowledge that being “above average” is not enough, to ask searching questions about how care is delivered across the entire pathway, and to explore solutions that can be owned by both the clinical community and the commissioning community.

FIGURE I.3: ESSENTIAL STEPS IN THE USE OF DATA TO DRIVE CHANGE

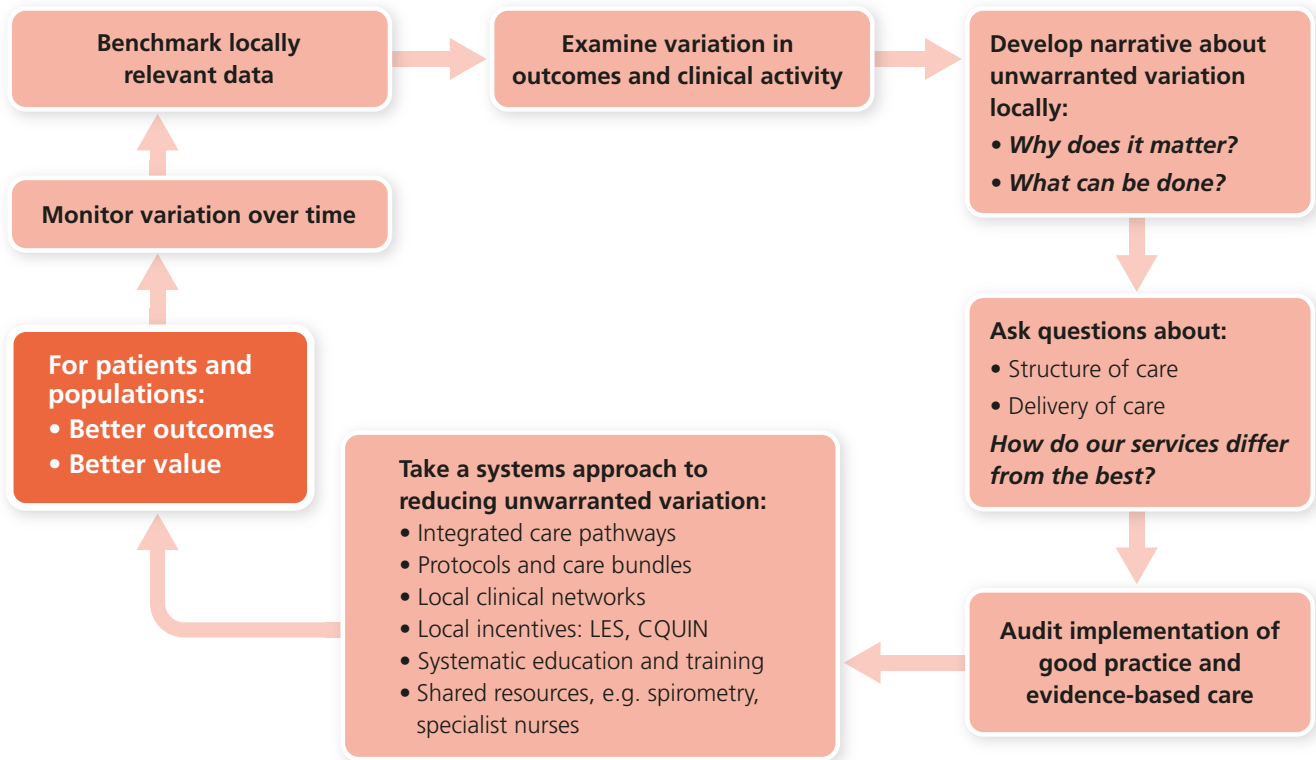
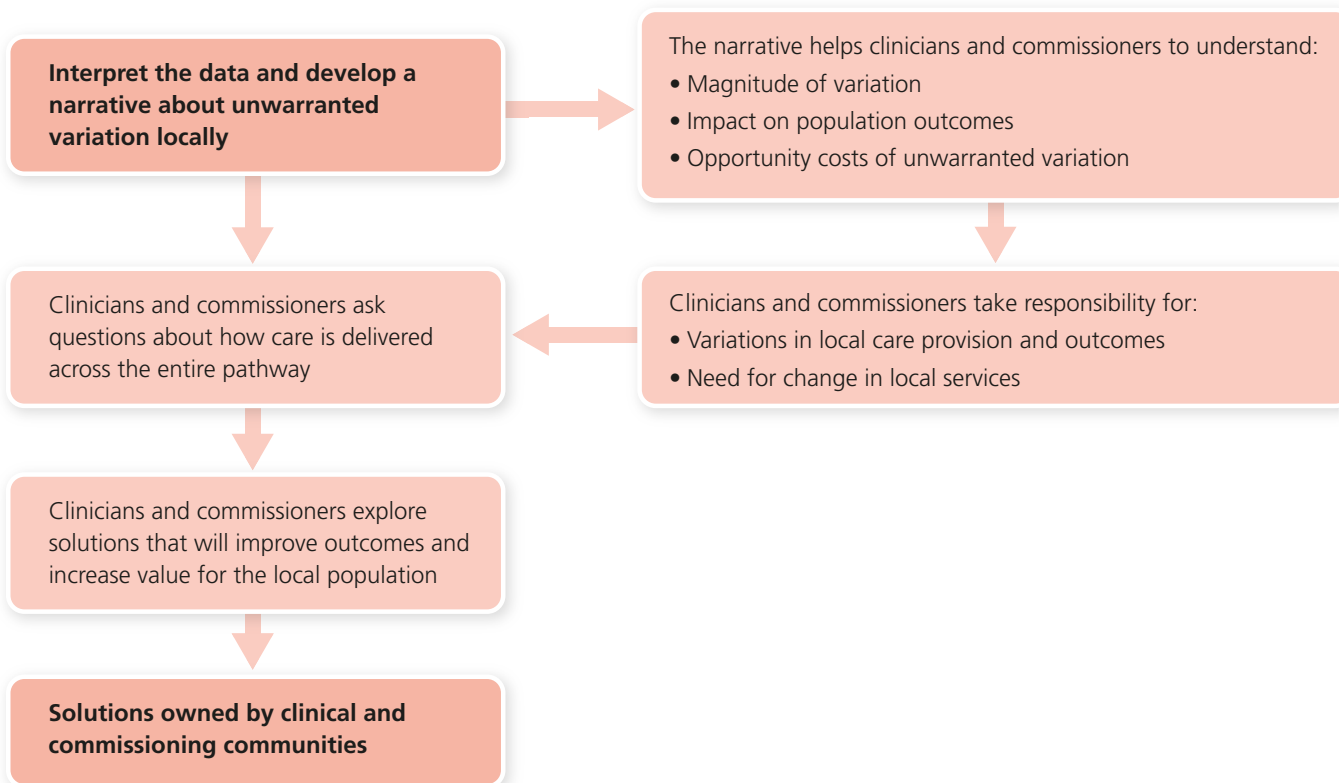


FIGURE I.4: IMPORTANCE OF THE NARRATIVE IN DRIVING CHANGE



Improving outcomes in respiratory disease: the role of clinical commissioning groups

When they become fully operational in 2013, clinical commissioning groups will be held to account for the delivery of outcomes for their patients through the indicators in the NHS Outcomes Framework. Clinical commissioning groups will therefore have an express responsibility not only for the quality of the services they commission but also for the quality of primary care provided by constituent local practices.

Several resources are available to support local commissioning groups in the task of improving outcomes for patients with respiratory disease (see Box I.2).

Box I.2: Improving outcomes for people with respiratory disease – resources available

- › Department of Health (2011) An Outcomes Strategy for COPD and Asthma: NHS Companion Document. http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_134000
- › NHS Medical Directorate (2012) COPD Commissioning Toolkit. A Resource for Commissioners. <https://www.wp.dh.gov.uk/publications/files/2012/08/chronic-obstructive-pulmonary-disease-COPD-commissioning-toolkit.pdf>
- › NHS Improvement – Lung; resources on the website: <http://www.improvement.nhs.uk/lung/>
- › IMPRESS – Improving and integrating respiratory services; resources on the website: <http://www.impressresp.com/>
- › Quality Intelligence East. INHALE – Interactive Health Atlas for Lung conditions in England. <http://www.inhale.nhs.uk/>

Forthcoming publications

- › Guide to Performing Quality Assured Spirometry
- › Asthma Good Practice Guides

The value of getting the basics right

The indicators presented in the Respiratory Disease Atlas, and the accompanying case-studies, show that in striving to improve outcomes for patients with respiratory disease there is much to be gained by focussing on getting the basics right:

- › ensuring early accurate diagnosis;
- › integration of care;
- › responsible prescribing;
- › support for self-management;
- › expert care out of hospital when possible;
- › expert care in hospital when admission is essential.

Clinical commissioning groups can use various strategies to improve care locally:

1. working with local respiratory leads and networks to develop integrated care pathways, care bundles and management protocols;
2. auditing adherence to clinical guidelines;
3. developing programmes of education and training for clinicians involved in respiratory care;
4. sharing resources across practices to maximise access to high-quality care, for example, specialist nurses and quality-assured spirometry;
5. providing incentives through CQINs and local enhanced services (LES);
6. engaging with patient groups to promote shared decision-making.

A systematic approach to targeting unwarranted variation and “getting the basics right” – i.e. ensuring the right care for the right patient at the right time – will not only improve the quality of life for individual patients with respiratory disease but will also increase the value of healthcare for the population as a whole.

Map and chart presentation

Selection of indicators

In developing the Respiratory Disease Atlas, we have focused on major respiratory diseases that impose a large burden on individuals and the NHS. This is reflected in the inclusion of respiratory indicators in Domains 1, 2 and 3 of the NHS Outcomes Framework.

In the Outcomes Strategy for COPD and Asthma, substantial room for improvement in patient outcomes and quality of care has been identified for both conditions. Pneumonia is a leading cause of premature mortality, and obstructive sleep apnoea (OSA) is undiagnosed and untreated in most people who suffer from the condition.

In each case, we have selected indicators that reflect:

- › important outcomes, such as death or hospital admission;
- › high-impact processes, such as diagnosis or access to regular clinical review.

We have also selected one indicator examining respiratory prescribing, common to both asthma and COPD, and one for smoking cessation, because smoking is the single most important aetiological factor for respiratory disease.

Order of appearance

Indicators in the Respiratory Disease Atlas are grouped under individual respiratory conditions:

- › COPD;
- › Asthma;
- › Pneumonia;
- › Sleep-disordered breathing;
- › Bronchiolitis.

The indicators grouped by respiratory condition are followed by the respiratory prescribing indicator, listed separately because it reflects treatment in both

COPD and asthma, and smoking cessation, also listed separately because it reflects a prevention and treatment intervention common to all respiratory conditions.

Data sources

Data for most of the indicators in the Respiratory Disease Atlas have been extracted by colleagues in the Department of Health, the East of England Public Health Observatory (ERPHO), the Child and Maternal Health Observatory (ChiMat), the Prescribing Support and Primary Care Team at the NHS Information Centre, NHS Improvement – Lung, and Solutions for Public Health (SPH) from a variety of sources including:

- › The Quality Management and Analysis System;
- › Hospital Episode Statistics (HES);
- › The Office for National Statistics mid-year population estimates;
- › The Office for National Statistics mortality records;
- › NHS Comparators;
- › IC indicators portal;
- › DH Waiting Times and Activity Data Set;
- › NHS Stop Smoking returns;
- › electronic Prescribing Analysis and CosT tool (ePACT) system.

Classification

Data for each of the indicators are displayed as both a column chart and map to show variation in terms of magnitude and geographical location within England. London is shown as a page inset on all PCT maps to keep detail that otherwise might be lost.

The charts and maps for all indicators are colour classified into thematic displays, which group the indicator values into categories and allow the reader to view and compare them on the column chart and map without having to refer to individual values. Data are displayed on the maps as geographical areas (PCTs).

A simple method of classification using equal counts of geographical areas was used to display all indicators, regardless of distribution of data within indicators. Five equal counts of areas or 'quintiles' were classified for all indicator data where possible. However, as most of the indicators include a total number of areas that are not divisible by five (e.g. 151 PCTs), in most cases the classifications do not include exactly the same number of areas. The method used to create the classification was to rank order the areas from highest to lowest values, then divide the ranks into five equal categories. However, in some cases, indicators included tied ranks (i.e. where some area values were exactly the same) and no areas were split into different categories where the rank was equal; this meant that an equal split was not possible in these cases. For the few indicators where there were many tied ranks of equal data, the split between categories was adjusted to ensure a 'best fit' of equal numbers, without splitting areas with the same values.

The disadvantage with equal counts of data is that it does not take into account the distribution of the data, and categories can be created with very different ranges of variation between the highest and lowest values. This should be taken into consideration when comparing areas in different categories within indicators.

The classification is shaded from light amber (lowest value) to dark amber (highest value) on both the column charts and maps. The ranges and their shading do not indicate whether a high or low value represents either good or poor performance.

The charts have been originally produced in Microsoft Excel 2007 and the maps originally created using MapInfo Professional 10.5.

Exception-reporting

There are four indicators from the Quality and Outcomes Framework (QOF) in the Respiratory Disease Atlas: COPD 10, 13 and 8, and Asthma 6. Under the QOF scheme, GPs are rewarded for achieving an agreed level of population coverage for each indicator. The level of achievement recorded depends on the GP practice treating the patients with the relevant problem. However, not all patients are treatable or willing to be treated, e.g. when patients do not attend for review despite repeated invitations, or if a medication cannot be prescribed due to a contra-indication or side-effect. In calculating coverage, practices are allowed to exclude or "except" appropriate patients from the target population to avoid being penalised due to factors beyond the practices' control. Exception-reporting is

allowed for a range of reasons. The QOF achievement that is reported annually is the exception-adjusted population coverage.

- In Maps 2–4, the maps and the coloured columns in the charts show the **actual** population coverage for each PCT in which excepted patients have been **included** in the denominator, whereas the open columns show the published **QOF achievement**, which does **not include** excepted patients in the denominator.
- In Map 12, the map and chart show only the QOF achievement, i.e. the exception-adjusted population coverage.

Standardisation

Standardisation allows like to be compared with like, by making sure that differences in the number of events (e.g. deaths or infections) observed in two or more populations are not due to differences in the age and sex profile between the different populations. (For example, suppose population A has a higher death rate than population B. However, if population A also has a higher proportion of older people, then we would expect there to be more deaths and it would be misleading to infer that people are dying at a faster rate in population A than in population B.) The two main methods of standardisation are:

- directly standardised rates;
- indirectly standardised rates.

Directly standardised rates adjust for differences in age and sex distribution by applying the observed rates (e.g. of disease) for each age-band in the study area (e.g. the PCT) to a standard population structure (in this case, the European Standard population) to obtain a weighted average rate. Direct standardisation has been used for the indicators in Maps 5, 10, and 13–15.

Indirectly standardised rates adjust for the differences in age and sex distribution by applying the observed rates for each age-band/gender in a standard population (in this case, England) to the population of the same age-groups in the study area (e.g. the PCT). Indirect standardisation has been used for the indicator in Map 9.

Confidence intervals

Some of the indicators (Maps 6, 9, 10, 13–15, 17 and 20) have error terms associated with them, referred to as confidence intervals, to give an indication of the level

of uncertainty of the calculation. Statistical uncertainties usually arise because the indicators are based on a random sample of finite size from a population of interest. Confidence intervals are used to assess what would happen if we were to repeat the same study, over and over, using different samples each time. The precise statistical definition of a 95% confidence interval states that, on repeated sampling, 95 times out of 100 the true population value would be within the calculated confidence interval range and for 5 times out of 100 the true value would be either higher or lower than the range. Where these confidence intervals have been calculated for indicators in the Respiratory Disease Atlas, they are displayed on the relevant charts as a vertical line intersecting the top of each column. The smaller the confidence interval, the more stable the indicator; a larger number of events leads to a smaller interval.

Association with deprivation

The association between the indicators in Maps 14 and 17 and the level of deprivation (Indices of Multiple Deprivation 2010) was assessed using Pearson's Product Moment correlation coefficient, which gives a score of between 0 and +/-1.

- A correlation coefficient of 0 indicates that there is no association between the level of deprivation and the indicator at PCT level;
- A correlation coefficient of +1 indicates that the PCT with the highest level of deprivation has the highest score on the indicator, the PCT with the second highest level of deprivation has the second highest score on the indicator, and so on.
- A correlation coefficient of -1 indicates that the PCT with the highest level of deprivation has the lowest score on the indicator, the PCT with the second highest level of deprivation has the second lowest score on the indicator, and so on.

In the Respiratory Disease Atlas, the strength of correlation has been described consistently according to the terms set out in Table M.1.

Table M.1: Strength of correlation¹

Value of correlation coefficient, <i>r</i>	Description
0.0–0.2	Weak/slight
0.2–0.4	Mild/modest
0.4–0.6	Moderate
0.6–0.8	Moderately strong
0.8–1.0	Strong

Exclusions

For all of the indicators mapped to PCT geography, the calculation of the full range of variation is given in the accompanying commentaries; in addition, the range has then been calculated from which the five highest values and the five lowest values have been excluded. This is because "outliers" could be the result of errors in data management, e.g. some data may not have been returned or events may have been recorded twice. This exclusion was originally suggested by Professor Sir Mike Richards for Atlas 1.0, and Right Care has continued to use the "Richards heuristic" in Atlas 2.0, the Child Health Atlas, the Kidney Care Atlas and the Respiratory Disease Atlas.

Domains in the NHS Outcomes Framework

Underneath the title for each indicator, the domain or domains in the NHS Outcomes Framework 2012/13 relevant to the indicator have been listed. The five domains are as follows:

- Domain 1 Preventing people from dying prematurely
- Domain 2 Enhancing quality of life for people with long-term conditions
- Domain 3 Helping people to recover from episodes of ill health or following injury
- Domain 4 Ensuring that people have a positive experience of care
- Domain 5 Treating and caring for people in a safe environment and protecting them from avoidable harm

¹ University of Washington. <http://faculty.washington.edu/ddbrewer/s231/s231regr.htm>

Table S.1: Summary of indicators in the Respiratory Disease Atlas, showing the range and magnitude of variation before and after exclusions; each indicator has been assigned to one or more of the following categories – activity, cost, equity, outcome, quality (performance as compared with a standard), and safety.

Map no.	Title	Range	Fold difference	Range after exclusions	Fold difference after exclusions	Category of indicator
1	Ratio of reported to expected COPD prevalence by PCT 2010/11	0.26–1.1	4.1	0.31–1.0	3.1	Quality
2	Percentage of patients with COPD with a record of FEV ₁ in the previous 15 months by PCT (QOF COPD 10 with exception-reported patients included) 2010/11	65.8–86.6	1.3	72.9–83.8	1.2	Quality
3	Percentage of patients with COPD who have had a review in the preceding 15 months by PCT (QOF COPD 13 with exception-reported patients included) 2010/11	71.6–87.3	1.2	77.4–85.9	1.1	Quality
4	Percentage of patients with COPD who have had influenza immunisation in the preceding 1 September to 31 March by PCT (QOF COPD 8 with exception-reported patients included) 2010/11	75.8–85.2	1.1	76.9–83.7	1.1	Quality
5	Rate of COPD emergency admissions to hospital per 100,000 population by PCT 2010/11	76.9–421.6	5	87.6–340.5	3.9	Quality
6	Percentage of COPD emergency re-admissions to hospital within 30 days of discharge by PCT 2010/11	6.9–22.4	3.3	9.1–18.1	2.0	Quality and Outcome
7	Proportion (%) of patients admitted with COPD receiving non-invasive ventilation (NIV) by PCT 2010/11	1.8–13.3	7	2.5–11.2	4.4	Quality
8	Rate of expenditure (£) on home oxygen therapy per 1000 population by PCT 2010/11	1039–7422	7	1245–4721	3.8	Cost
9	Rate of deaths per 100,000 population within 30 days of an admission for COPD by PCT 2009/10	3404.6–11,826.1	3.5	4237.5–10,119.0	2.4	Outcome
10	Rate of COPD mortality per 100,000 population by PCT 2008–2010	14.5–51.1	3.5	16.3–44.7	2.7	Outcome

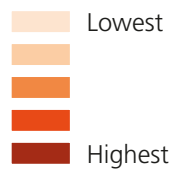
Map no.	Title	Range	Fold difference	Range after exclusions	Fold difference after exclusions	Category of indicator
11	Prevalence (%) of asthma recorded on GP registers by PCT 2010/11	3.5–7.1	2.0	4.4–6.9	1.6	Activity and Quality
12	Percentage of patients with asthma who have had an asthma review in the previous 15 months by PCT (QOF Asthma 6) 2010/11	75.2–86.6	1.2	76.1–82.4	1.1	Quality
13	Rate of emergency admissions to hospital in people aged 18 years and over with asthma per 100,000 population by PCT 2010/11	30.1–193.0	6	37.6–121.6	3.2	Quality
14	Emergency admission rate for children with asthma per 100,000 population aged 0–17 years by PCT 2010/11	38.7–732.6	19	92.9–487.4	5	Quality
15	Rate of pneumonia mortality in people aged under 75 years per 100,000 population by PCT 2007–2010	2.6–22.3	9	3.7–11.1	3.0	Outcome
16	Rate of sleep studies undertaken per 1000 population by PCT 2011	0.2–8.6	57	0.3–6.2	24	Activity
17	Rate of admissions for bronchiolitis in children per 100,000 population aged under 2 years by PCT 2008/09–2010/11	369.7–5500.4	15	784.2–4081.4	5	Activity and Quality
18	Mean length of stay (days) for bronchiolitis in children aged under 2 years by PCT 2008/09–2010/11	0.6–4.1	7	1.2–3.1	2.6	Cost and Quality
19	Average daily quantity (ADQ) of combination (ICS and LABA) inhalers per 1000 patients on GP COPD and Asthma registers by PCT 2011	51,954.0–167,258.6	3.2	73,260.3–141,695.0	1.9	Activity
20	Rate of successful smoking quitters at 4 weeks per 100,000 smokers aged 16 years and over by PCT 2010/11	2253.3–8779.1	3.9	2811.7–6447.9	2.3	Outcome

CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD)

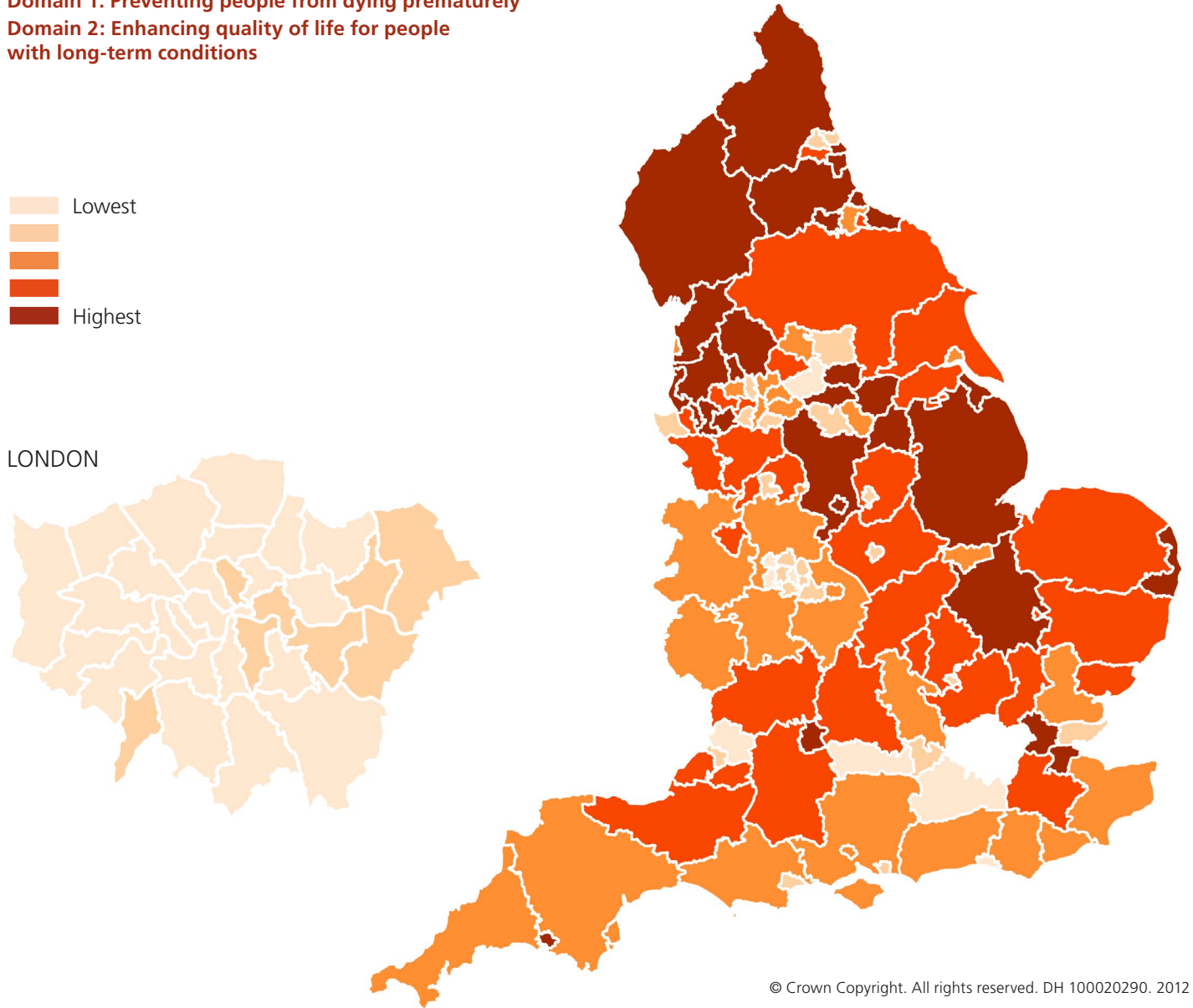
Map 1: Ratio of reported to expected COPD prevalence by PCT

2010/11

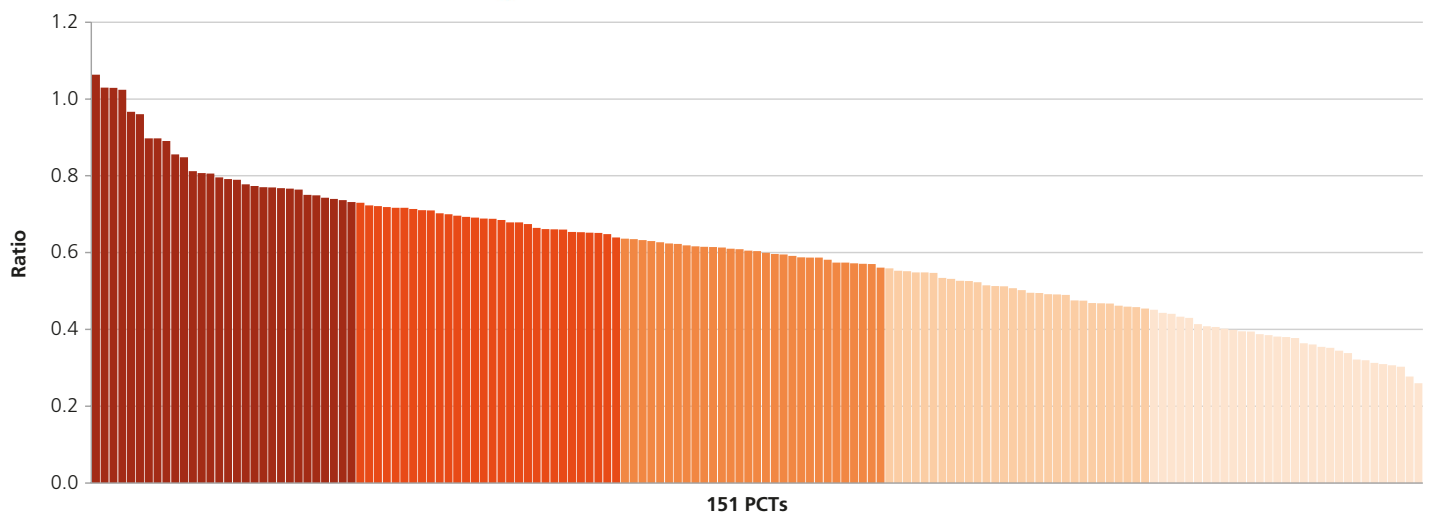
Domain 1: Preventing people from dying prematurely
Domain 2: Enhancing quality of life for people with long-term conditions



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Context

Most people with COPD are unaware they have the condition. Around 835,000 people in England are currently diagnosed with COPD and a further 2.2 million are undiagnosed. Failure to diagnose is not confined to people with very mild disease: more than 50% of people with moderate COPD have not been detected and around 20% of undiagnosed people have severe or very severe disease. In a national audit in 2008, it was found that 10% of people who were sufficiently ill with their COPD to require admission to hospital had not been diagnosed.

Late diagnosis matters to patients with COPD:

- acute exacerbations are common even in moderate disease;
- lung function declines progressively and the rate of decline is faster in the earlier stages of COPD;
- symptoms have a major impact on quality of life and physical and social activity;
- treatment makes a difference to symptom control, and disease impact and outcomes.

Many patients are also incorrectly diagnosed with COPD when they have another condition. As a consequence, they may receive inadequate, inappropriate and often expensive treatment.

There are several reasons for the high level of late and inaccurate diagnosis.

- People often do not recognise the symptoms of COPD because they develop gradually.
- Many people believe it is normal to have a cough and be short of breath, think the symptoms are due to age or smoking and that nothing can be done.
- When patients present, doctors often treat the symptoms but do not investigate the underlying lung disease.
- Spirometry, the key diagnostic test, is often performed and interpreted inaccurately.

The indicator shows the proportion of the estimated total COPD population that has been diagnosed, calculated by dividing the COPD prevalence recorded for the Quality and Outcomes Framework (QOF) by the expected prevalence obtained from the APHO-modelled estimate¹ for each PCT.

Magnitude of variation

For PCTs in England, the ratio of reported to expected COPD prevalence ranged from 0.26–1.1 (4.1-fold variation). When the five PCTs with the highest ratios and the five PCTs with the lowest ratios are excluded, the range is 0.31–1.0, and the variation is 3.1-fold.

This degree of variation shows that:

- some PCTs and practices are much more efficient than others in detecting COPD;
- there is considerable capacity for improvement.

Options for action

To improve the timeliness and accuracy of diagnosis of COPD, commissioners and clinicians need to implement the steps in Box 1.1. Earlier diagnosis of people with airflow obstruction and significant symptoms would improve quality of life and outcomes such as exacerbation rate and emergency admission.

Box 1.1: Improving the timeliness and accuracy of diagnosis of COPD

- Quality-assured diagnostic spirometry: Ensure that diagnostic spirometry is performed only by professionals with the appropriate training, competencies and equipment; standards are clearly defined and equally applicable to primary, community and secondary care settings
- Systematic targeted case-finding: Audit GP patient registers to identify undiagnosed but symptomatic patients with airflow obstruction, e.g. smokers and ex-smokers not known to have COPD or asthma with a history of recurrent respiratory symptoms, infections, or treatment with inhalers
- Public health campaigns: Promote lung health and early recognition of the symptoms of COPD

See Case-study 1, page 61.

RESOURCES

- Department of Health (2011) An outcomes strategy for people with chronic obstructive pulmonary disease (COPD) and Asthma in England. http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_127974
- Department of Health (2012) An Outcomes Strategy for COPD and Asthma: NHS Companion Document. http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_134000
- NHS Medical Directorate (2012) COPD Commissioning Toolkit. A Resource for Commissioners. <https://www.wp.dh.gov.uk/publications/files/2012/08/chronic-obstructive-pulmonary-disease-COPD-commissioning-toolkit.pdf>
- Guide to Performing Quality Assured Diagnostic Spirometry (to be published)
- NHS Improvement – Lung. COPD Toolkit. Listen to your lungs. <http://www.improvement.nhs.uk/lung/LinkClick.aspx?fileticket=po5wWd-LFuk%3D&tabid=162>
- Quality Intelligence East. INHALE – Interactive Health Atlas for Lung conditions in England. <http://www.inhale.nhs.uk/>

1 COPD Prevalence estimates Dec 2011. <http://www.apho.org.uk/resource/item.aspx?RID=111122>

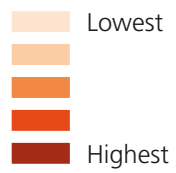
Walford H, Ramsay L (2011) COPD Prevalence Modelling Briefing Document. <http://www.apho.org.uk/resource/item.aspx?RID=111137>

CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD)

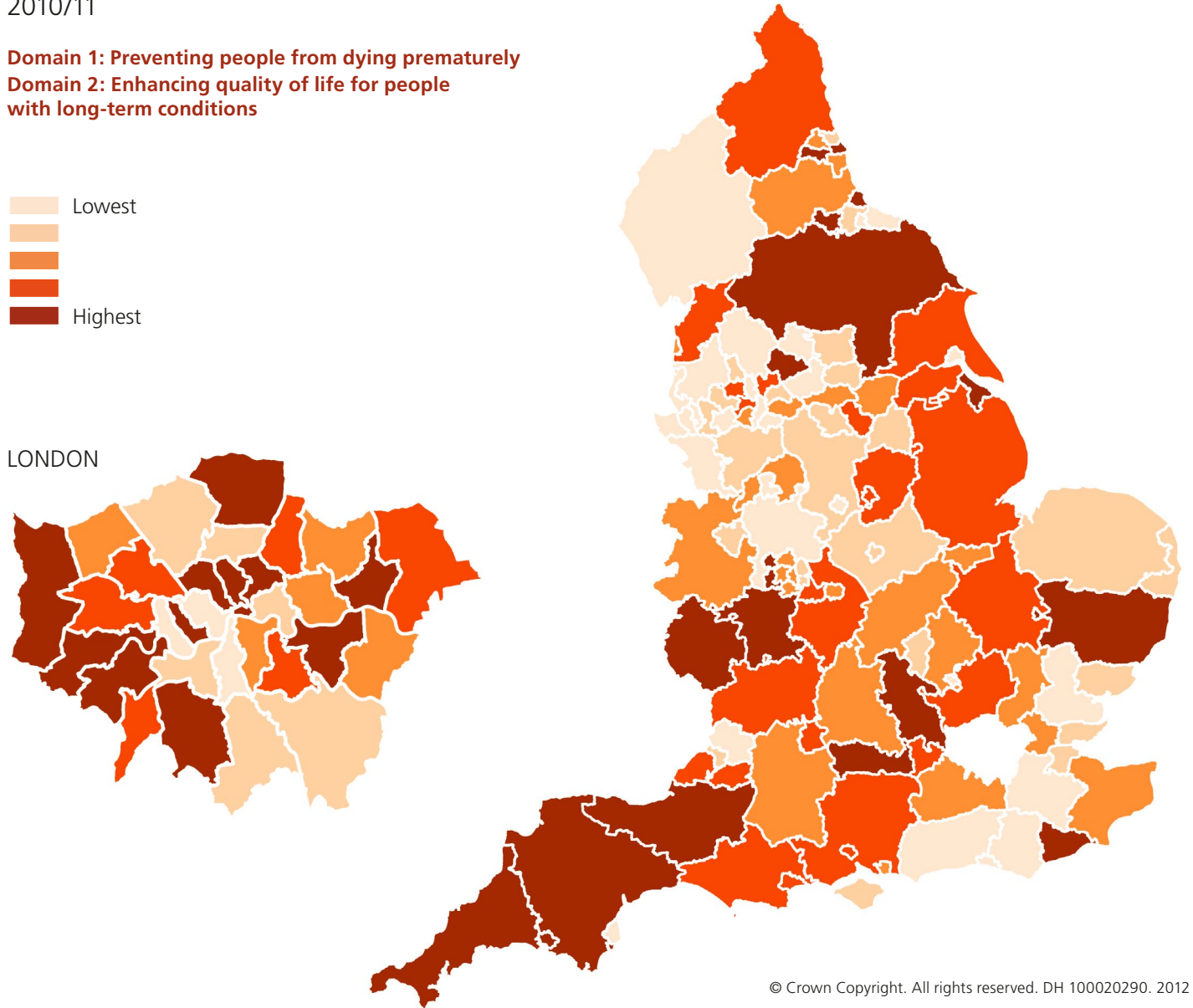
Map 2: Percentage of patients with COPD with a record of FEV₁ in the previous 15 months by PCT (QOF COPD 10 with exception-reported patients included)

2010/11

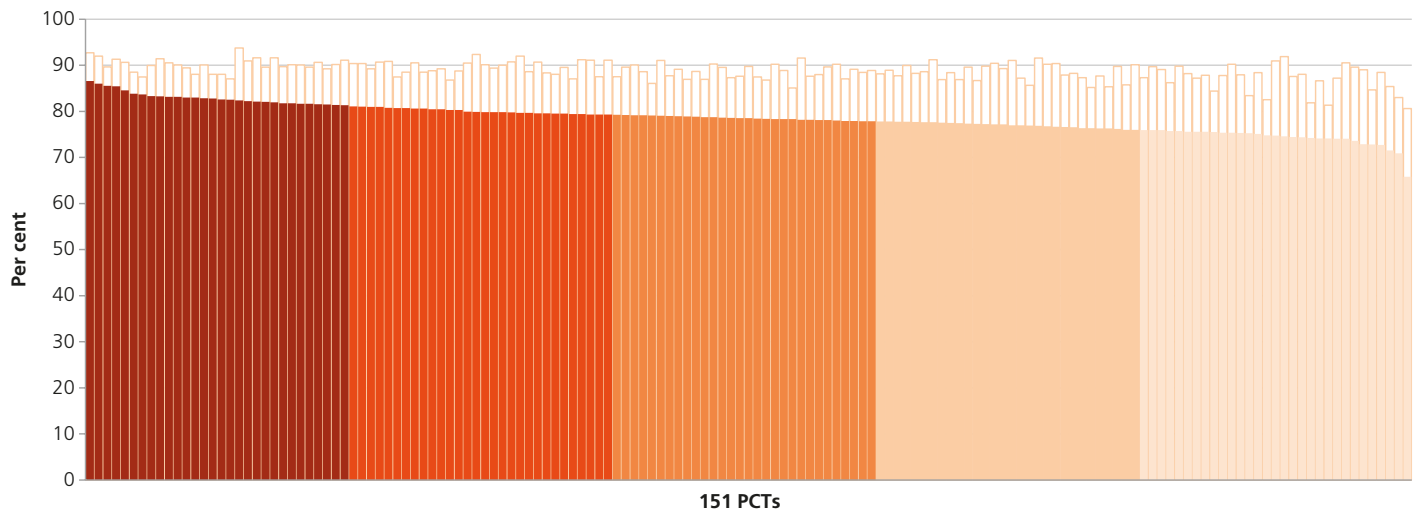
Domain 1: Preventing people from dying prematurely
Domain 2: Enhancing quality of life for people with long-term conditions



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Context

Most of the care for people with COPD is provided in the primary care sector. The chronic disease management delivered by GPs and nurses is likely to have a considerable impact on patient outcomes such as symptom control, quality of life, physical and social activity, admission to hospital, and mortality.

The Quality and Outcomes Framework (QOF) indicators - COPD 10, 13 and 8 – reflect the chronic disease management of COPD in primary 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 except appropriate patients from the target population to avoid being penalised for factors beyond the GPs’ control, e.g. when patients do not attend for review despite repeated invitations, or if a medication cannot be prescribed due to a contra-indication or side-effect. It is this exception-adjusted population coverage that is reported annually.

However, patients not seen for review are at high risk of not receiving appropriate pro-active chronic disease management and therefore of experiencing worse outcomes than patients who do receive a review.

For these three COPD indicators, QOF data have been used. However, the maps and the coloured columns in the charts show the actual population coverage for each PCT in which excepted patients have been included in the denominator, whereas the open columns show the published QOF achievement, which does not include excepted patients in the denominator.

Magnitude of variation (See table below)

Although there are legitimate reasons for exception-reporting, the column charts for Maps 2–4 show that the difference between the published QOF achievement and actual coverage varies substantially at PCT level. Within PCTs, the degree of variation in exception-reporting among practices tends to be much greater. This suggests that some practices are more effective than others at reaching the local COPD population and thereby at influencing patient outcomes.

Options for action

Actual population coverage for systematic chronic disease management in people with COPD is lower than the published QOF achievement suggests. It is possible that many of the people not attending for regular review are among the high-risk patients in whom control is poor. Novel and creative strategies are necessary to reach patients previously not reached in order to optimise their COPD control. To increase local population coverage of chronic disease management

in COPD, commissioners could consider the interventions in Box 2.1 and help more local practices to become effective at reaching the entire local population with COPD through regular review.

Box 2.1: Increasing local population coverage of chronic disease management in COPD

- Calculate the actual chronic disease management coverage of registered COPD patients by including excepted patients in the denominator
- Benchmark and share local exception-reporting data
- Identify the systems to maximise patient-reach used in the best-performing practices
- Support local practices with high exception rates to implement best-practice systems and improve patient outcomes through systematic chronic disease management

See Case-study 2, page 62.

RESOURCES

- Department of Health (2011) An outcomes strategy for people with chronic obstructive pulmonary disease (COPD) and Asthma in England. http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_127974
- Department of Health (2012) An Outcomes Strategy for COPD and Asthma: NHS Companion Document. http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_134000
- NHS Medical Directorate (2012) COPD Commissioning Toolkit. A Resource for Commissioners. <https://www.wp.dh.gov.uk/publications/files/2012/08/chronic-obstructive-pulmonary-disease-COPD-commissioning-toolkit.pdf>
- Quality Intelligence East. INHALE – Interactive Health Atlas for Lung conditions in England. <http://www.inhale.nhs.uk/>
- NICE Guidance (2010) Chronic obstructive pulmonary disease (updated) (CG101) Management of chronic obstructive pulmonary disease in adults in primary and secondary care. <http://guidance.nice.org.uk/CG101>
- NICE (2011) Chronic obstructive pulmonary disease quality standard. <http://www.nice.org.uk/guidance/qualitystandards/chronicobstructivepulmonarydisease/copdqualitystandard.jsp>
- The Primary Care Respiratory Society. <http://www.pcrs-uk.org/>

			Range	Fold difference	Applying “Richards heuristic” ¹	
					Range	Fold difference
Map 2, page 24	Percentage of patients with COPD with a recordw of FEV ₁ in the previous 15 months by PCT 2010/11	Actual coverage	65.8–86.6%	1.3	72.9–83.8%	1.2
		Published QOF achievement	80.6–93.7%	1.2	83.4–91.9%	1.1
Map 3, page 26	Percentage of patients with COPD who have had a review in the preceding 15 months by PCT 2010/11	Actual coverage	71.6–87.3%	1.2	77.4–85.9%	1.1
		Published QOF achievement	85.9–94.2%	1.1	88.4–93.7%	1.1
Map 4, page 27	Percentage of patients with COPD who have had a review in the preceding 15 months by PCT 2010/11	Actual coverage	75.8–85.2%	1.1	76.9–83.7%	1.1
		Published QOF achievement	88.9–95.4%	1.1	91.1–94.7%	1.0

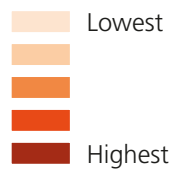
1 In the “Richards heuristic”, the five PCTs with the highest percentages and the five PCTs with the lowest percentages are excluded (see “Map and chart presentation”, page 19).

CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD)

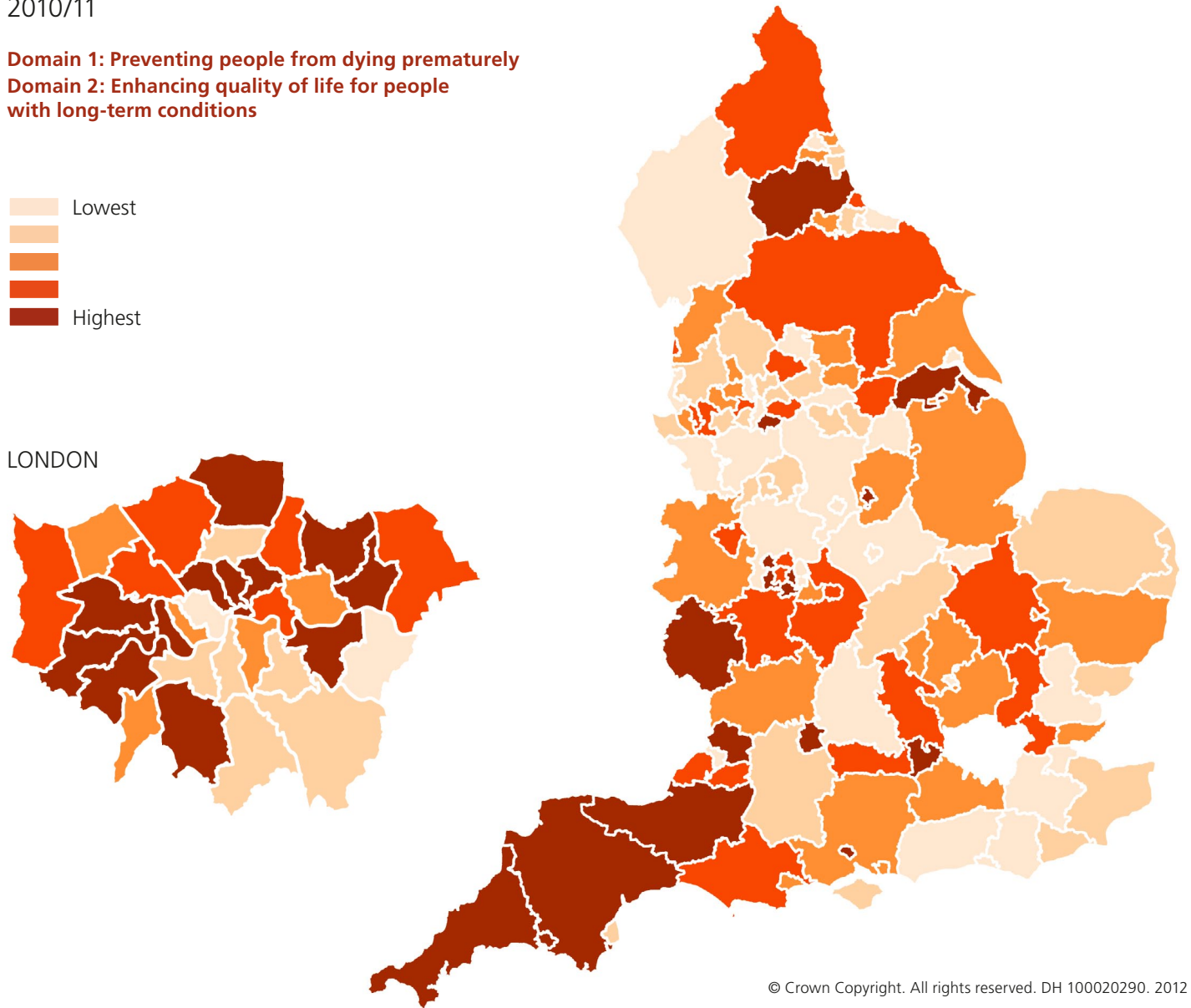
Map 3: Percentage of patients with COPD who have had a review in the preceding 15 months by PCT (QOF COPD 13 with exception-reported patients included)

2010/11

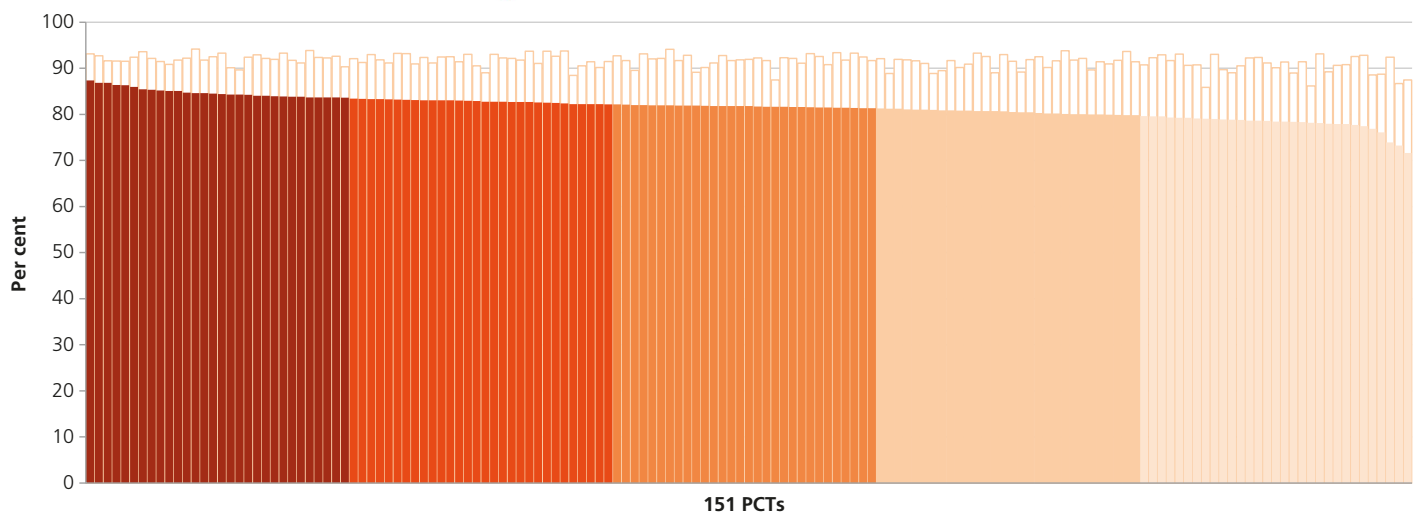
Domain 1: Preventing people from dying prematurely
Domain 2: Enhancing quality of life for people with long-term conditions



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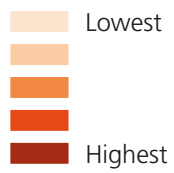


CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD)

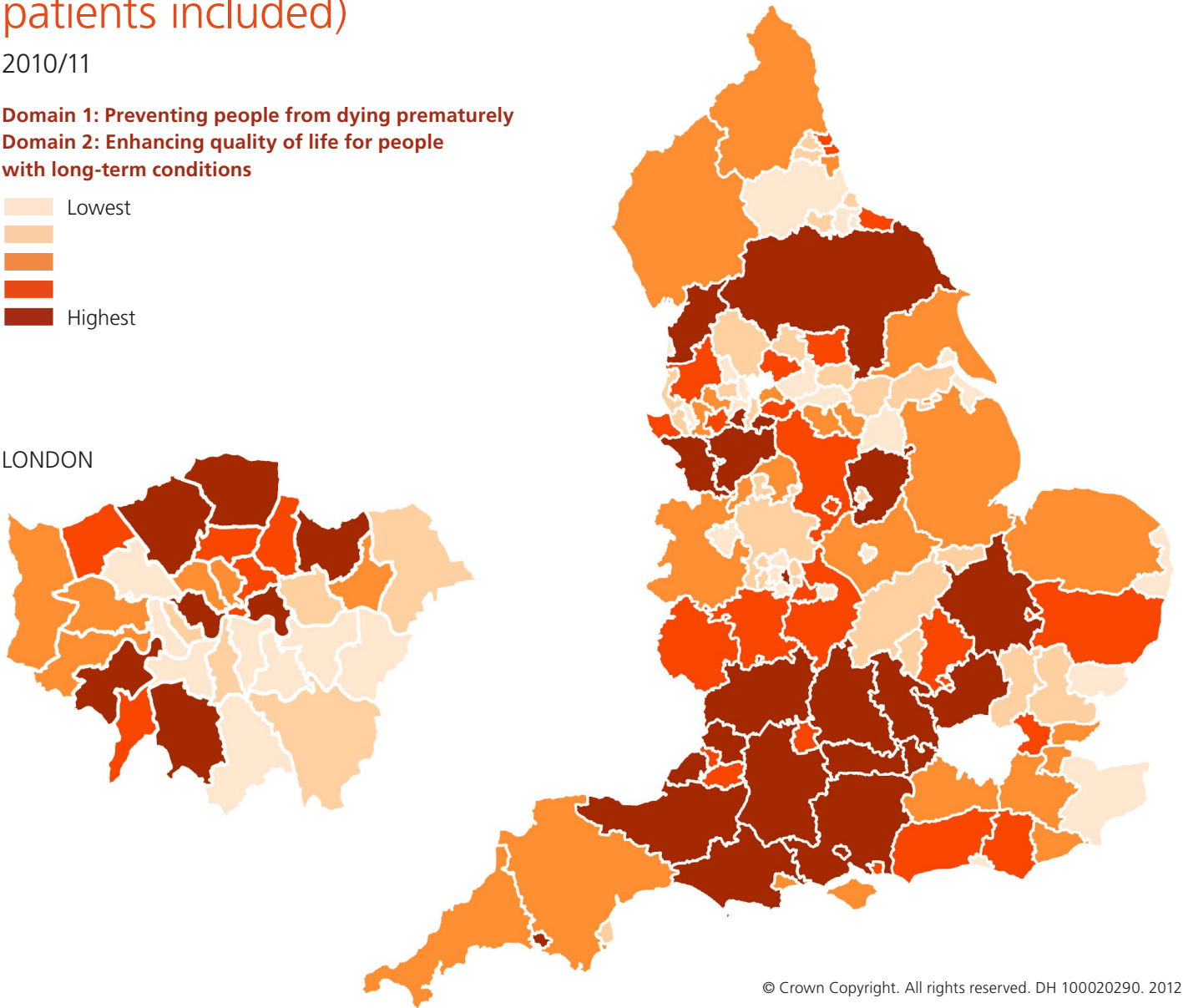
Map 4: Percentage of patients with COPD who have had influenza immunisation in the preceding 1 September to 31 March by PCT (QOF COPD 8 with exception-reported patients included)

2010/11

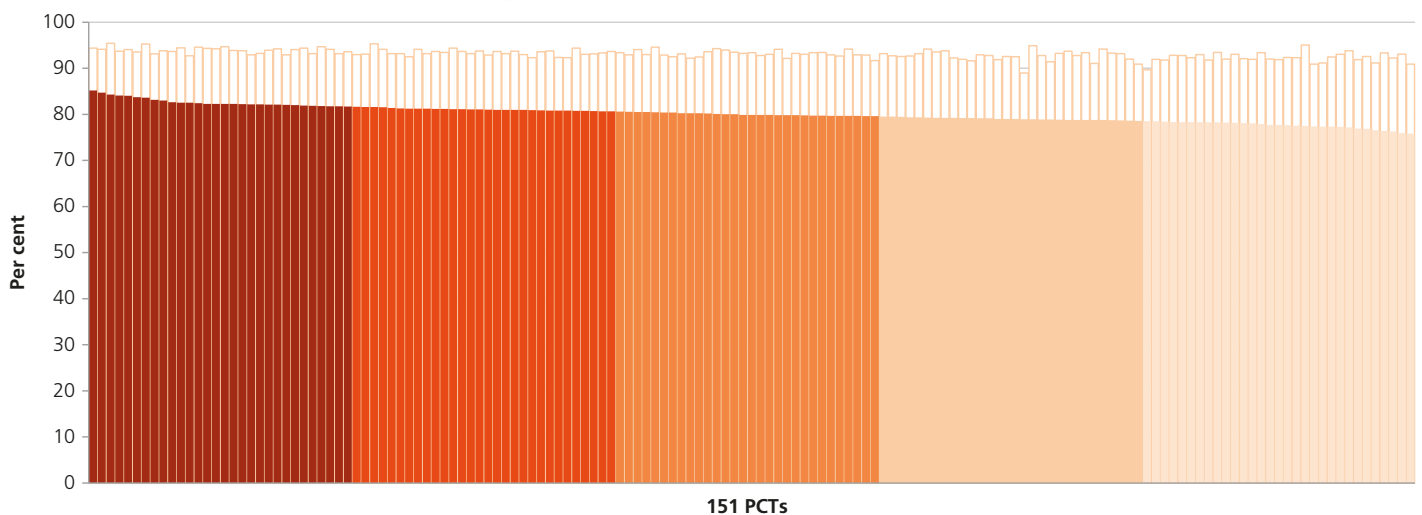
Domain 1: Preventing people from dying prematurely
 Domain 2: Enhancing quality of life for people with long-term conditions



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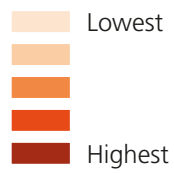


CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD)

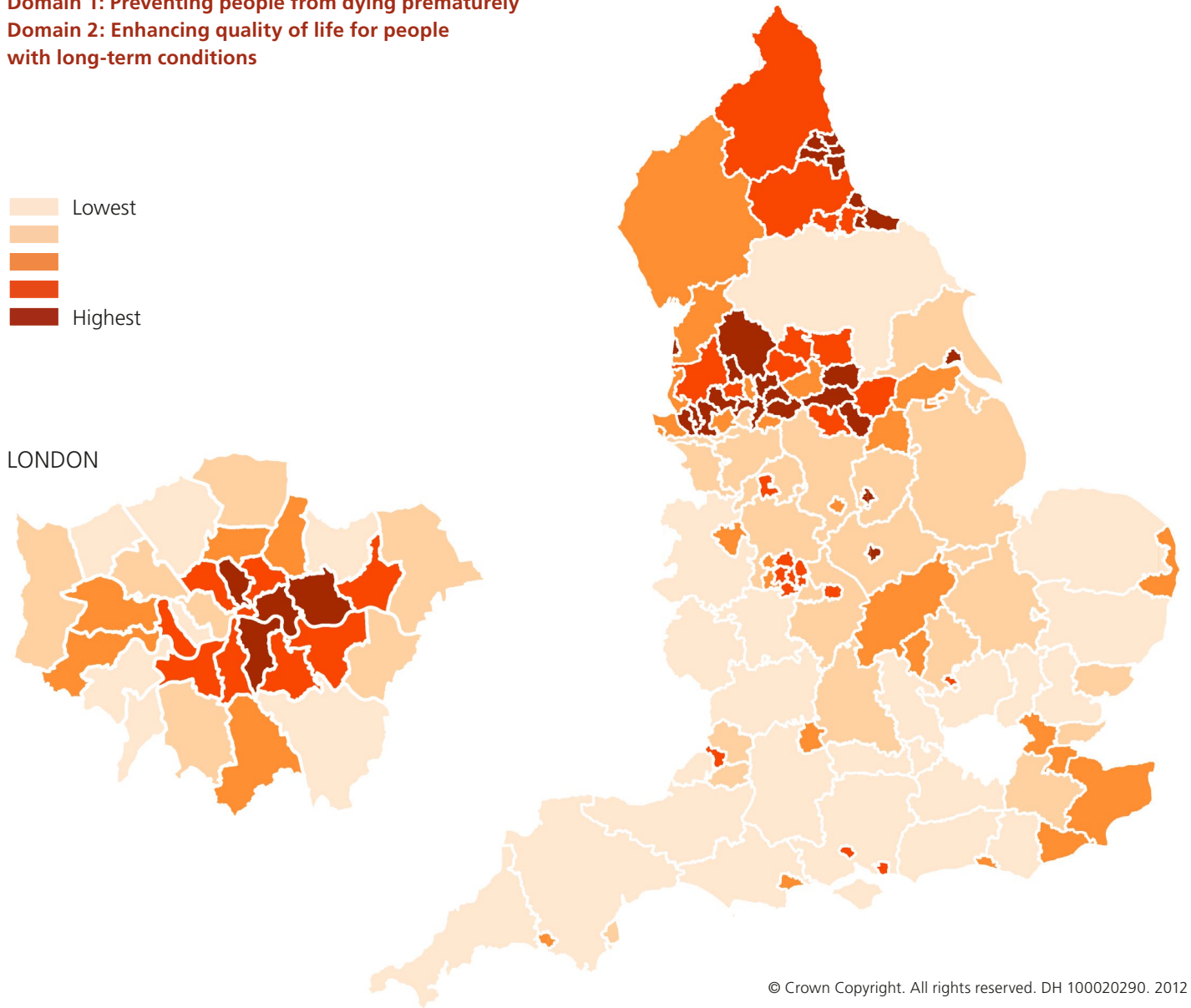
Map 5: Rate of COPD emergency admissions to hospital per population by PCT

Directly standardised rate 2010/11

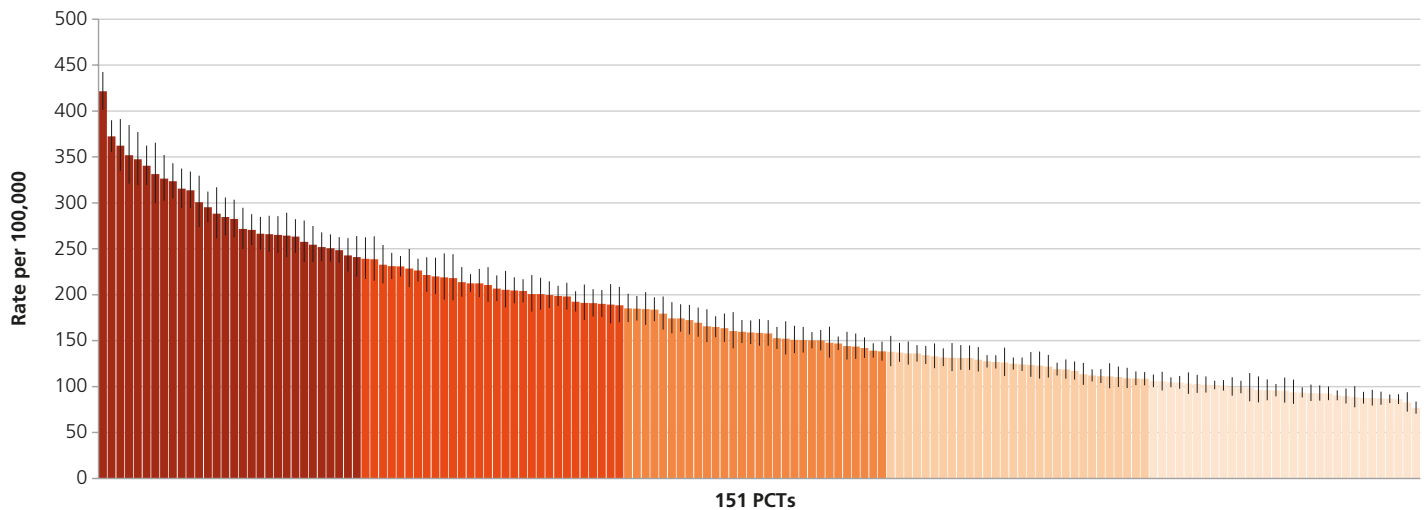
Domain 1: Preventing people from dying prematurely
Domain 2: Enhancing quality of life for people with long-term conditions



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Context

COPD is one of the main causes of preventable death and disability. In England, more than 3 million people are estimated to suffer from COPD, but only around 835,000 have been diagnosed.

People with COPD experience recurrent flare-ups or exacerbations which need more intensive treatment, and some of which can be severe enough to require hospital admission. Indeed, COPD is the second most common reason for emergency admission to hospital, accounting for one in eight non-elective admissions. It is therefore costly for the NHS.

In England, COPD kills about 23,000 people a year. Mortality is high in patients who are hospitalised: one in twelve will die during an emergency admission; one in six will die within 3 months.

Admission to hospital is a major adverse outcome for patients, which places considerable demands on NHS resources.

Magnitude of variation

For PCTs in England, the rate of COPD emergency admissions to hospital ranged from 76.9 to 421.6 per 100,000 population (5-fold variation). When the five PCTs with the highest rates and the five PCTs with the lowest rates are excluded, the range is 87.6–340.5 per 100,000 population, and the variation is 3.9-fold.

Thus, for people with COPD, the risk of being admitted with an acute exacerbation can vary nearly four times depending on where they live.

Following internal analysis at the Department of Health, similar patterns were seen when comparing PCTs with similar populations and similar levels of deprivation.

The degree of variation observed shows that in many localities there is substantial scope for reducing emergency admissions. Action to prevent emergency admissions could not only improve outcomes for patients but also save money because expenditure on COPD admissions is high in every PCT.

Options for action

It is likely that in PCTs in which there are lower emergency admission rates commissioners work with providers to ensure the provision of pro-active clinical care and alternatives to admission (see Box 5.1).

See Case-study 3, page 63.

Box 5.1: Pro-active clinical care and alternatives to admission for patients with COPD

1. Review of admissions among primary and secondary care providers to identify people experiencing frequent exacerbations who need more pro-active management
2. Early discharge schemes and hospital-at-home services to support evidence-based avoidance of admissions
3. Pro-active chronic disease management in primary and community care, including clear action plans, optimisation of therapy and support for patient self-management with home provision of standby medication, and referral for pulmonary rehabilitation when indicated
4. Prompt support for patients when they develop new or worsening symptoms, with early access to specialist-led integrated care in the community when appropriate

RESOURCES

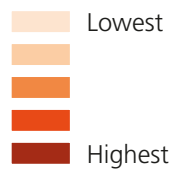
- ▶ Department of Health (2011) An outcomes strategy for people with chronic obstructive pulmonary disease (COPD) and Asthma in England. http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_127974
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- ▶ NHS Medical Directorate (2012) COPD Commissioning Toolkit. A Resource for Commissioners. <https://www.wp.dh.gov.uk/publications/files/2012/08/chronic-obstructive-pulmonary-disease-COPD-commissioning-toolkit.pdf>
- ▶ Quality Intelligence East. INHALE – Interactive Health Atlas for Lung conditions in England. <http://www.inhale.nhs.uk/>
- ▶ NICE Guidance (2010) Chronic obstructive pulmonary disease (updated) (CG101) Management of chronic obstructive pulmonary disease in adults in primary and secondary care. <http://guidance.nice.org.uk/CG101>
- ▶ NICE (2011) Chronic obstructive pulmonary disease quality standard. <http://www.nice.org.uk/guidance/qualitystandards/chronicobstructivepulmonarydisease/copdqualitystandard.jsp>
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- ▶ IMPRESS – Improving and integrating respiratory services. <http://www.impressresp.com/>
- ▶ British Lung Foundation. <http://www.blf.org.uk/Home>

CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD)

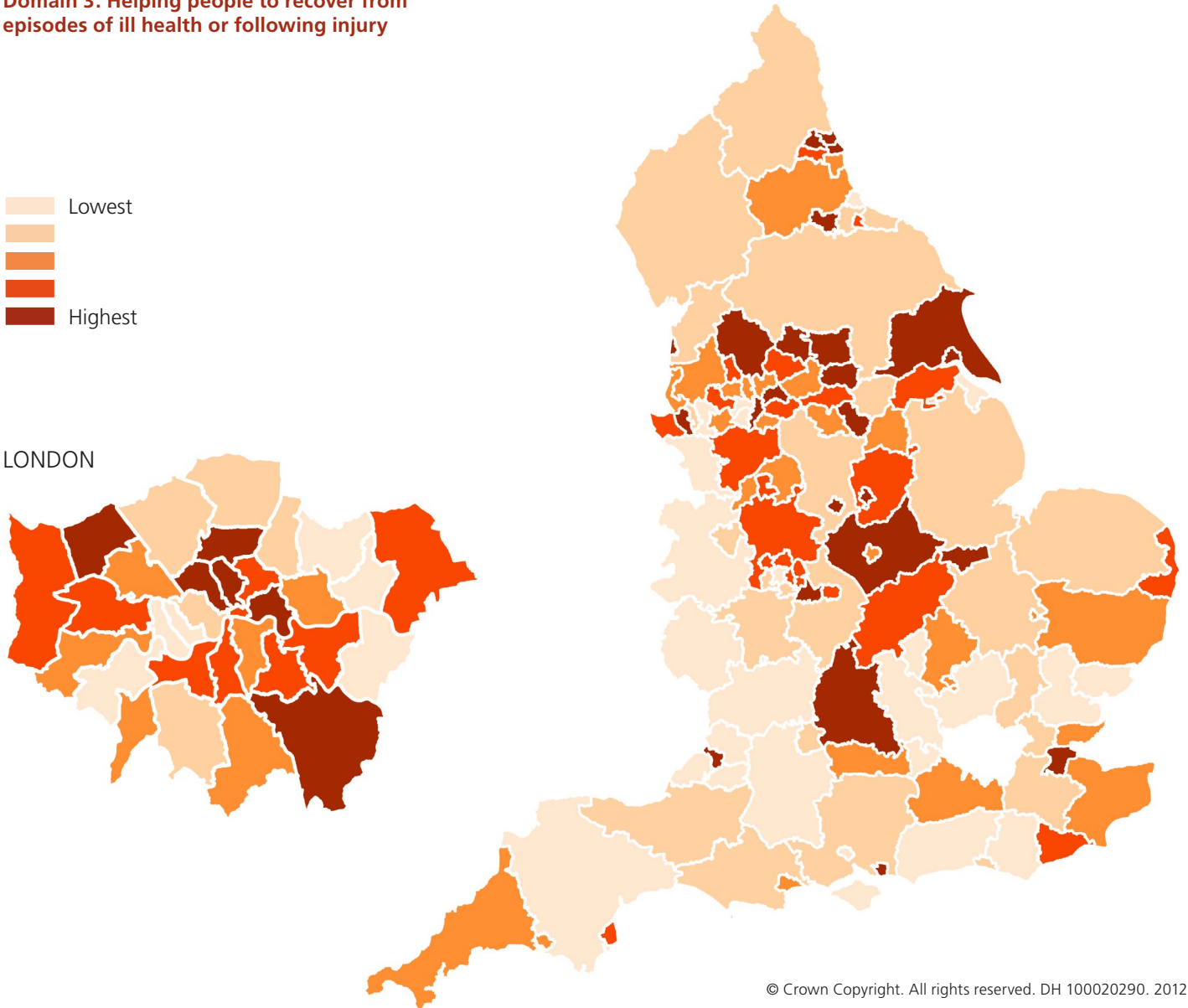
Map 6: Percentage of COPD emergency re-admissions to hospital within 30 days of discharge by PCT

2010/11

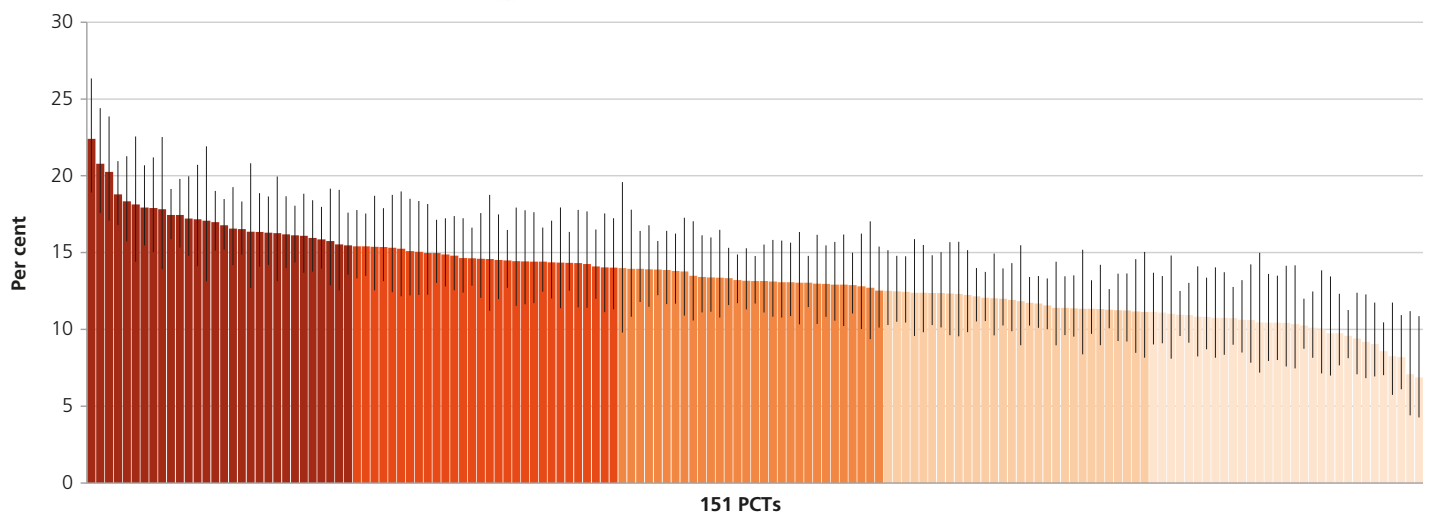
Domain 3: Helping people to recover from episodes of ill health or following injury



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Context

Re-admissions are a substantial problem in the treatment of patients with COPD. Of all emergency re-admissions to hospital, COPD is the fifth most common cause. At any one time, around one-third of all people admitted as an emergency with COPD have been treated in hospital for the same condition within the preceding 30 days.

The majority of re-admissions are for COPD or complications of COPD:

- in 97% of patients, the re-admission is coded as COPD or other respiratory cause;
- in 2%, the re-admission is coded as a cardiac cause.

The condition of COPD has a high mortality, causing 23,000 deaths in England each year. Mortality is particularly high in people who are hospitalised: one in twelve will die during an emergency admission; one in six will die within 3 months.

Admission and re-admission to hospital are major adverse outcomes for patients, which place considerable demands on NHS resources.

Magnitude of variation

For PCTs in England, the percentage of COPD emergency re-admissions to hospital within 30 days of discharge ranges from 6.9% to 22.4% (3.3-fold variation). When the five PCTs with the highest percentages and the five PCTs with the lowest percentages are excluded, the range is 9.1–18.1%, and the variation is 2.0-fold.

Thus, for people discharged from hospital after a COPD exacerbation, the risk of being re-admitted within one month can vary up to two times depending on where they live.

Some emergency re-admissions are necessary and unavoidable:

- a small number will be due to new clinical problems;
- some will result from complications that could not be avoided.

However, the degree of variation observed among PCTs shows that in many localities there is substantial scope for reducing emergency re-admissions. Action to prevent emergency re-admissions could not only improve outcomes for patients but also save money because expenditure on COPD admissions is high in every PCT.

Options for action

The degree of variation observed suggests that many emergency re-admissions could be prevented through better management during the first stay in hospital and better care following discharge.

It is likely that in PCTs in which emergency re-admission rates are lower commissioners and providers work together to ensure that the care provided to patients admitted during a COPD exacerbation is pro-active, integrated and comprehensive (see Box 6.1).

Box 6.1: Pro-active, integrated and comprehensive care for patients during a COPD exacerbation

1. Structured hospital admission
2. Assessment within 24 hours by a respiratory specialist
3. Prompt assessment for and provision of non-invasive ventilation
4. Comprehensive assessment and management of co-morbid conditions
5. Optimisation of medical therapy and support for patient self-management with home provision of standby medication
6. Referral for pulmonary rehabilitation
7. Referral for home oxygen assessment and review if indicated
8. Structured discharge planning
9. Medical and social support on discharge from hospital and integration with primary and community care
10. Post-discharge review within 2 weeks

See Case-study 4, page 64.

RESOURCES

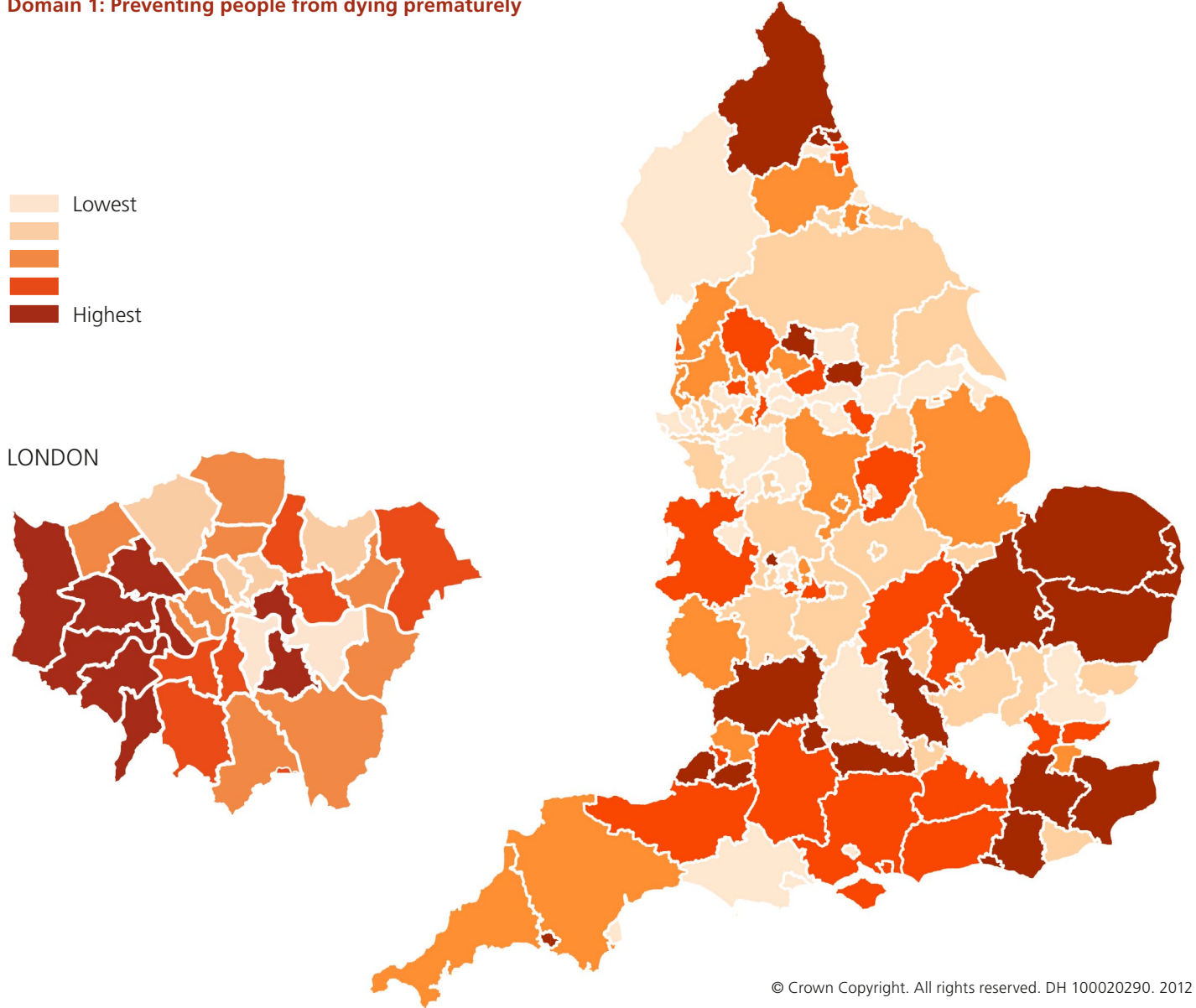
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- Department of Health (2012) An Outcomes Strategy for COPD and Asthma: NHS Companion Document. http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_134000
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- NICE (2011) Chronic obstructive pulmonary disease quality standard. <http://www.nice.org.uk/guidance/qualitystandards/chronicobstructivepulmonarydisease/copdqualitystandard.jsp>
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- IMPRESS – Improving and integrating respiratory services. <http://www.impressresp.com/>
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CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD)

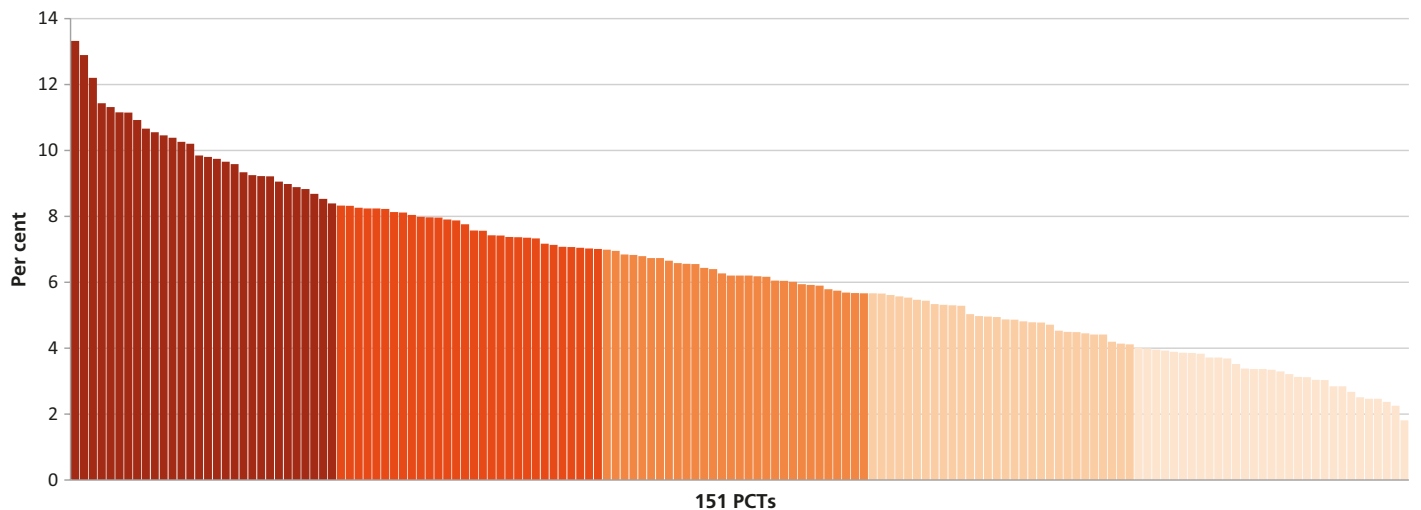
Map 7: Proportion (%) of patients admitted with COPD receiving non-invasive ventilation (NIV) by PCT

2010/11

Domain 1: Preventing people from dying prematurely



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Context

Acute exacerbation of COPD is one of the commonest reasons for hospital admission and is associated with high mortality in hospital, especially if the patient is admitted with acute type 2 respiratory failure (increased levels of carbon dioxide with acidosis). In patients with a pH of 7.35 or less, mortality is 10%; as the pH drops further, the mortality rate rises.

Beyond treating the underlying infection and clearing sputum, supporting ventilation to reduce the carbon dioxide levels is essential. Chemical stimulants for the respiratory centre have a limited role. Ventilatory support techniques are the preferred option.

- Invasive ventilation is very effective, but there is often limited access to intensive care beds and the patient is at risk of developing ventilator-associated pneumonia; furthermore, choosing the right patient for invasive ventilatory support can be difficult.
- Non-invasive ventilation (NIV) is an alternative treatment, in which a snugly fitting mask is used to improve ventilation by providing positive airways pressure.

There is strong evidence to support NIV as the treatment of choice. In a Cochrane systematic review and meta-analysis, the survival benefit of NIV in the management of acute type 2 respiratory failure was confirmed: the number needed to treat (NNT) is only eight to avoid one death.¹

Magnitude of variation

For PCTs in England, the proportion of patients admitted with COPD receiving NIV ranged from 1.8% to 13.3% (7-fold variation). When the five PCTs with the highest percentages and the five PCTs with the lowest percentages are excluded, the range is 2.5–11.2%, and the variation is 4.4-fold.

In the 2008 National COPD audit, 97% of acute hospitals reported that they offered NIV.² However, the degree of variation in the provision of NIV across the country is considerable: a patient's chance of receiving this life-saving treatment can differ substantially depending on where they live.

The pattern of geographical variation observed suggests that it cannot be explained by:

- differences in population density;
- distance from acute hospitals.

The most likely explanations for the differences in patient experience and the discrepancy with the 2008 audit data are:

- lack of 24-hour service provision in some units;
- errors in coding for NIV.

Options for action

Given the improved survival associated with NIV, it needs to be made available to all patients admitted with acute type 2 respiratory failure. To reduce unwarranted variation in NIV provision, commissioners and providers could consider the interventions in Box 7.1.

Box 7.1: Reducing unwarranted variation in access to NIV

1. All patients admitted with acute exacerbations of COPD to undergo blood gas analysis immediately on arrival in hospital
2. All patients with acute type 2 respiratory failure to undergo assessment for NIV within 60 minutes of arrival in hospital, as recommended in the British Thoracic Society guidelines (see "Resources")
3. NIV supported by senior-level decision-making to be made available in acute hospitals 24 hours per day
4. All patients who receive acute NIV to be coded as DZ21 E, F, or G (depending on complications) to ensure accuracy of data recording
5. Hospitals to monitor provision of and outcomes from NIV through regular clinical audit

RESOURCES

- British Thoracic Society (2008) Non-invasive ventilation in chronic obstructive pulmonary disease: management of acute type 2 respiratory failure. RCP/BTS Concise guideline. <http://www.brit-thoracic.org.uk/guidelines/nippv-%E2%80%93-niv-in-acute-respiratory-failure-guideline.aspx>
- Department of Health (2011) An outcomes strategy for people with chronic obstructive pulmonary disease (COPD) and Asthma in England. http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_127974
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1 Lightowler J, Wedzicha J, Elliott M et al (2003) Non-invasive positive pressure ventilation to treat respiratory failure resulting from exacerbations of chronic obstructive pulmonary disease: Cochrane systematic review and meta-analysis. *British Medical Journal* 326:185.

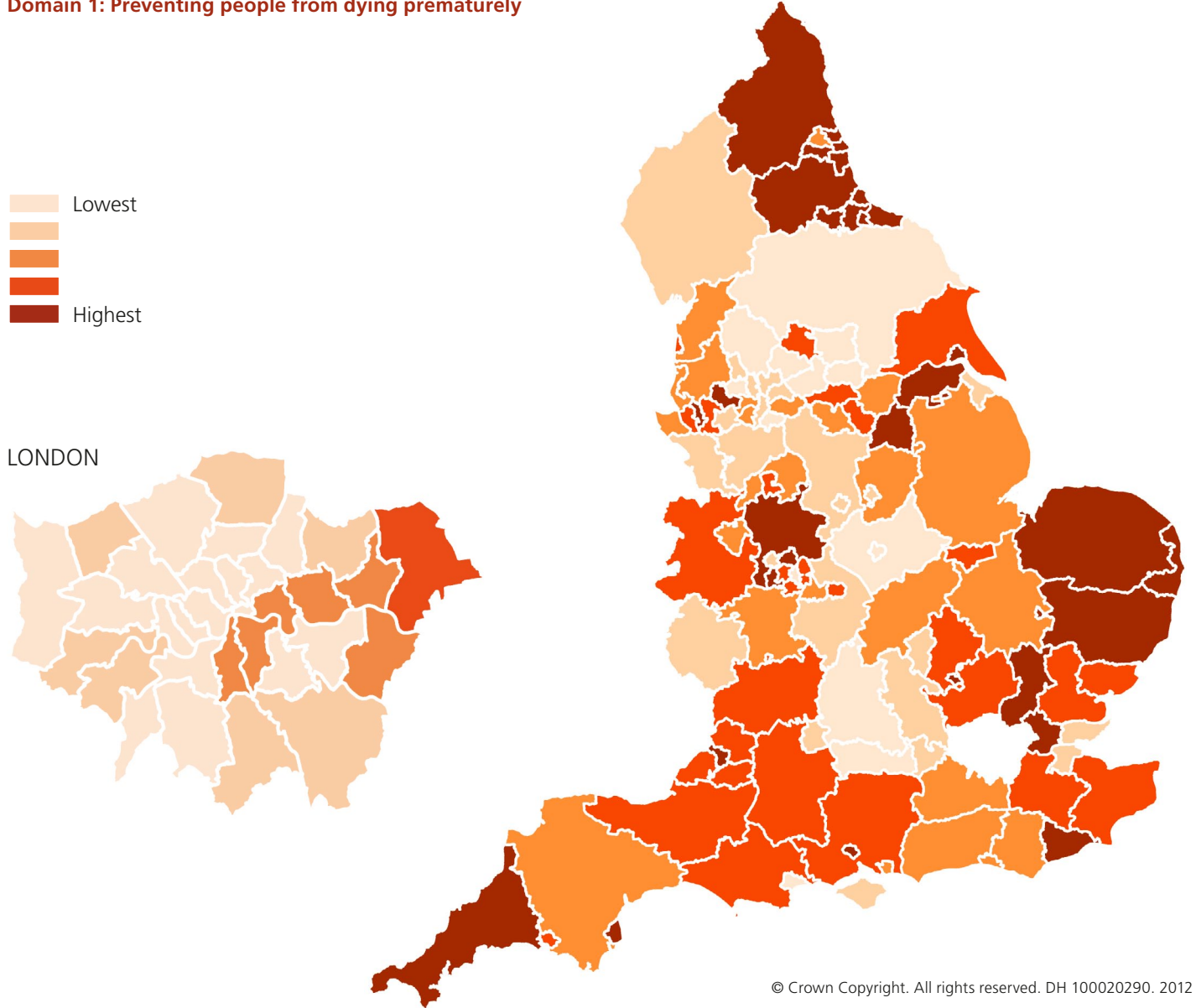
2 Royal College of Physicians. National COPD Audit 2008. <http://old.rcplondon.ac.uk/clinical-standards/ceeu/Current-work/ncrop/Pages/audit.aspx>

CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD)

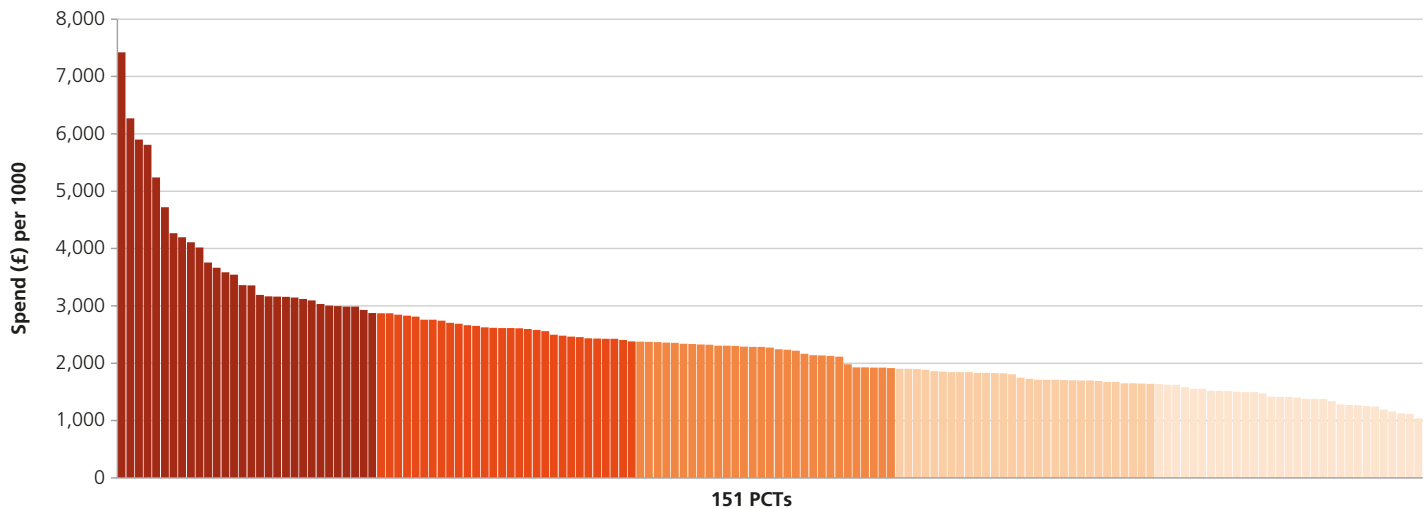
Map 8: Rate of expenditure (£) on home oxygen therapy per population by PCT

2010/11

Domain 1: Preventing people from dying prematurely



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Context

Home oxygen therapy is provided to 85,000 people in England, costing approximately £110 million per year. The most common reason for prescribing long-term home oxygen therapy is COPD. It is also provided to people with other lung conditions, heart disease and neurological disease, and in palliative care. Where indicated, long-term home oxygen therapy can improve survival in COPD, but it is often prescribed without a clear clinical indication, in which case the patient derives no clinical benefit. Oxygen is indicated only when the blood-oxygen level is low; it is not effective for breathlessness in the absence of low blood-oxygen levels.

Internal Department of Health estimates suggest around one-third of people prescribed oxygen derive no clinical benefit from it or do not use it. Historically payment has been based on oxygen provision, not on usage, thus costs are incurred even when oxygen is not used. Although expenditure is high, many PCTs do not undertake quality-assured clinical assessment and review of patients' need for long-term oxygen, thereby decreasing the quality of care and increasing the likelihood of waste.

Magnitude of variation

For PCTs in England, the rate of expenditure on home oxygen therapy ranged from £1039 to £7422 per 1000 population (7-fold variation). When the five PCTs with the highest rates of expenditure and the five PCTs with the lowest rates of expenditure are excluded, the range is £1245–£4721 per 1000 population, and the variation is 3.8-fold.

Some variation will be due to differences in population composition and disease prevalence. However, when adjusted for COPD prevalence, the variation is 2.9-fold after exclusion of the five PCTs with the highest rates and the five PCTs with the lowest rates (see Figure 8.1). Reasons for unwarranted variation include provision of oxygen for people who do not need it or who are not using it, and failure to identify all patients who would benefit from it. The degree of variation observed shows there is considerable scope for increasing the value of home oxygen therapy by improving the quality of care and reducing waste.

Options for action

Department of Health internal analysis revealed that savings of up to 30% in the first year (equivalent to £45 million nationally or £300,000 per PCT) could be achieved

through setting up a home oxygen service with structured clinical assessment, and regular review of requirements to ensure patients receive home oxygen only after appropriate assessment. To increase the value from home oxygen therapy, commissioners and providers need to consider the interventions in Box 8.1

Box 8.1: Increasing the value of home oxygen therapy

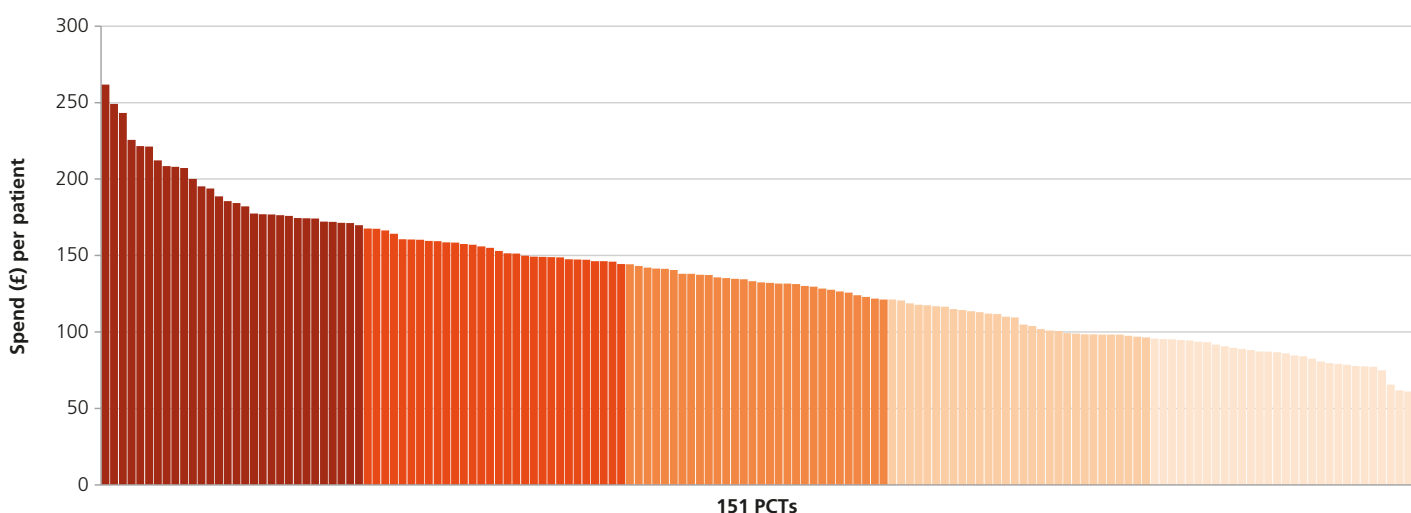
1. Undertake regular pulse oximetry on patients with COPD managed in primary or specialist care to determine oxygen saturation
2. Consider oxygen therapy only in patients with oxygen saturation of 92% or less
3. Refer patients with oxygen saturation of 92% or less to a home oxygen assessment and review service for structured assessment
4. Prescribe oxygen therapy only after structured assessment by a home oxygen assessment and review service
5. Review patients treated with home oxygen for their oxygen requirement every 6 months by the home oxygen assessment and review service

See Case-study 5, page 65.

RESOURCES

- › NHS Medical Directorate (2012) COPD Commissioning Toolkit. A Resource for Commissioners. <https://www.wp.dh.gov.uk/publications/files/2012/08/chronic-obstructive-pulmonary-disease-COPD-commissioning-toolkit.pdf>
- › NICE (2011) Chronic obstructive pulmonary disease quality standard. <http://www.nice.org.uk/guidance/qualitystandards/chronicobstructivepulmonarydisease/copdqualitystandard.jsp>
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- › Quality Intelligence East. INHALE – Interactive Health Atlas for Lung conditions in England. <http://www.inhale.nhs.uk/>

Figure 8.1: Rate of expenditure (£) on home oxygen therapy per patient diagnosed with COPD by PCT 2010/11

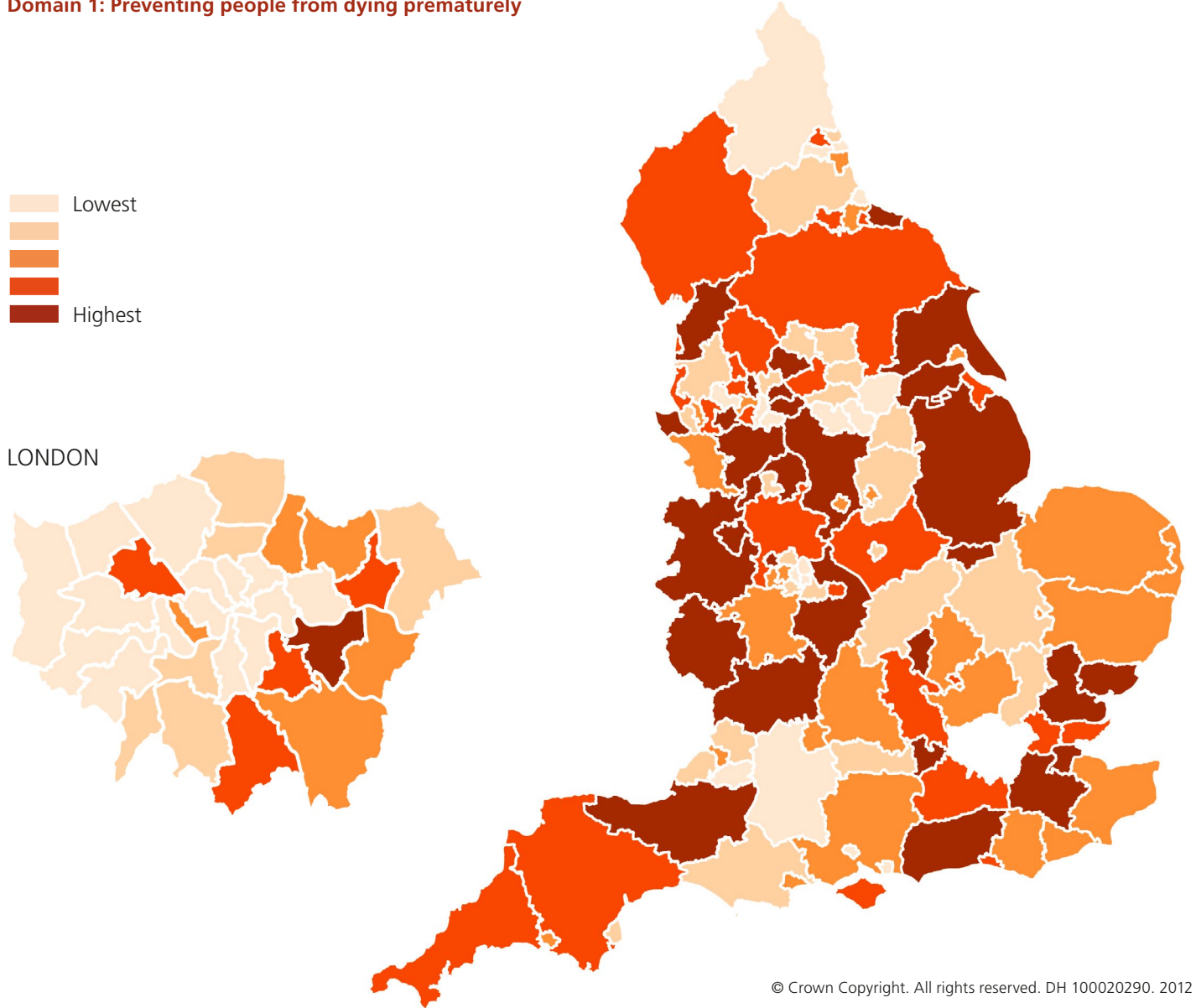


CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD)

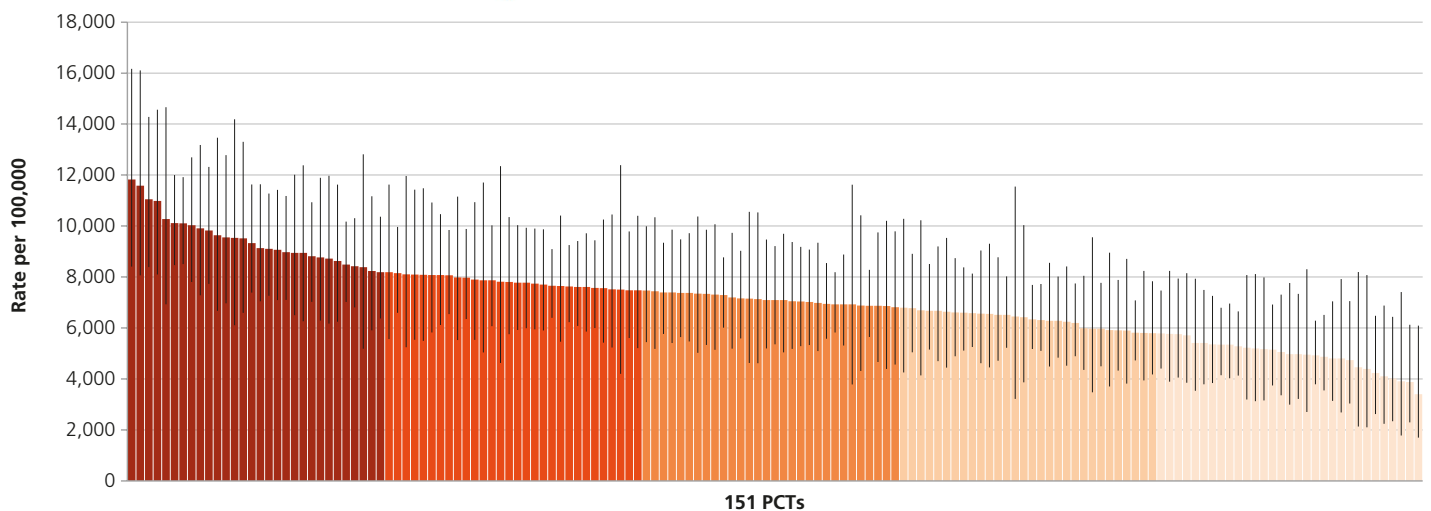
Map 9: Rate of deaths per population within 30 days of an admission for COPD by PCT

Indirectly standardised rate 2009/10

Domain 1: Preventing people from dying prematurely



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Context

COPD is characterised by a progressive decline in lung function and in health status, accompanied by repeated acute exacerbations. Sometimes these exacerbations can be managed in primary care and recovery is fairly rapid, but sometimes they require more intensive management in hospital and the episode may be complicated by respiratory failure.

Acute exacerbation of COPD requiring hospital admission is a condition with a high mortality. One in 12 patients admitted because of an exacerbation will die during their hospital stay and one in six will have died within 90 days. Mortality at 90 days is higher for COPD than it is for acute myocardial infarction.

Magnitude of variation

For PCTs in England, the rate of deaths within 30 days of an admission for COPD ranged from 3404.6 to 11,826.1 per 100,000 population (3.5-fold variation). When the five PCTs with the highest rates and the five PCTs with the lowest rates are excluded, the range is 4237.5–10,119.0 per 100,000 population, and the variation is 2.4-fold.

Thus, for people with COPD, the risk of dying within 30 days of an acute admission for COPD can vary nearly two and a half times depending on where they live.

Some of the difference in death rates within 30 days of an admission for COPD may be due to differences in:

- › case-mix;
- › population composition.

However, some of the difference in death rates is likely to be due to variation in the quality of clinical care provided before, during and following admission to hospital.

The degree of variation observed suggests there is considerable scope to achieve better outcomes for patients with COPD.

Options for action

To improve patient outcomes through the prompt and pro-active management of acute exacerbation of COPD, commissioners and providers need to consider the interventions shown in Box 9.1.

Box 9.1: Prompt and pro-active management of acute exacerbation of COPD

1. Structured hospital admission
2. Assessment within 24 hours by a respiratory specialist
3. Daily senior-level decision-making by a respiratory clinician
4. Prompt blood-gas analysis and assessment for non-invasive ventilation
5. Provision of non-invasive ventilation where indicated within the recommended 1 hour
6. Comprehensive assessment and management of co-morbid conditions
7. Optimisation of medical therapy
8. Referral for pulmonary rehabilitation
9. Referral for home oxygen assessment and review if indicated

RESOURCES

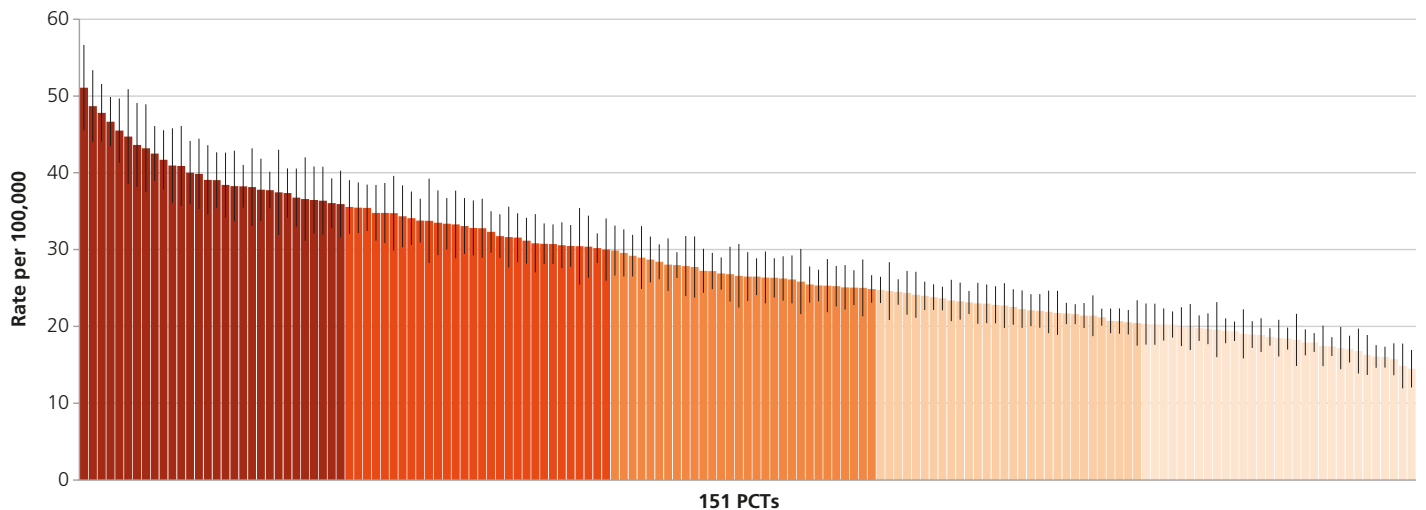
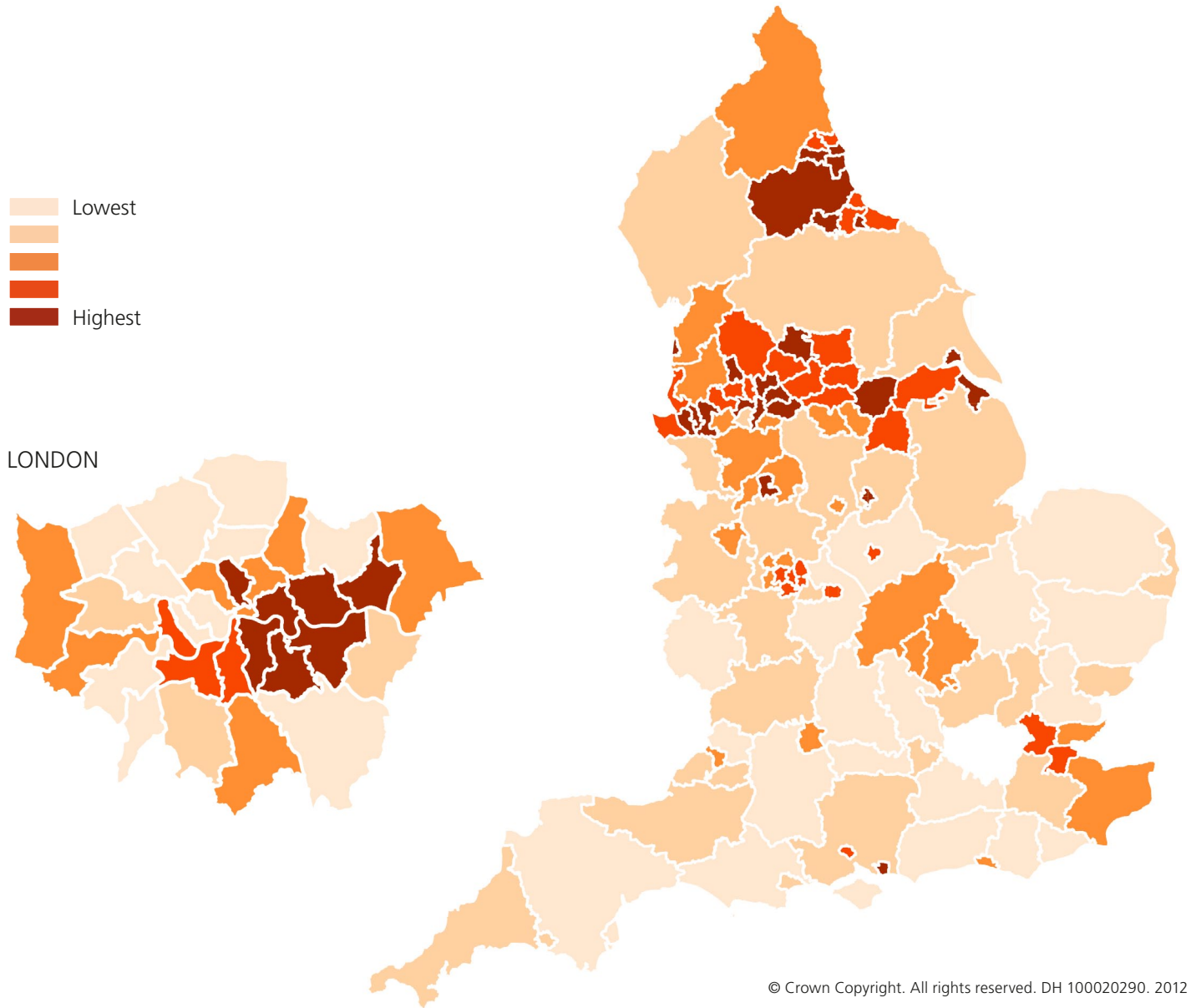
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- › Quality Intelligence East. INHALE – Interactive Health Atlas for Lung conditions in England. <http://www.inhale.nhs.uk/>

CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD)

Map 10: Rate of COPD mortality per population by PCT

Directly standardised rate 2008–2010

Domain 1: Preventing people from dying prematurely



Context

COPD is the fifth leading cause of death in England: 23,000 people die from the condition each year. In many people with COPD, the cause of death is related to co-existing conditions such as cardiovascular disease and cancer.

There is well-established evidence that healthcare interventions reduce mortality in COPD. Non-invasive ventilation (NIV) for people with COPD who develop respiratory failure is highly effective at reducing death rates. Long-term oxygen in appropriate patients, increase in physical activity and smoking cessation all improve survival. It is possible that evidence-based pharmacotherapy and prompt management of exacerbations will also reduce mortality.

Magnitude of variation

For PCTs in England, the rate of COPD mortality ranged from 14.5 to 51.1 per 100,000 population (3.5-fold variation). When the five PCTs with the highest rates and the five PCTs with the lowest rates are excluded, the range is 16.3–44.7 per 100,000 population, and the variation is 2.7-fold.

Thus, for patients with COPD, the chance of dying can vary more than two and a half times depending on where they live.

Some of the variation will reflect differences in:

- Levels of deprivation;
- Prevalence of COPD.

However, internal analysis at the Department of Health has shown that, after adjusting for deprivation, if all PCTs below the top quartile improved their performance to that of the top quartile, 7800 lives would be saved in England each year, and if PCTs below the median improved their performance to the median 3500 lives would be saved each year (see Table 10.1).

Table 10.1: Potential reduction in COPD mortality if all PCTs improved to median or top-quartile performance [derived from indirectly standardised mortality rates from bronchitis, emphysema and other COPD (ICD10 J40-J44) at PCT level, 2006–2008, adjusted for deprivation]

Level of improvement	Reduction in mortality	Deaths prevented
To top quartile	11.6%	7800
To median	5.2%	3500

Higher levels of mortality that cannot be explained by population composition or deprivation reflect unwarranted variation in outcomes for patients. The degree of variation observed in mortality is accompanied by considerable unwarranted variation in a range of indicators reflecting the quality and effectiveness of healthcare received by people with COPD as highlighted in Maps 1–9 (pages 22–37).

Options for action

To reduce avoidable mortality in patients with COPD, commissioners and providers need to ask questions about how care is delivered across the entire patient pathway, and consider implementing the interventions shown in Box 10.1.

Box 10.1: Interventions to reduce avoidable mortality in patients with COPD

- Quality-assured accurate and early diagnosis
- Pro-active chronic disease management with optimisation of pharmacotherapy and support for self-management
- Pro-active assessment and management of co-morbid conditions
- Prompt integrated management of acute exacerbations with specialist input when required
- Support for smoking cessation
- Home oxygen therapy when indicated after structured assessment

See Case-study 6, page 66.

RESOURCES

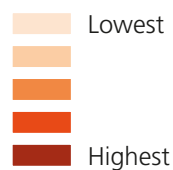
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- Quality Intelligence East. INHALE – Interactive Health Atlas for Lung conditions in England. <http://www.inhale.nhs.uk/>

ASTHMA

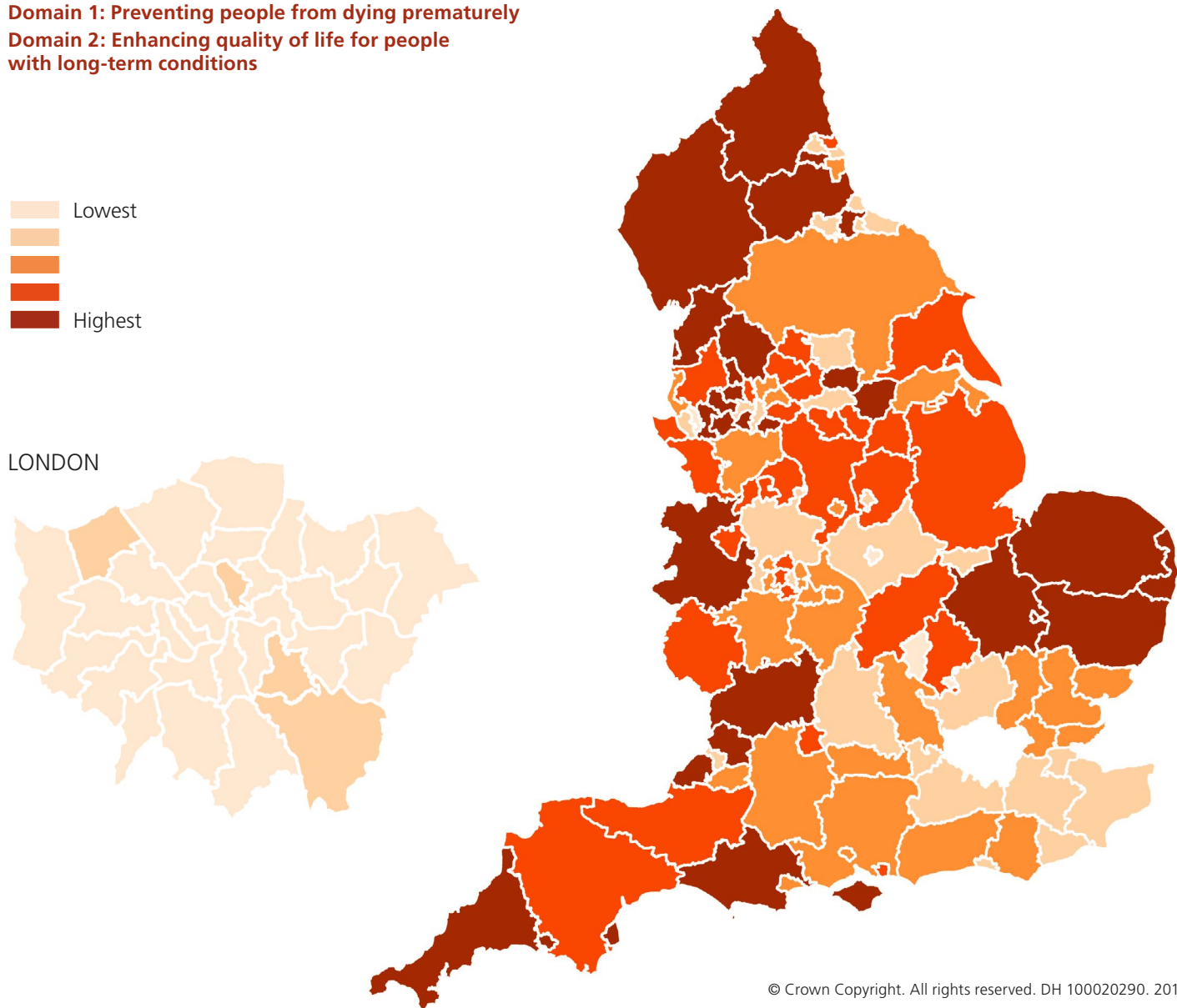
Map 11: Prevalence (%) of asthma recorded on GP registers by PCT

2010/11

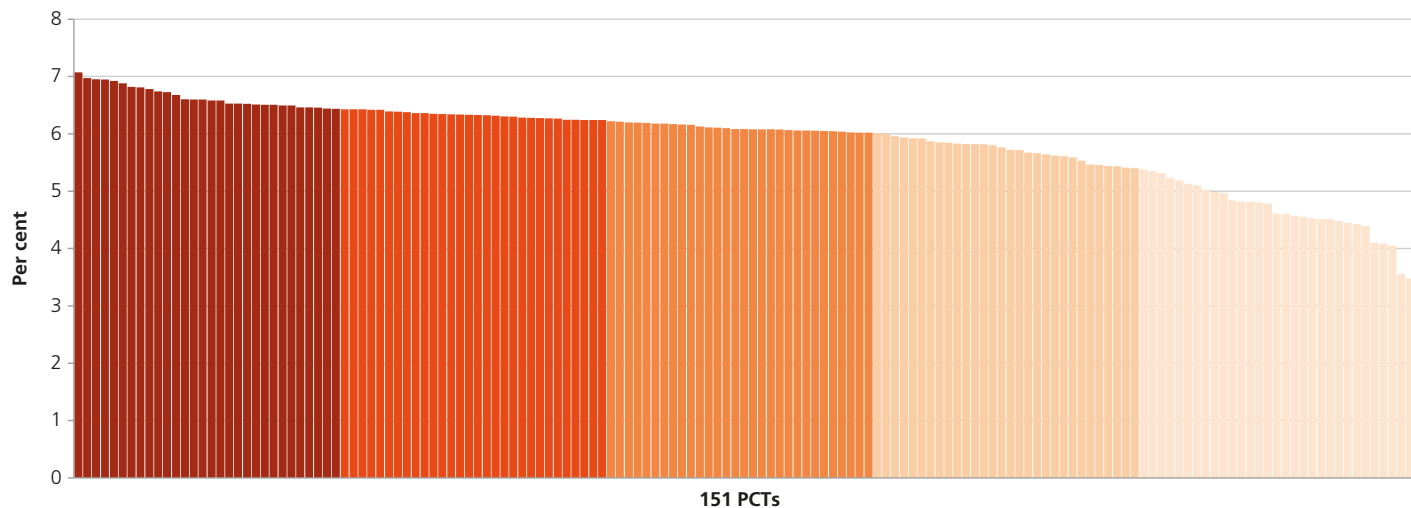
Domain 1: Preventing people from dying prematurely
 Domain 2: Enhancing quality of life for people with long-term conditions



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Context

In 2010/11, the prevalence of asthma in England, defined as receiving asthma treatment in the last year, and based on data from GP QOF registers, was 5.9%. By contrast, in the Health Survey for England 2010, 9.5% of adults and children reported having asthma according to this definition¹, suggesting that many people with asthma are not included in GP registers. 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 a disease register are essential prerequisites for structured pro-active asthma care.

Diagnosing asthma is often difficult: there is no single diagnostic measure, as there is in diabetes or hypertension. Accurate diagnosis requires a careful history and often several consultations with home measurement of peak flow and trials of therapy. Use of inhaler treatment without full assessment and follow-up may relieve some symptoms but mask the diagnosis. There are SIGN/BTS guidelines to help clinicians diagnose asthma (see “Resources”).

Magnitude of variation

For PCTs in England, the prevalence of asthma recorded on GP registers ranged from 3.5% to 7.1% (2-fold variation). When the five PCTs with the highest percentages and the five PCTs with the lowest percentages are excluded, the range is 4.4–6.9%, and the variation is 1.6-fold.

However, average values at PCT level mask much greater differences among practices within PCTs: in Figure 11.1, the prevalence of asthma on GP registers among 103 practices in one PCT ranged from 2.1% to 15.0% (7-fold variation); when the three practices with the highest percentages and the three practices with the lowest percentages are excluded, the range is 2.8–9.0%, and the variation is 3.2-fold. When comparing practices across England (n=8246), but excluding the 250 practices with the highest percentages and the 250 practices with the lowest percentages, the prevalence of asthma on GP registers ranges from 3.2% to 8.5%, and the variation is 2.6-fold.

The degree of variation observed and the discrepancy with the finding in the Health Survey for England would indicate that many people with asthma are not on GP registers. As a result,

such people are at high risk of not receiving regular clinical review to ensure that symptoms are controlled and to support self-management. The consequences of poor control are: 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.

Options for action

In all localities, commissioners and practices need to investigate variation in the reported prevalence of asthma at practice level.

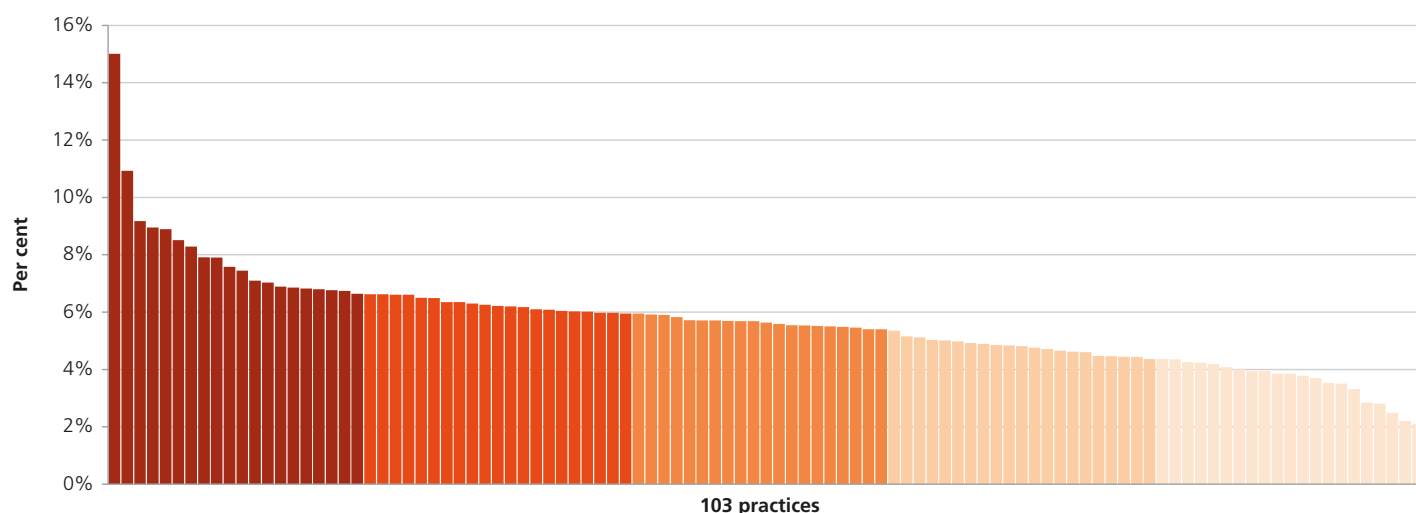
Commissioners need to ensure that primary care staff are adequately trained and supported by accessible diagnostic services to diagnose asthma accurately, in line with the SIGN/BTS clinical guidelines (see “Resources”).

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

- Department of Health (2011) An outcomes strategy for people with chronic obstructive pulmonary disease (COPD) and Asthma in England. http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_127974
- Department of Health (2012) An Outcomes Strategy for COPD and Asthma: NHS Companion Document. http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_134000
- Scottish Intercollegiate Guidelines Network and British Thoracic Society (2008; revised 2012) British Guideline on the Management of Asthma. A national clinical guideline. <http://www.sign.ac.uk/pdf/sign101.pdf>
- Quality Intelligence East. INHALE – Interactive Health Atlas for Lung conditions in England. <http://www.inhale.nhs.uk/>
- British Thoracic Society. <http://www.brit-thoracic.org.uk/>
- The Primary Care Respiratory Society. <http://www.pcrs-uk.org/>
- IMPRESS – Improving and integrating respiratory services. <http://www.impressresp.com/>

Figure 11.1: Prevalence of asthma recorded on GP registers in 103 practices within a PCT 2010/11



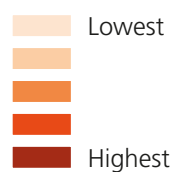
1 NHS Information Centre for health and social care (2011) Health Survey for England 2010 – Respiratory health. <http://www.ic.nhs.uk/pubs/hse10report>

ASTHMA

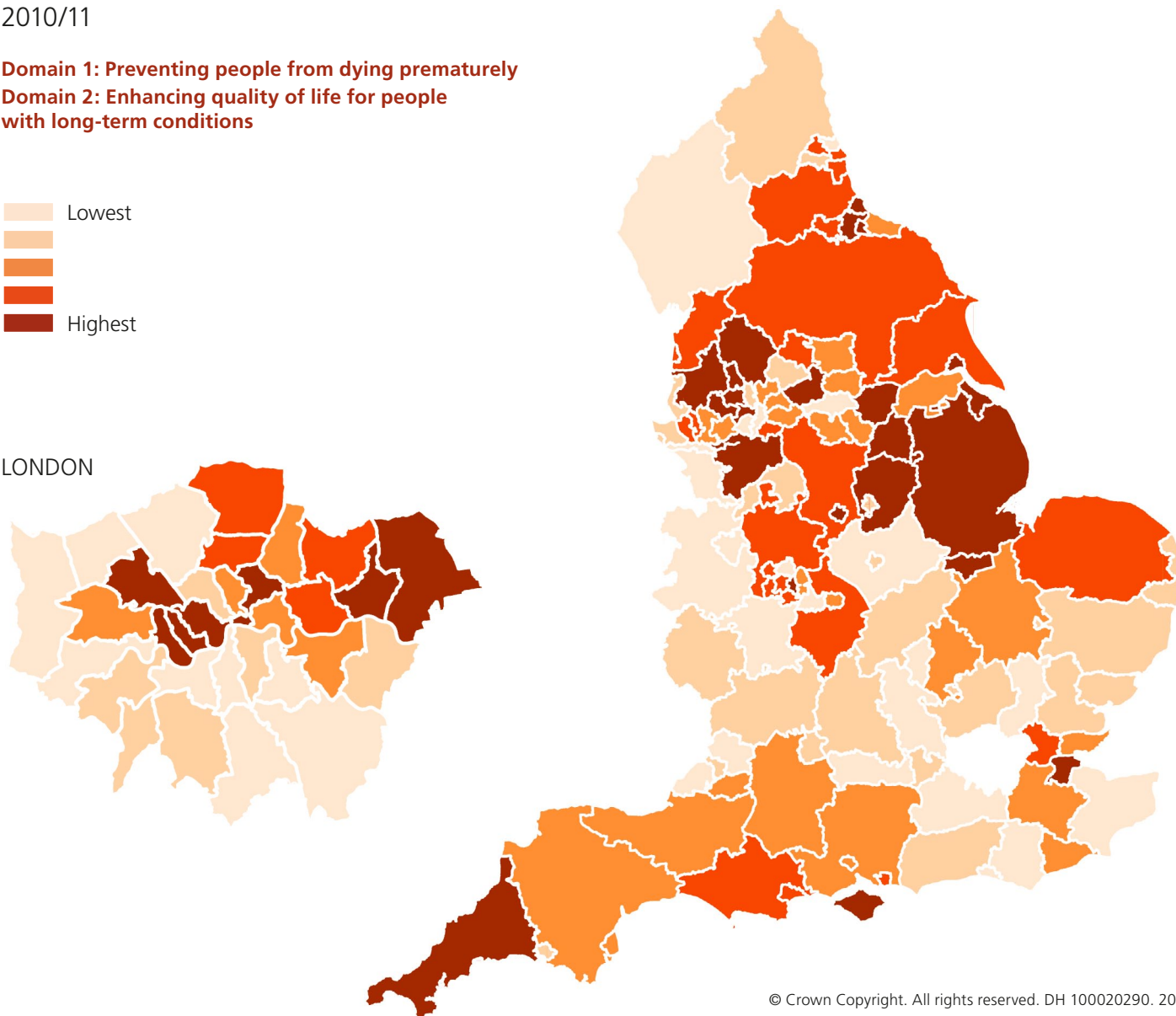
Map 12: Percentage of patients with asthma who have had an asthma review in the previous 15 months by PCT (QOF Asthma 6)¹

2010/11

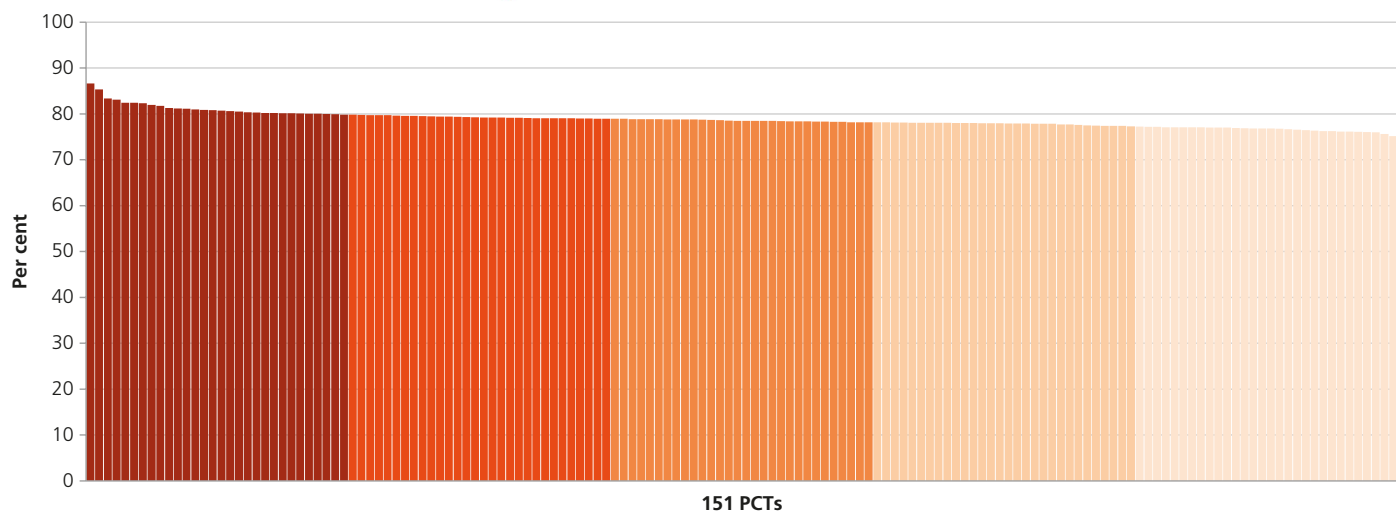
Domain 1: Preventing people from dying prematurely
 Domain 2: Enhancing quality of life for people with long-term conditions



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Context

In the Scottish Intercollegiate Guidelines Network (SIGN) and British Thoracic Society (BTS) guideline (see “Resources”), it is recommended that people with asthma should receive regular clinical review to ensure their symptoms are controlled and thereby minimise disruption to daily life. In England, up to one-quarter of people with asthma do not receive an annual clinical review.

Pro-active structured care has benefits for patients with asthma. Important elements of structured asthma management are checking symptom levels, peak flow, inhaler technique, and adherence to current treatment, in addition to supporting patients in the understanding of their condition such that they can self-manage.

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 except appropriate patients from the target population to avoid being penalised for factors beyond the practices’ control, e.g. when patients do not attend for review despite repeated invitations, or if a medication cannot be prescribed due to a contra-indication or side-effect. At over 1300 practices (of 8246; 16% in England), more than 10% of the local population with asthma are excepted from QOF Asthma 6.

The exception-adjusted population coverage is reported annually, and has been presented in this map.

Magnitude of variation

For PCTs in England, the percentage of patients with asthma who have had an asthma review in the previous 15 months ranged from 75.2% to 86.6% (1.2-fold variation). When the five PCTs with the highest percentages and the five PCTs with the lowest percentages are excluded, the range is 76.1–82.4%, and the variation is 1.1-fold.

All PCTs achieve the 70% higher payment threshold for this QOF indicator and at PCT level there is little variation. Within PCTs, variation at practice level is often greater; in England, exception-reporting at practice level varies from 0% to over 50%. The differences in exception-reporting suggest that some practices are more effective than others at reaching the local asthma population and thereby at influencing patient outcomes.

Options for action

Patients who are not reviewed or who are excepted 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 many of the 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 12.1 and help more local practices to become effective at reaching the entire local population with COPD through regular review.

Box 12.1: 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

See Case-study 7, page 67.

RESOURCES

- › Scottish Intercollegiate Guidelines Network and British Thoracic Society (2008; revised 2012) British Guideline on the Management of Asthma. A national clinical guideline. <http://www.sign.ac.uk/pdf/sign101.pdf>
- › Department of Health (2011) An outcomes strategy for people with chronic obstructive pulmonary disease (COPD) and Asthma in England. http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_127974
- › Department of Health (2012) An Outcomes Strategy for COPD and Asthma: NHS Companion Document. http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_134000
- › Quality Intelligence East. INHALE – Interactive Health Atlas for Lung conditions in England. <http://www.inhale.nhs.uk/>
- › British Thoracic Society. <http://www.brit-thoracic.org.uk/>
- › The Primary Care Respiratory Society. <http://www.pcrs-uk.org/>
- › IMPRESS – Improving and integrating respiratory services. <http://www.impressresp.com/>

1 In the Quality and Outcomes Framework (QOF) 2012-2013, Asthma 6 is replaced by Asthma 9, which requires that patients are asked the three questions on asthma control developed by the Royal College of Physicians.

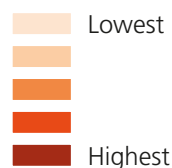
ASTHMA

Map 13: Rate of emergency admissions to hospital in people aged 18 years and over with asthma per population by PCT

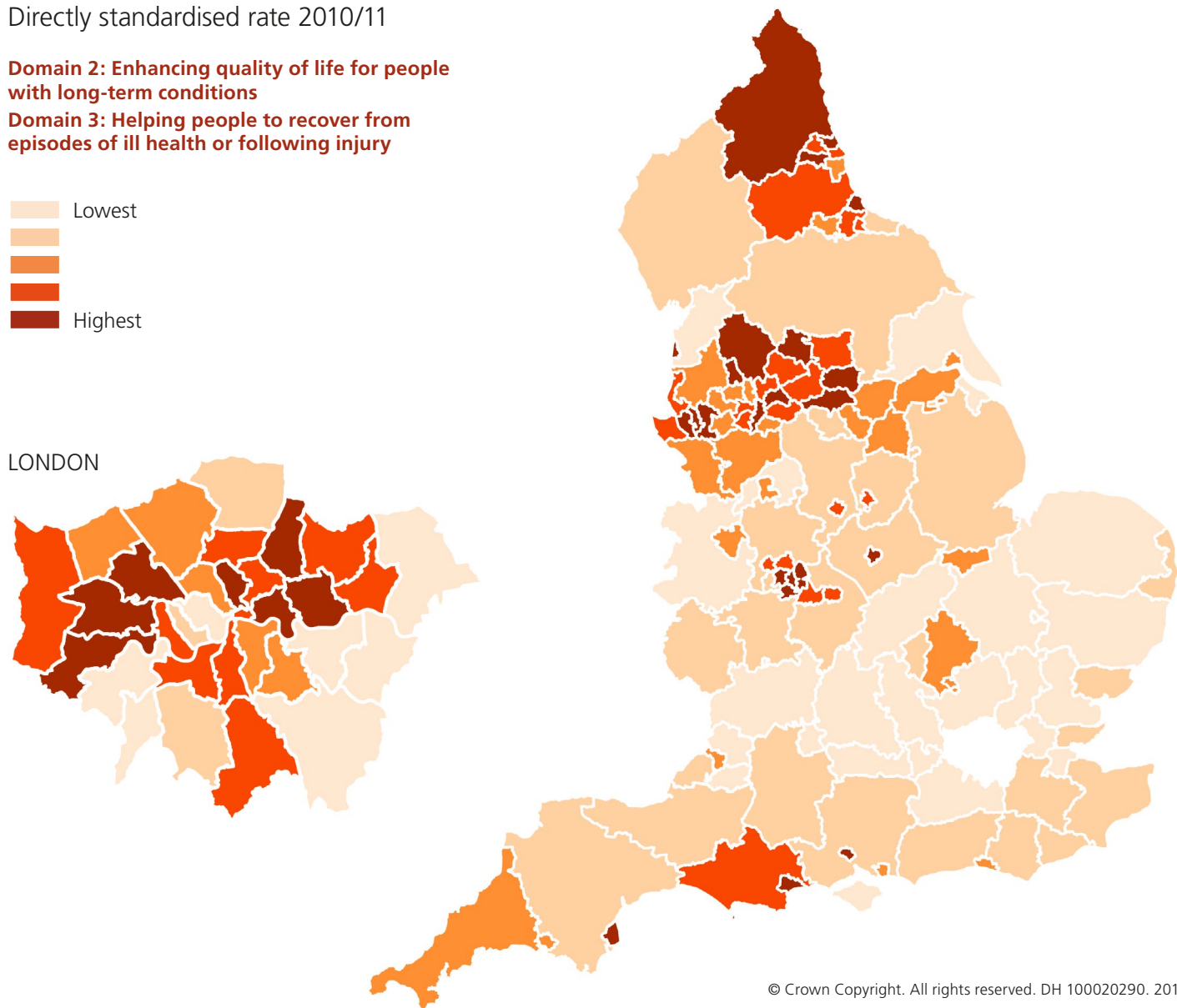
Directly standardised rate 2010/11

Domain 2: Enhancing quality of life for people with long-term conditions

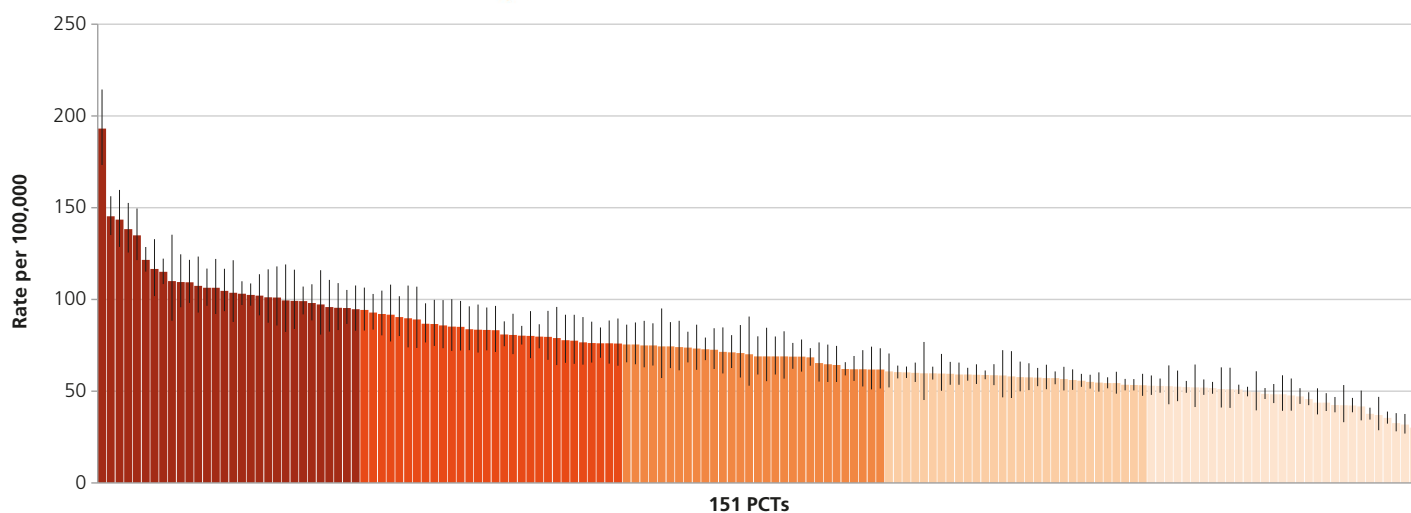
Domain 3: Helping people to recover from episodes of ill health or following injury



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Context

The goal of asthma care is to control symptoms such that people with asthma are able to lead as normal a life as possible, which should be achievable in the majority of patients. An emergency hospital attendance or admission represents a serious loss of control of a person's asthma. Admissions are sometimes necessary for specialist management of severe exacerbations, but it has been estimated that around three-quarters of admissions in the UK are preventable.¹ Most patients with asthma have had symptoms for several days before an admission, indicating that there is time in which interventions to prevent admission could be administered.

Structured self-management support including an individual action plan is a key element of chronic disease management in asthma. People who have an asthma action plan have fewer hospitalisations, fewer emergency department visits, and fewer unscheduled visits to the doctor than people who do not have such a plan.²

Magnitude of variation

For PCTs in England, the rate of emergency admissions to hospital in people aged 18 years and over with asthma ranged from 30.1 to 193.0 per 100,000 population (6-fold variation). When the five PCTs with the highest rates and the five PCTs with the lowest rates are excluded, the range is 37.6–121.6 per 100,000 population, and the variation is 3.2-fold (see Table 13.1 for earlier data).

Thus, for people with asthma, the risk of being admitted with an acute exacerbation can vary up to three times depending on where they live. 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, and the support people receive to manage their condition. What is achievable for patients in one locality should be possible in all localities if best practice is adopted in the NHS.

Emergency admission to hospital is a major adverse outcome for patients. The degree of variation observed shows that in many localities there is substantial scope for reducing emergency events. Action to prevent admissions will save money and improve outcomes for patients.

Options for action

For many patients, emergency admission to hospital can be avoided by ensuring optimal chronic disease management and structured support for self-management (see Box 13.1) so that patients know the appropriate action to take at the first sign of deterioration.

Box 13.1: Optimal chronic disease management and structured support for self-management of asthma

1. As part of structured asthma education, in partnership with patients, develop an asthma action plan for all patients to help them identify deterioration and know what actions to take; review plans regularly and always at the time of emergency department attendance or hospital admission
2. Deliver care in line with the SIGN/BTS guideline (see "Resources")
3. Provide training in asthma management and the provision of structured self-management support to healthcare professionals managing patients with asthma
4. Give a structured primary care review at least once a year to all patients in line with the SIGN/BTS guideline
5. A clinician with expertise in asthma management to review all patients attending hospital with acute exacerbations, preferably within 30 days of attendance
6. To help practices identify patients who need more active monitoring and management, develop a register of patients at risk of admission; include patients who have had an admission in the previous 12 months, patients identified through audit to be using excessive quantities of short-acting bronchodilators, and patients who have had a course of oral steroids in the preceding 12 months

See Case-study 8, page 68.

RESOURCES

- ▶ Department of Health (2011) An outcomes strategy for people with chronic obstructive pulmonary disease (COPD) and Asthma in England. http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_127974
- ▶ Department of Health (2012) An Outcomes Strategy for COPD and Asthma: NHS Companion Document. http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_134000
- ▶ Scottish Intercollegiate Guidelines Network (SIGN) and British Thoracic Society (BTS) (2008; revised 2012) British Guideline on the Management of Asthma. A national clinical guideline. <http://www.sign.ac.uk/pdf/sign101.pdf>
- ▶ NHS Improvement – Lung. National Emerging Learning Publications. <http://www.improvement.nhs.uk/lung/Resources/LungImprovementPublications/tabid/149/Default.aspx>
- ▶ Lindsay J, Heaney L (2011) British Thoracic Society Adult Asthma Audit Report 2011 (Audit Period – 1 September 2011–31 October 2011). <http://www.brit-thoracic.org.uk/Portals/0/Audit%20Tools/Adult%20Asthma%20Summary%20Report%202011.pdf>

Table 13.1: Rate of emergency admissions to hospital in people aged 18 years and over with asthma per 100,000 population by PCT over three financial years

Date	Range before exclusions	Fold difference before exclusions	Range after exclusions	Fold difference after exclusions	Notes
2008/09	51.8–266.6	5	60.9–183.2	3.0	Map 16, Atlas 1.0 (2010)
2009/10	31.2–173.9	6	39.5–117.9	3.0	Map 38, Atlas 2.0 Amendments August 2012
2010/11	30.1–193.0	6	37.6–121.6	3.2	

1 Asthma UK (2008) Wish You Were Here? http://www.asthma.org.uk/media/141047/wish_you_were_here_-_uk_report.pdf

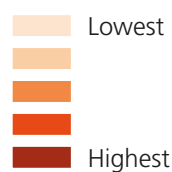
2 Gibson PG, Powell H, Wilson A, Abramson MJ, Haywood P, Bauman A, Hensley MJ, Walters EH, Roberts JLL (2002) Selfmanagement education and regular practitioner review for adults with asthma. Cochrane Database of Systematic Reviews 2002, Issue 3. Art. No.: CD001117. doi: 10.1002/14651858.CD001117.

ASTHMA

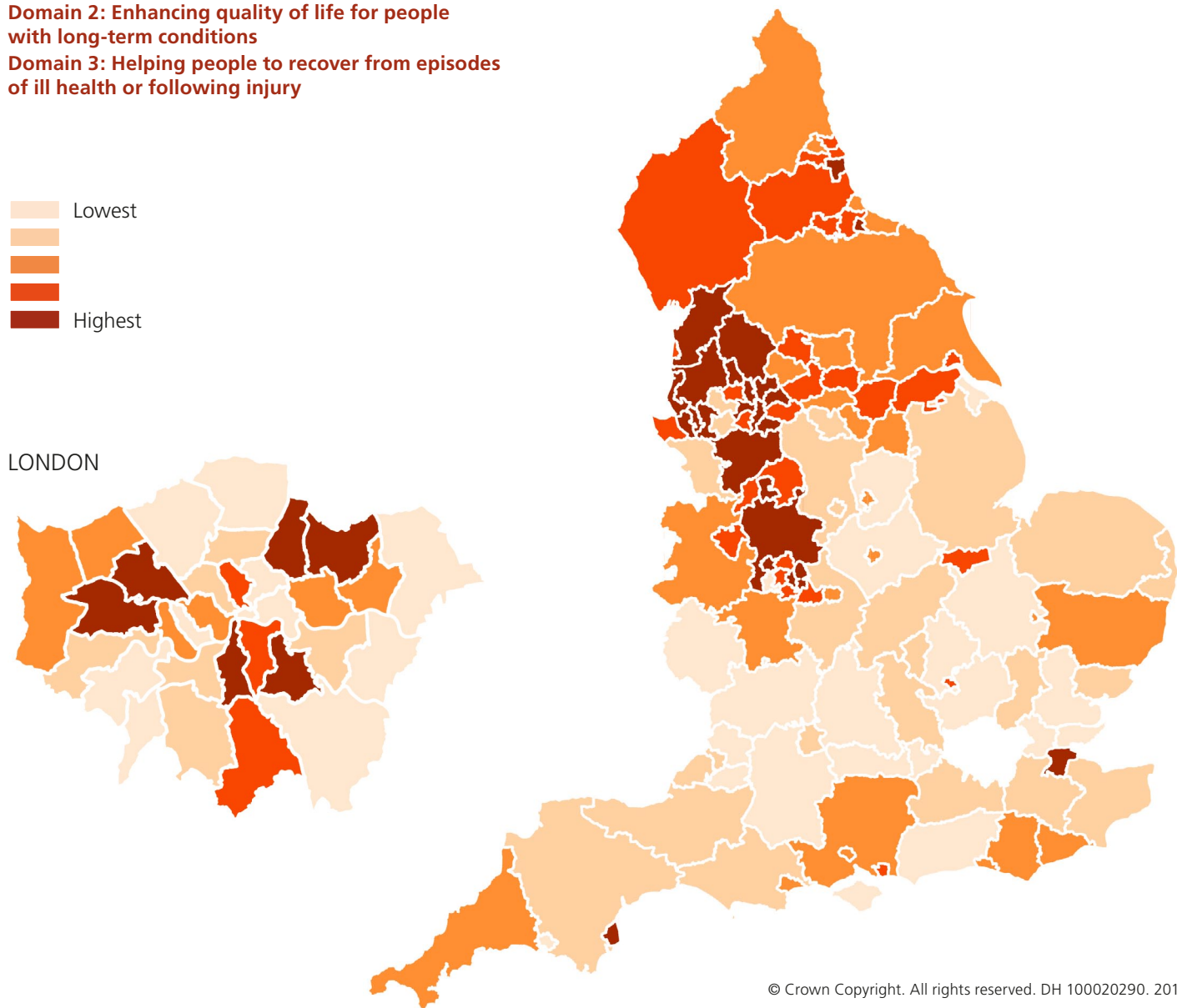
Map 14: Emergency admission rate for children with asthma per population aged 0–17 years by PCT

Directly standardised rate 2010/11

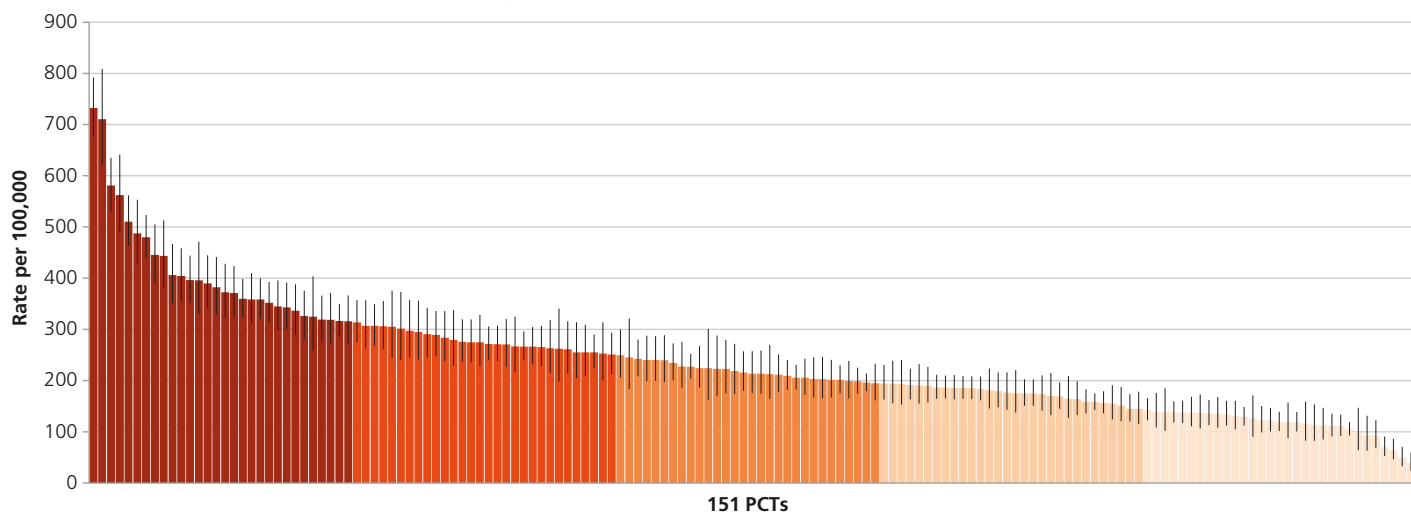
Domain 2: Enhancing quality of life for people with long-term conditions
 Domain 3: Helping people to recover from episodes of ill health or following injury



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Context

Asthma is the commonest long-term medical condition in childhood. Emergency admissions should be avoided whenever possible.

Unplanned hospitalisation for asthma, diabetes and epilepsy in children and young people under 19 years is a national quality indicator in the NHS Outcomes Framework 2012/13.

Magnitude of variation

For PCTs in England, the emergency admission rate for children with asthma ranged from 38.7 to 732.6 per 100,000 population aged 0–17 years (19-fold variation). When the five PCTs with the highest emergency admission rates and the five PCTs with the lowest emergency admission rates are excluded, the range is 92.9–487.4 per 100,000 population aged 0–17 years, and the variation is 5-fold (see Table 14.1 for 2009/10 data).

Rising emergency admissions for asthma (see Table 14.1) may reflect an overall rising trend for “zero-day” admissions for all children, such as in paediatric short-stay units. However, even short admissions incur substantial costs and have implications for the child’s quality of life.

One of the reasons for variation in the emergency admission rate could be deprivation: there is a moderate correlation between frequency of emergency admission and the level of socio-economic deprivation ($r=0.56$; Figure 14.1). However, this may not be the sole explanation for the degree of variation observed because a comparison of the 10 most-deprived PCTs shows a 19-fold variation in emergency admission rates and a 2.1-fold variation among the 10 least-deprived PCTs (see Figure 14.2, page 60).

There may be several explanations for the large degree of variation in the rate of emergency admissions:

- 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 clinicians.

Options for action

Commissioners need to ascertain whether any rise in emergency admissions for asthma is:

- the result of overall local trends, reflecting access to urgent care;
- symptomatic of deficiencies in the local asthma pathway.

Primary and community care clinicians, working with asthma specialist teams as part of a local clinical network, can reduce

the burden of unnecessary admissions by improving long-term management of asthma and improving care throughout the pathway.

To reduce unwarranted variation in the local management of long-term conditions such as asthma, commissioners and providers can:

- use the ChiMat Disease Management Information Toolkit (see “Resources”);
- develop a management pathway for asthma.

Every child with asthma should have an Asthma Care Plan according to the British Thoracic Society/Scottish Intercollegiate Guidelines Network (BTS/SIGN) guideline on management of asthma (see “Resources”).

Commissioners need to ensure that the BTS/SIGN guidelines form the basis of local clinical asthma pathways for which they are responsible.

As the causes of asthma are multifactorial, action to reduce emergency admissions requires a whole pathway approach, including public health, and primary and secondary care. Parental education and school medication management are also vital aspects of the overall care of the child with asthma.

RESOURCES

- ChiMat Disease Management Information Toolkit (DMIT). <http://atlas.chimat.org.uk/IAS/dmit>
- Scottish Intercollegiate Guidelines Network (SIGN) and British Thoracic Society (BTS) (2008; revised 2012) British Guideline on the Management of Asthma. A national clinical guideline. <http://www.sign.ac.uk/pdf/sign101.pdf>

Figure 14.1: Correlation between emergency admission rate for children with asthma per 100,000 population aged 0–17 years by PCT 2010/11 and deprivation

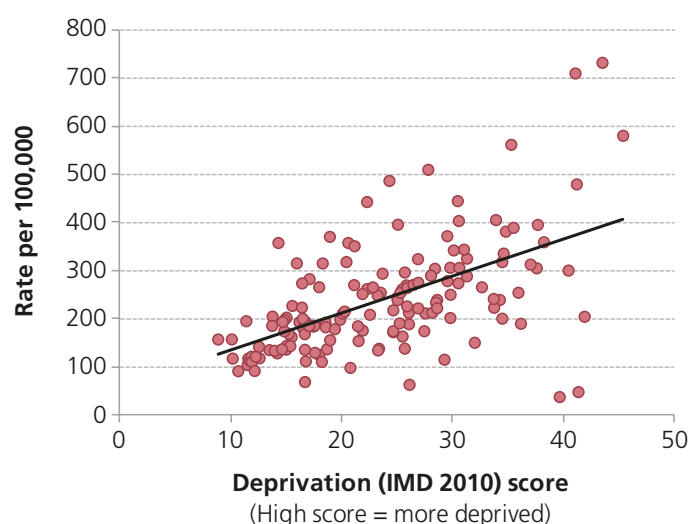


Table 14.1: Emergency admission rate for children with asthma per 100,000 population aged 0–17 years by PCT over two financial years¹

Date	Range before exclusions	Fold difference before exclusions	Range after exclusions	Fold difference after exclusions	Notes
2009/10	25.9–641.9	25	97.6–468.5	4.8	Map 19, Child Health Atlas (2012)
2010/11	38.7–732.6	19	92.9–487.4	5	

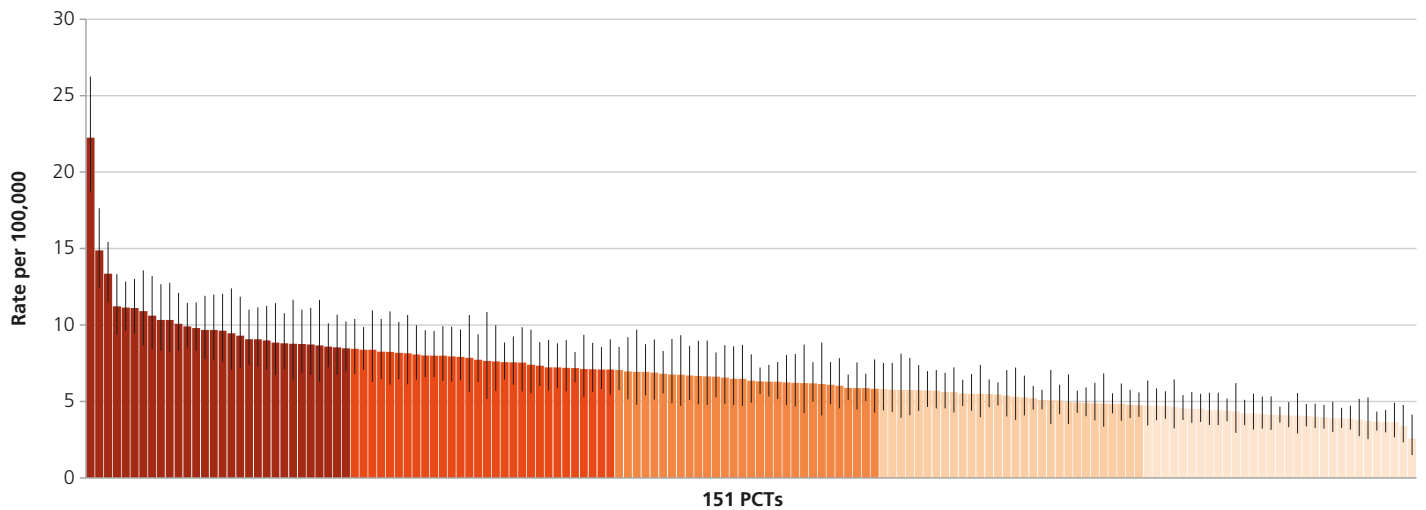
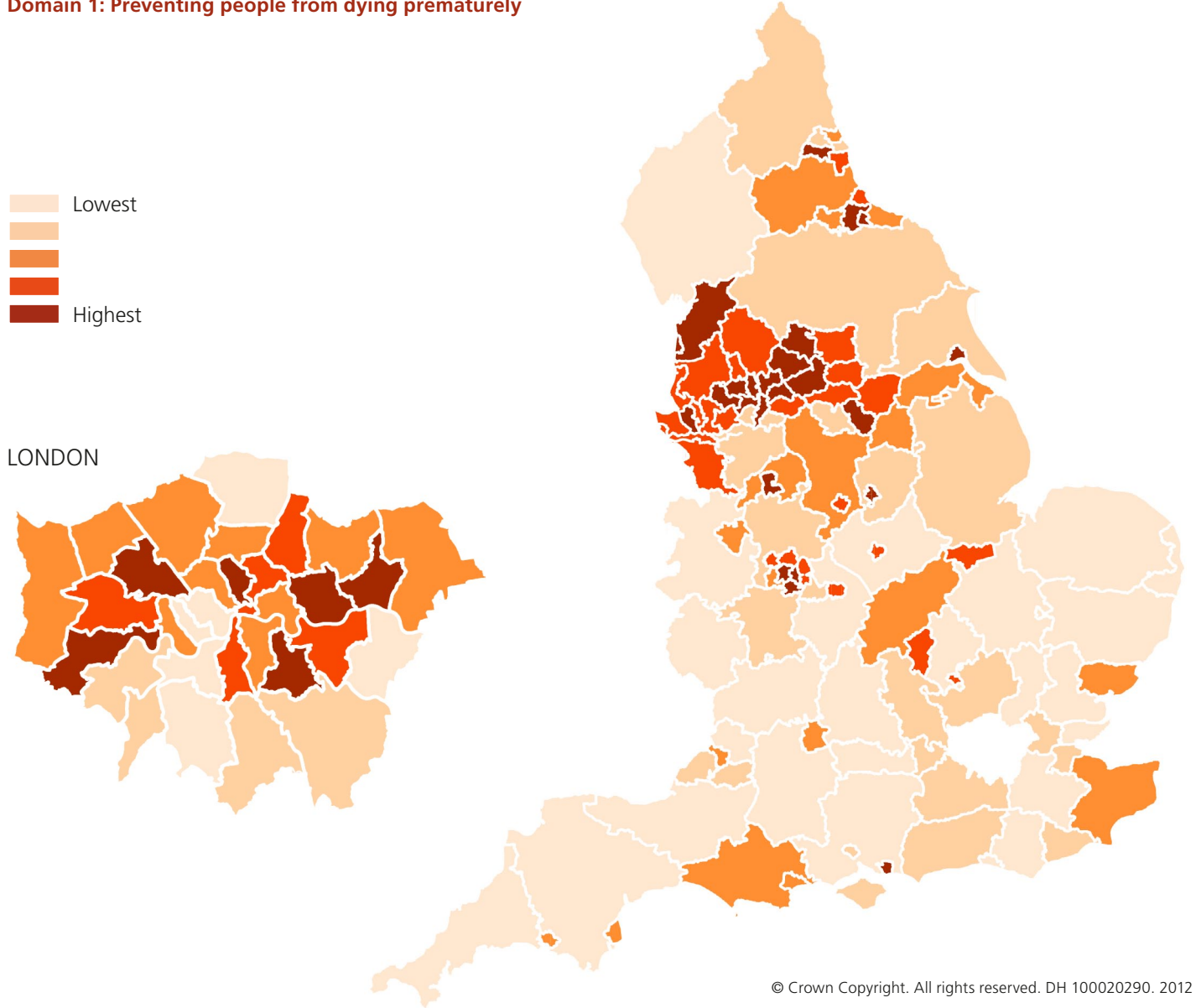
¹ Data from 2008/09 were mapped for a similar indicator in Atlas 1.0 (Map 17, page 56): the difference is that the denominator for the indicator in Atlas 1.0 was “persons aged 18 years and under” whereas for this indicator it is children aged 0–17 years.

PNEUMONIA

Map 15: Rate of pneumonia mortality in people aged under 75 years per population by PCT

Directly standardised rate 2007–2010

Domain 1: Preventing people from dying prematurely



Context

Pneumonia is the clinical manifestation of microbial infection within the lung tissue. It is common and can affect anyone, but it is more common in people:

- › at the extremes of age;
- › with any impairment of host defence.

Pneumonia causes a spectrum of illness severity. Most people have non-severe illness and are managed at home. About one in five require hospital management. There were over 170,000 hospital admissions for pneumonia in England in 2010/11. A few people need intensive care and some die. Death may be preventable with appropriate management, but often death is the unavoidable outcome of the natural course of other progressive respiratory, malignant or neurological disease.

Magnitude

For PCTs in England, the rate of pneumonia mortality in people under 75 years ranged from 2.6 to 22.3 per 100,000 population (9-fold variation). When the five PCTs with the highest rates and the five PCTs with the lowest rates are excluded, the range is 3.7–11.1 per 100,000 population, and the variation is 3.0-fold.

Much of this variation is likely to be due to differences in the case-mix of the local population, such as:

- › the frequency of higher age-groups;
- › smoking prevalence;
- › co-morbidity;
- › deprivation;
- › illness severity.

However, in some localities differences in the process of care could be important. Management issues include:

- › place of management – home, hospital or intensive care unit (ICU);
- › speed of access to care;

- › implementation of relevant treatment – antibiotics, fluid balance and gas-exchange correction;
- › appropriateness of management, e.g. type of antibiotic therapy and route of administration.

Artefact due to diagnostic inaccuracy could explain some of the variation observed.

Options for action

As there are many possible explanations for the degree of variation observed, commissioners and providers need to undertake careful data analysis and audit of diagnoses, pathways and processes of care to identify relevant correctable local causes.

Commissioners and providers need to consider interventions such as those presented in Box 15.1 to reduce mortality in patients with pneumonia.

Box 15.1: Appropriate management to prevent mortality in patients with pneumonia

1. Comparison of management with national guidelines
2. Use of quality markers in pneumonia management
3. Use of care bundles to improve pneumonia care
4. Continued drive to reduce tobacco smoking

RESOURCES

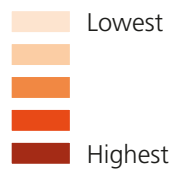
- › British Thoracic Society Community Acquired Pneumonia in Adults Guideline Group (2009) Guidelines for the management of community acquired pneumonia in adult: update 2009. *Thorax* 64: Supplement III. <http://www.brit-thoracic.org.uk/Portals/0/Clinical%20Information/Pneumonia/Guidelines/CAPGuideline-full.pdf>
- › British Thoracic Society Community Acquired Pneumonia in Children Guideline Group (2011) Guidelines for the management of community acquired pneumonia in children: update 2011. *Thorax* 66: Supplement 2. <http://www.brit-thoracic.org.uk/Portals/0/Clinical%20Information/Pneumonia/Guidelines/CAP%20children%20October%202011.pdf>

SLEEP-DISORDERED BREATHING

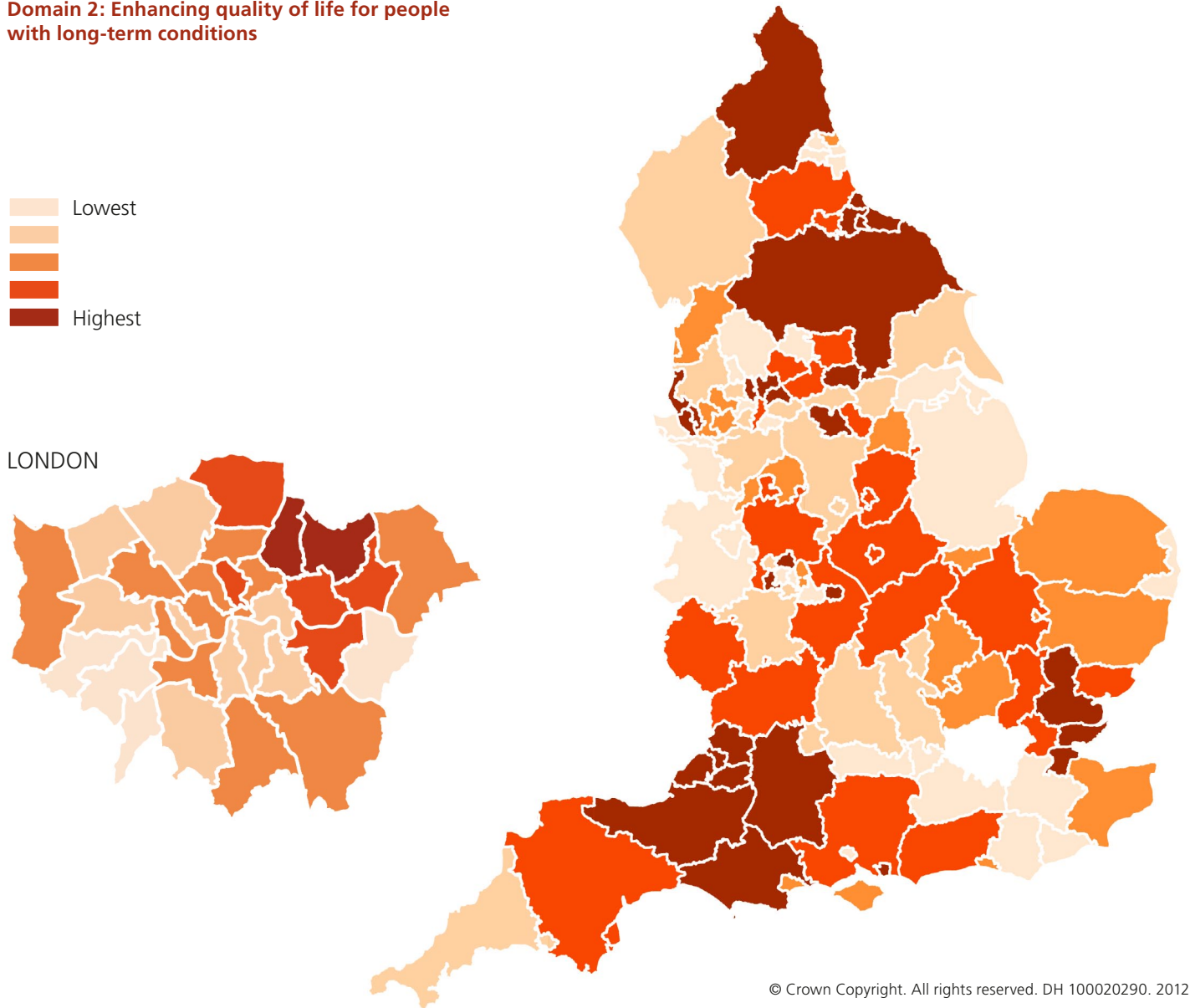
Map 16: Rate of sleep studies undertaken per population by PCT

2011

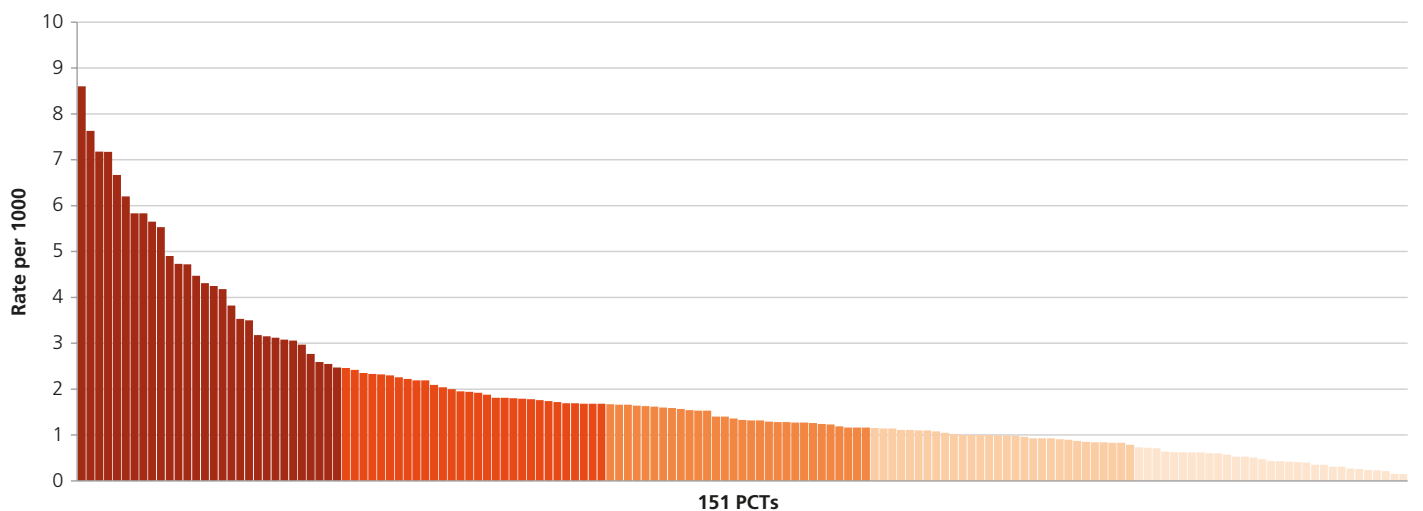
Domain 2: Enhancing quality of life for people with long-term conditions



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Context

Sleep physiology investigations are conducted to identify abnormal sleep patterns and pathologies, and to assess and provide therapeutic intervention. Sleep disorders are very common and can vary from mild to life-threatening. There are more than 80 recognised sleep disorders, which may affect the timing, quality and quantity of sleep. The most common are sleep hygiene issues, insomnia, parasomnias, sleep apnoea, restless leg syndrome, narcolepsy and other neurological problems.

Obstructive sleep apnoea (OSA) syndrome has conservative prevalence estimates of 1–2%, although the vast majority of people suffering from this disorder are undiagnosed. In this condition, the upper airway becomes narrowed or occluded, resulting in under-breathing (hypopnoeas) or cessation of breathing (apnoeas). The events cause arousal from sleep resulting in impaired quality of life, daytime sleepiness and increased accidents. Furthermore, there are several cardiovascular and metabolic consequences, including hypertension, stroke, cardiac problems and diabetes.

There has been an increase in the commissioning of sleep studies over the last five years (see Figure 16.1) partly because of initiatives to clear waiting list backlogs. Despite this, access to diagnostic assessment for people with sleep disorders remains patchy; failure to diagnose is common, and intervention rates remain low relative to the prevalence of sleep problems.

Magnitude of variation

For PCTs in England, the rate of sleep studies undertaken ranges from 0.2 to 8.6 per 1000 population (57-fold variation). When the five PCTs with the highest rates and the five PCTs with the lowest rates are excluded, the range is 0.3–6.2 per 1000 population, and the variation is 24-fold (see Table 16.1 for 2010 data).

Variation in the rate of sleep studies can be explained by two main factors:

- Symptom recognition and appropriate referral in primary care;
- The availability of the service for commissioners.

In localities where there are large sleep centres, the rates of testing for sleep-related conditions tend to be higher probably because large sleep centres:

- work closely with local commissioners to raise awareness of the problem;
- are likely to have a clear funding model for the subsequent therapeutic intervention.

Options for action

To help reduce unwarranted variation, commissioners need to review referral and delivery models for sleep services, and consider the interventions in Box 16.1.

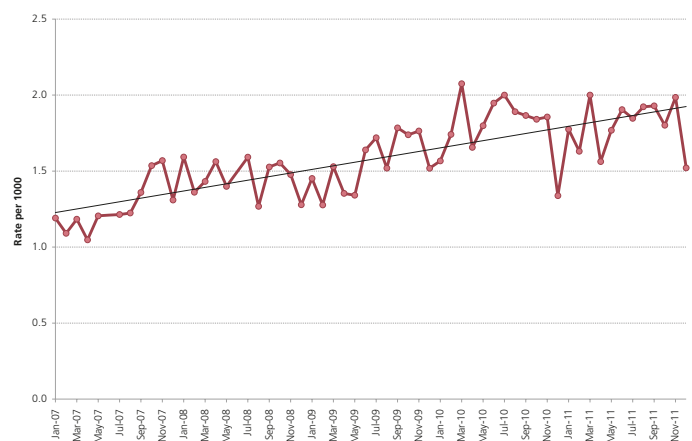
Box 16.1: Reducing unwarranted variation in the commissioning of sleep studies

- Improve understanding of expected and observed prevalence of sleep-related conditions
- Raise awareness in primary care to promote prompt referral
- Assess the demand for and capacity of local sleep services
- Review provision models for initial diagnostic testing and triage approaches to referral management
- Review funding models (e.g. block contract versus payment by results) to ensure there are no perverse financial incentives to commission inappropriately

RESOURCES

- Department of Health – 18 weeks team (2009) Transforming Respiratory and Sleep Diagnostic Services. A Good Practice Guide. http://www.improvement.nhs.uk/physiologydiagnostics/documents/RespiratoryGoodPractice_060209.pdf
- NICE (2008) Sleep apnoea – continuous positive airway pressure (CPAP) (TA139): Continuous positive airway pressure for the treatment of obstructive sleep apnoea/hypopnoea syndrome. <http://publications.nice.org.uk/continuous-positive-airway-pressure-for-the-treatment-of-obstructive-sleep-apnoeahypopnoea-ta139/clinical-need-and-practice>
- Scottish Intercollegiate Guidelines Network (SIGN) – endorsed by the British Thoracic Society (BTS) (2003) Management of Obstructive Sleep Apnoea/Hypopnoea Syndrome in Adults. A national clinical guideline. <http://www.sign.ac.uk/pdf/sign73.pdf>

Figure 16.1: Annual intervention rate for sleep studies by month from January 2007 to December 2011



Data for June 2007 and June 2008 have been removed due to data quality.

Table 16.1: Rate of sleep studies undertaken per 1000 population by PCT over two calendar years

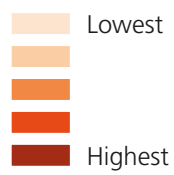
Date	Range before exclusions	Fold difference before exclusions	Range after exclusions	Fold difference after exclusions	Notes
2010	0.1–7.8	60	0.2–6.0	27	Map 35, Atlas 2.0 (2011)
2011	0.2–8.6	57	0.3–6.2	24	

BRONCHIOLITIS

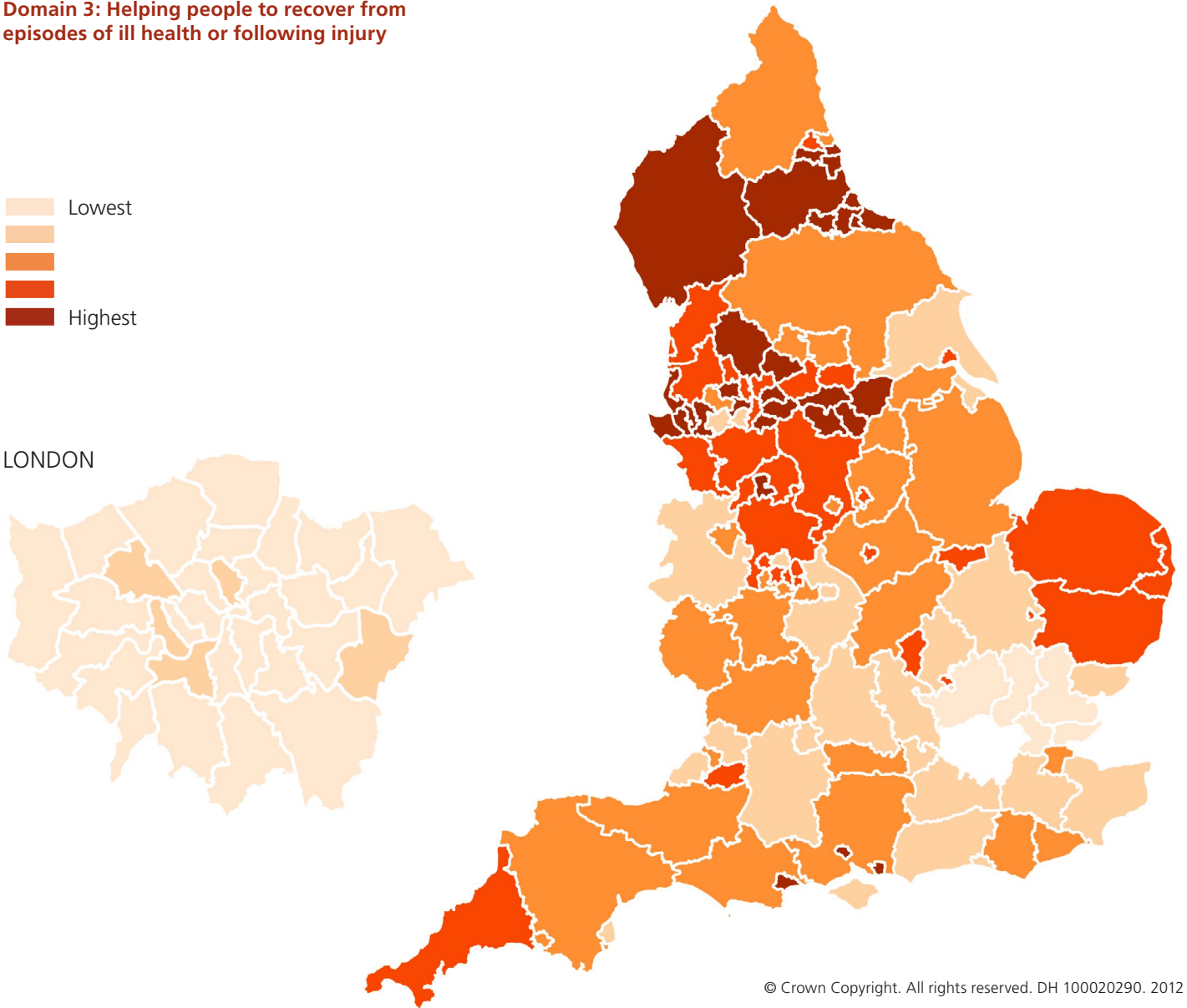
Map 17: Rate of admissions for bronchiolitis in children per population aged under 2 years by PCT

2008/09–2010/11

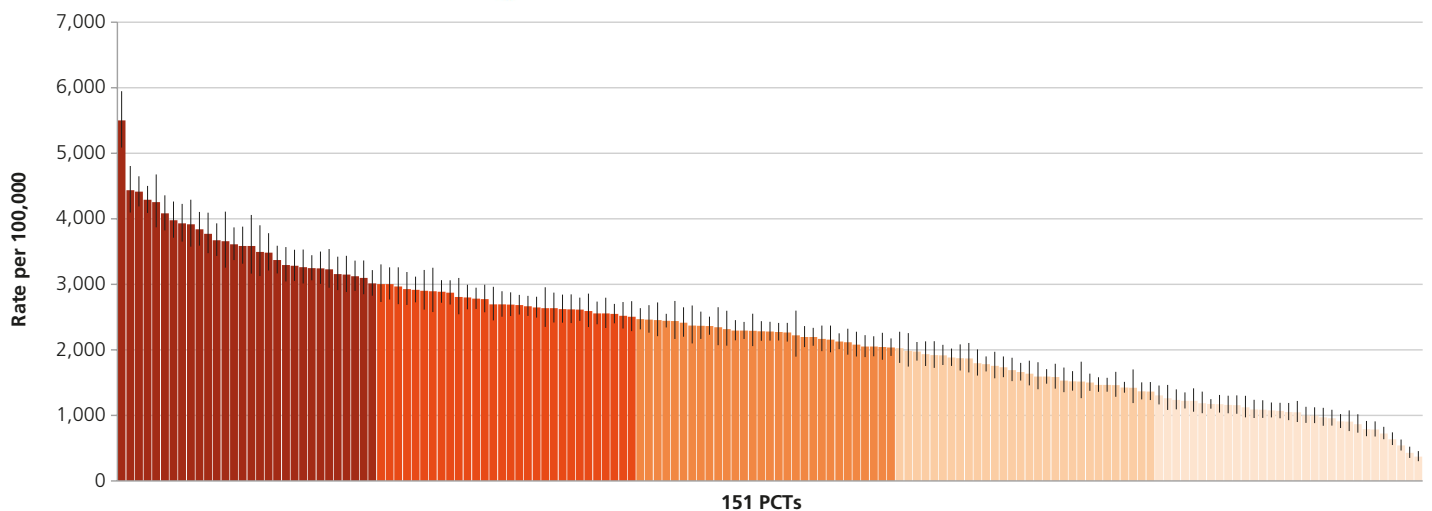
Domain 3: Helping people to recover from episodes of ill health or following injury



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Context

Bronchiolitis is a viral respiratory infection of the lower airways, predominantly affecting infants under one year, and occasionally up to two years. In industrialised countries, 1–3% of all infants are admitted to hospital as a result of bronchiolitis.¹ Human respiratory syncytial virus (RSV) is the most common cause of bronchiolitis in infants, and the single most common cause of hospital admissions in infancy.² Globally RSV is the most common cause of childhood acute and severe lower respiratory tract infections and a cause of substantial mortality.³

The incidence of bronchiolitis tends to be seasonal: most cases in England occur in winter. The majority of children with bronchiolitis do not require admission to hospital; those that do often require feeding therapy and/or supplemental oxygen therapy. Seasonal preventative treatment of a selected population of at-risk children (e.g. with pre-existing lung disease or significant congenital heart disease) with monthly injections of monoclonal antibody are clinically beneficial and cost-effective.⁴ Best-practice guidance covers admission criteria for and inpatient management of children with bronchiolitis (see “Resources”).

Magnitude of variation

For PCTs in England, the rate of admissions for bronchiolitis in children ranged from 369.7 to 5500.4 per 100,000 population aged under 2 years (15-fold variation). When the five PCTs with the highest rates and the five PCTs with the lowest rates are excluded, the range is 784.2–4081.4 per 100,000 population aged under 2 years, and the variation is 5-fold.⁵

Variations in admissions for children with bronchiolitis may reflect various epidemiological factors, including socio-economic deprivation, maternal tobacco-smoking during pregnancy, and household tobacco-smoking status.⁶ There is only a modest correlation between frequency of admission and levels of socio-economic deprivation ($r=0.30$; see Figure 17.1). Thus, deprivation cannot be the sole explanation for the degree of variation observed. A comparison of the 10 most-deprived PCTs shows a 15-fold variation in rates of admission for bronchiolitis, and a 2.7-fold variation among the 10 least-deprived PCTs (see Figure 17.2, page 60).

Possible reasons for unwarranted variation are differences in the management and assessment of children with bronchiolitis in the emergency department and clinical admissions criteria of local departments. Providing supported discharge, and clear “safety-net” advice, to reduce length of stay alleviates the overall burden of bronchiolitis admissions on hospitals but at the cost of an expected increase in re-admissions. Variation in admission rates needs to be interpreted taking into account length of stay (see Map 18, page 54).

Options for action

Local clinicians, in particular, emergency department practitioners and paediatricians, need to apply:

- evidence-based guidance for the assessment of children with respiratory illness;
- admission criteria for children presenting with bronchiolitis based on national evidence-based guidelines and reviews of the most recent literature.

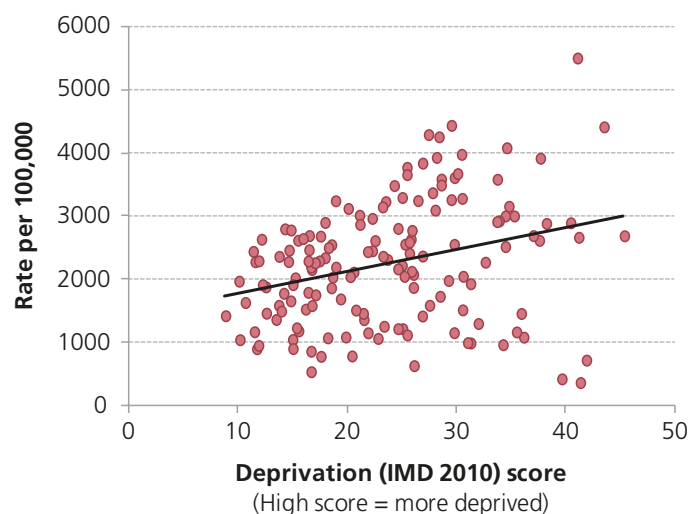
Introduction of a clinical care pathway reduces variation in the treatment of bronchiolitis, from admission to discharge.⁷

Clinicians, supported by commissioners, need to ensure all at-risk children receive prophylaxis against RSV according to Department of Health guidance (see “Resources”): mechanisms are required to deliver treatment to those presenting to healthcare services and to identify and contact families of at-risk children to ensure the children are protected.

RESOURCES

- Scottish Intercollegiate Guidelines Network (SIGN) (2006) Bronchiolitis in children. A national clinical guideline. <http://www.sign.ac.uk/pdf/sign91.pdf>
- Joint Committee on Vaccination and Immunisation (JCVI) (23 July 2010) Statement on immunisation for Respiratory Syncytial Virus. http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/@dh/@ab/documents/digitalasset/dh_120395.pdf
Amended paragraphs 12 and 13 (15 December 2010) http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/@dh/@ab/documents/digitalasset/dh_122751.pdf
- Department of Health (2006; updated 2011) Immunisations against infectious diseases (“Green Book”). Chapter 27a – Respiratory Syncytial Virus. http://webarchive.nationalarchives.gov.uk/+www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/@dh/@en/documents/digitalasset/dh_133118.pdf

Figure 17.1: Correlation between rate of admissions for bronchiolitis in children per 100,000 population aged under 2 years by PCT 2008/09–2010/11 and deprivation



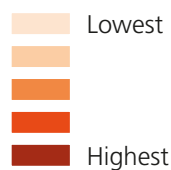
- 1 Leader S, Kohlhas K (2002) Respiratory syncytial virus-coded pediatric hospitalizations, 1997 to 1999. *Pediatric Infectious Disease Journal* 21: 629–632.
- 2 Deshpande SA, Northern V (2003) The clinical and health economic burden of respiratory syncytial virus disease among children under 2 years of age in a defined geographical area. *Archives of Diseases in Childhood* 88:1065–1069.
- 3 Nair H et al (2010) Global burden of acute lower respiratory infections due to respiratory syncytial virus in young children: a systematic review and meta-analysis *Lancet* 375:1545–1555.
- 4 Scottish Intercollegiate Guidelines Network (SIGN) (2006) Bronchiolitis in children. A national clinical guideline. <http://www.sign.ac.uk/pdf/sign91.pdf>
- 5 A directly standardised, as opposed to a crude, rate was presented for this indicator using data for 2007/08–2009/10 in the Child Health Atlas (see Map 20, pages 58–59).
- 6 Semple MG, Taylor-Robinson DC, Lane S, Smyth RL (2011) Household Tobacco Smoke and Admission Weight Predict Severe Bronchiolitis in Infants Independent of Deprivation: Prospective Cohort Study. *PLoS ONE* 2011; 6(7): e22425. doi:10.1371/journal.pone.0022425
- 7 Walker C, Danby S, Turner S (2011) Impact of a bronchiolitis clinical care pathway on treatment and hospital stay. *European Journal of Paediatrics* (2011) doi: 10.1007/s00431-011-1653-9

BRONCHIOLITIS

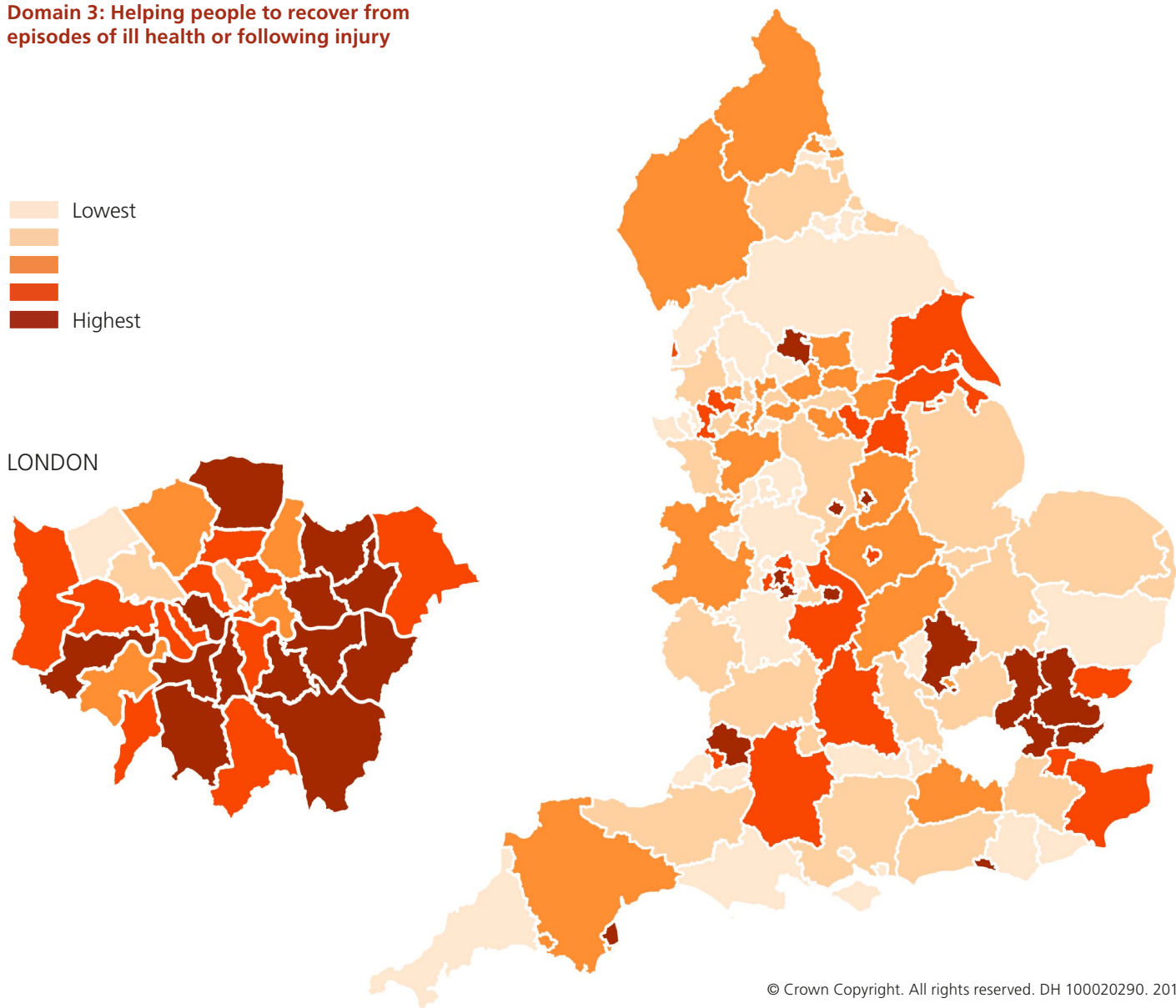
Map 18: Mean length of stay (days) for bronchiolitis in children aged under 2 years by PCT

2008/09–2010/11

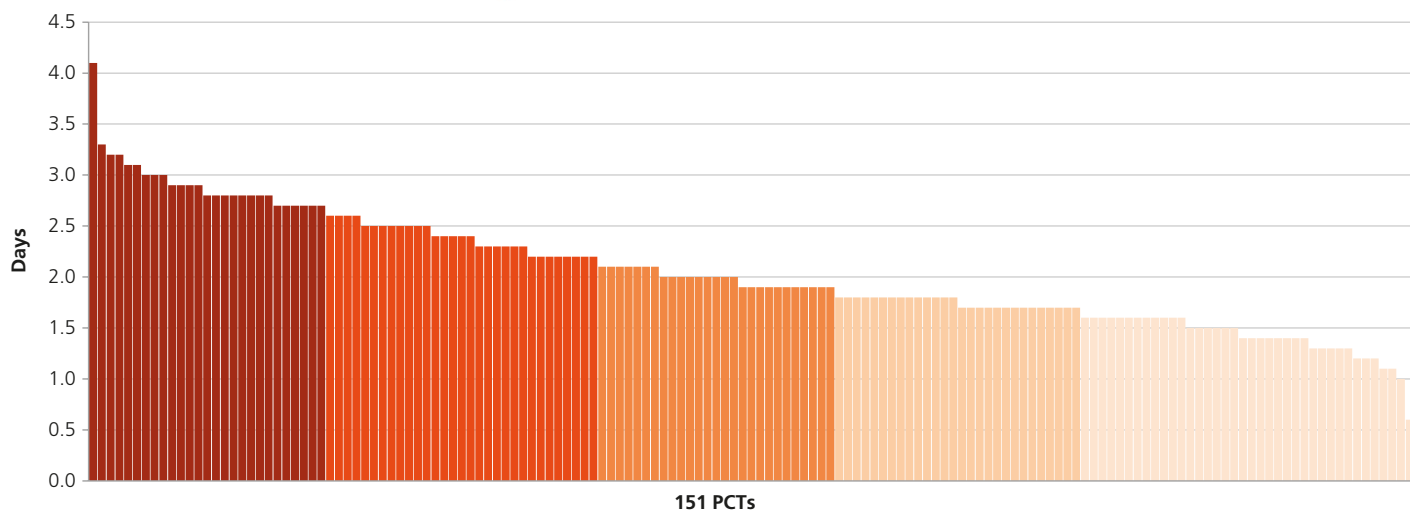
Domain 3: Helping people to recover from episodes of ill health or following injury



LONDON



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Context

Bronchiolitis is the most common cause of hospital admission of infants during winter in industrialised countries.^{1,2}

Duration of admission is partly a function of the severity of illness; it could also be related to differences in:

- › clinical management;
- › thresholds for discharge from hospital;
- › the quality of support from primary care and community and social care that is available to families during the infant's recovery period.

Prolonged hospital admission of young children disrupts family life, and affects the well-being of the child and their family, including the financial impact of time off work. The seasonal epidemic nature of admissions for bronchiolitis also means that unnecessarily prolonged inpatient stays place demands upon healthcare resources at a time of year when there are already increased service pressures.

Magnitude of variation

For PCTs in England, the mean length of stay for bronchiolitis in children aged under 2 years ranged from 0.6 to 4.1 days (7-fold variation). When the five PCTs with the highest mean lengths of stay and the five PCTs with the lowest mean lengths of stay are excluded, the range is 1.2–3.1 days, and the variation is 2.6-fold (for 2007/08–2009/10 data, see Table 18.1).

There does not appear to be a simple relationship between socio-economic deprivation and mean length of stay.³ The degree of variation observed cannot be attributed predominantly to variation in levels of deprivation. Differences in local practice are likely to account for a considerable proportion of the variation in the lengths of inpatient stay.

Therapies for bronchiolitis are mainly supportive, involving:

- › nasogastric tube feeding;
- › supplemental oxygen;
- › in severe cases, mechanical ventilator support.

There may be differences in local guidelines, particularly the criteria for starting and stopping supplemental oxygen, as well as variation in the clinical criteria for discharge of children with bronchiolitis.⁴

Table 18.1: Mean length of stay (days) for bronchiolitis in children aged under 2 years by PCT over two time-periods (moderately strong association: $r=0.74$; $p<0.00005$)

Date	Range before exclusions	Fold difference before exclusions	Range after exclusions	Fold difference after exclusions	Notes
2007/08–2009/10	0.7–4.1	6	1.3–3.3	2.6	Map 21, Child Health Atlas
2008/09–2010/11	0.6–4.1	7	1.2–3.1	2.6	

- 1 Leader S, Kohlhase K (2002) Respiratory syncytial virus-coded pediatric hospitalizations, 1997 to 1999. *Pediatric Infectious Disease Journal* 21: 629–632.
- 2 Deshpande SA, Northern V (2003) The clinical and health economic burden of respiratory syncytial virus disease among children under 2 years of age in a defined geographical area. *Archives of Diseases in Childhood* 88:1065–1069.
- 3 De Debrasi D, Pannuti F, Antonelli F et al (2010) Therapeutic approach to bronchiolitis: why pediatricians continue to overprescribe drugs. *Italian Journal of Pediatrics* 36: 67.
- 4 Unger S, Cunningham S (2008) Effect of oxygen supplementation on length of stay for infants hospitalized with acute viral bronchiolitis. *Pediatrics*. doi:10.1542/peds.2007-1135
- 5 Zhang L, Mendoza-Sassi RA, Wainwright C et al (2008) Nebulized hypertonic saline solution for acute bronchiolitis in infants. *Cochrane Database of Systematic Reviews*, 2008 (Issue 4).
- 6 Walker C, Danby S, Turner S (2011) Impact of a bronchiolitis clinical care pathway on treatment and hospital stay. *European Journal of Paediatrics* (2011) doi: 10.1007/s00431-011-1653-9

Differences in discharge criteria could also reflect:

- › discharge processes for all children in the local department, hospital or provider unit;
- › level of support available in the local community.

A family's capacity to care for a recovering infant at home may influence a clinician's decision whether to discharge a child with bronchiolitis. The level of support available locally from the extended family, and community health and social services may account for some of the variation observed.

Options for action

All departments admitting children with bronchiolitis need:

- › To use evidence-based guidelines for inpatient management;
- › To have clear thresholds for discharge of children with bronchiolitis, based on existing evidence-based national guidelines (see "Resources") that are regularly reviewed to take account of up-to-date evidence on effective treatments to reduce length of stay (e.g. nebulised hypertonic 3% saline⁵).

To identify factors responsible for variations in the duration of admission for bronchiolitis in the local population, commissioners and providers need to investigate the differences in:

- › clinical management of bronchiolitis;
- › wider hospital processes and patient flows.

Introduction of a clinical care pathway has been shown to reduce variation in the treatment of bronchiolitis, and significantly reduce variation in duration of admission.⁶

Commissioners need to ensure that vulnerable children and families have ready access to adequate support to facilitate recovery in the community after discharge.

RESOURCES

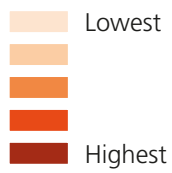
- › Scottish Intercollegiate Guidelines Network (SIGN) (2006) Bronchiolitis in children. A national clinical guideline. <http://www.sign.ac.uk/pdf/sign91.pdf>

PRESCRIBING

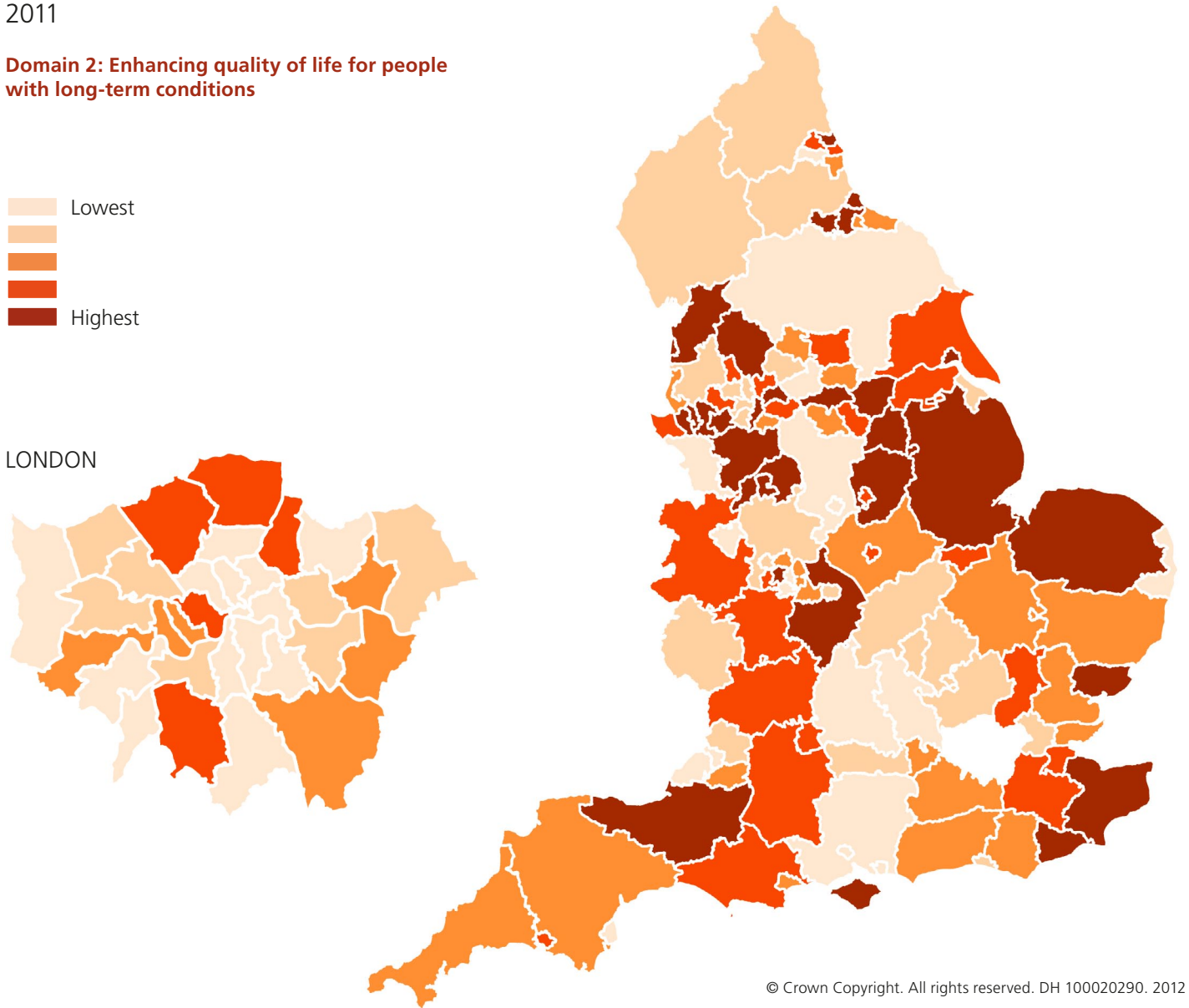
Map 19: Average daily quantity (ADQ) of combination (ICS and LABA) inhalers per patients on GP COPD and Asthma registers by PCT

2011

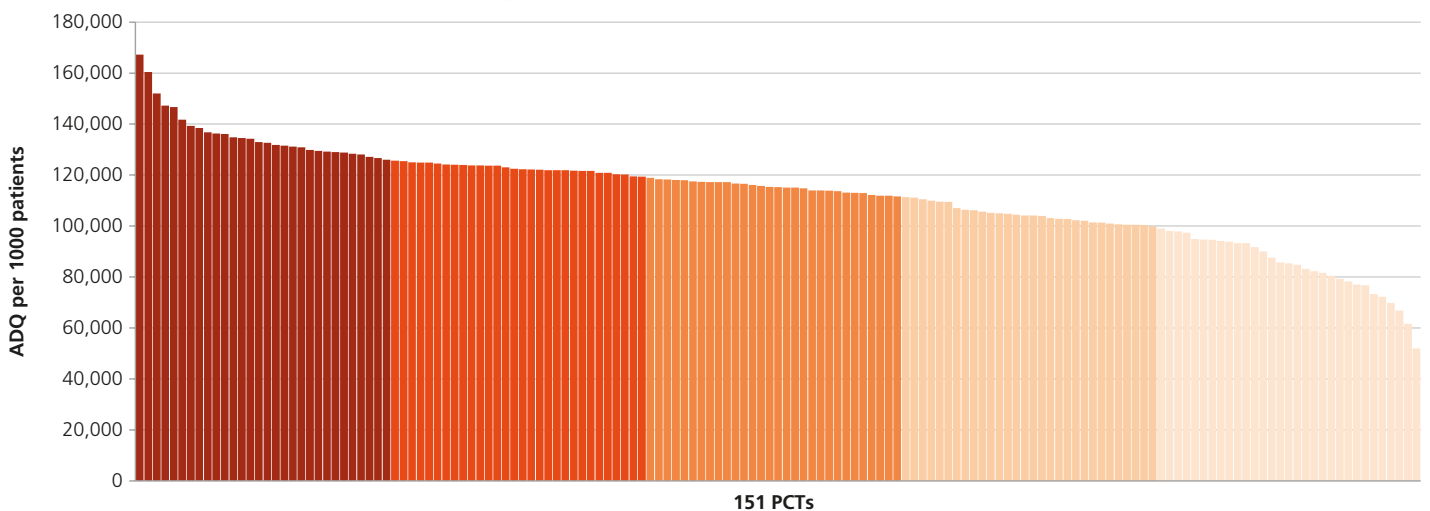
Domain 2: Enhancing quality of life for people with long-term conditions



LONDON



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Context

Many respiratory medications are prescribed for both asthma and COPD: when analysing prescribing patterns, it is often impossible to distinguish between the two conditions. In the management of asthma, inhaled corticosteroids (ICS) and long-acting beta-agonists (LABA) have a clearly defined role in improving symptom control and quality of life, and in reducing exacerbations and hospitalisations. The BTS/SIGN asthma guideline offers a clear step-wise approach to initiating these drugs, increasing the dose to achieve symptom control, and decreasing or discontinuing if the drug is ineffective or the patient improves (see "Resources"). Reducing high doses of ICS once a patient is stable is important because high doses are associated with risks of pneumonia, diabetes and osteoporosis.

For COPD, NICE advocates the use of ICS in combination with LABA in clearly defined patient groups to improve symptoms and quality of life, and to reduce the frequency of exacerbations (see "Resources").

When used appropriately, combination inhalers have a clear evidence base. However, they are very expensive: three of the top five highest spend items prescribed in England are respiratory inhalers.

To adjust for disease prevalence, the average daily quantity (ADQ) of all LABA/ICS combination inhalers per 1000 patients on GP COPD and Asthma registers has been used.

Magnitude of variation

For PCTs in England, the ADQ of combination (ICS and LABA) inhalers ranged from 51,954 to 167,259 ADQ per 1000 patients on GP COPD and Asthma registers (3.2-fold variation). When the five PCTs with the highest ADQs and the five PCTs with the lowest ADQs are excluded, the range is 73,260 to 141,695 per 1000 patients on GP COPD and Asthma registers, and the variation is 1.9-fold.

Average values at PCT level mask the much greater degree of variation among practices within PCTs. Furthermore, the highest potency steroid combinations (with 2000 mcg beclometasone equivalence average daily dose) comprise the majority of combination ICS/LABA prescriptions. There are several potential reasons for this, as follows.

- A large proportion of patients do not use their inhalers correctly thereby reducing effectiveness. Clinicians often respond to treatment failure by increasing the dose rather than correcting inhaler technique.
- Many patients have inhaler doses increased to the maximum during exacerbations to achieve symptom control but doses are not reduced once patients are stable.
- There is some unlicensed use of high-potency aerosol combinations in COPD possibly due to lack of familiarity with guideline recommendations among some clinicians.

Options for action

Commissioners and providers need to support clinicians in the implementation of evidence-based practice through training and education, local medicines management initiatives and computer prompts.

Clinicians can improve the clinical effectiveness and cost-effectiveness of respiratory prescribing through responsible guidance-based prescribing (see Box 19.1), which is likely to improve patients' quality of life, reduce the risk of deterioration sufficient to require hospitalisation, reduce the risk of harm from ICS, and reduce expenditure.

Box 19.1: Improving the clinical effectiveness and cost-effectiveness of respiratory prescribing

- Ensure patients receive the optimal dose of inhaled treatment for their stage of disease according to published guidelines; dose needs to be reviewed regularly
- Once patients are judged to be stable, where appropriate, step down doses of ICS
- Before any dose increase, check, and correct, patients' adherence to treatment and inhaler technique (+/- use of spacers)
- Consider non-pharmaceutical evidenced-based interventions (e.g. stopping smoking or pulmonary rehabilitation) in preference or in addition to increasing medicines
- Encourage and support patient self-management

See Case-study 9, page 69, and Case-study 10, page 70.

RESOURCES

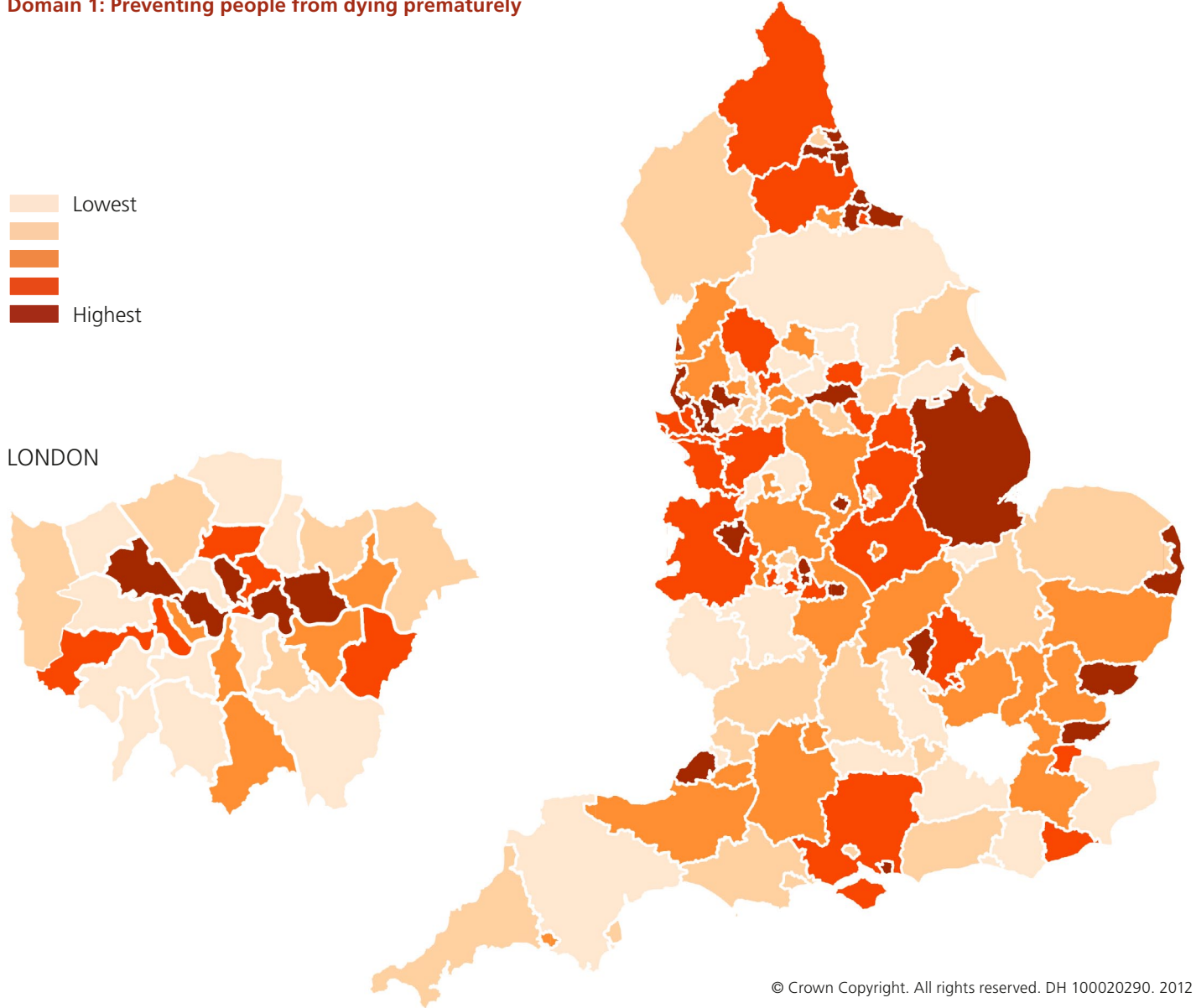
- Scottish Intercollegiate Guidelines Network and British Thoracic Society (2008; revised 2012) British Guideline on the Management of Asthma. A national clinical guideline. <http://www.sign.ac.uk/pdf/sign101.pdf>
- NICE Guidance (2010) Chronic obstructive pulmonary disease (updated) (CG101) Management of chronic obstructive pulmonary disease in adults in primary and secondary care. <http://guidance.nice.org.uk/CG101>
- NICE (2011) Chronic obstructive pulmonary disease quality standard. <http://www.nice.org.uk/guidance/qualitystandards/chronicobstructivepulmonarydisease/copdqualitystandard.jsp>
- Department of Health (2011) An outcomes strategy for people with chronic obstructive pulmonary disease (COPD) and Asthma in England. http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_127974
- Department of Health (2012) An Outcomes Strategy for COPD and Asthma: NHS Companion Document. http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_134000
- NHS Medical Directorate (2012) COPD Commissioning Toolkit. A Resource for Commissioners. <https://www.wp.dh.gov.uk/publications/files/2012/08/chronic-obstructive-pulmonary-disease-COPD-commissioning-toolkit.pdf>

SMOKING CESSATION

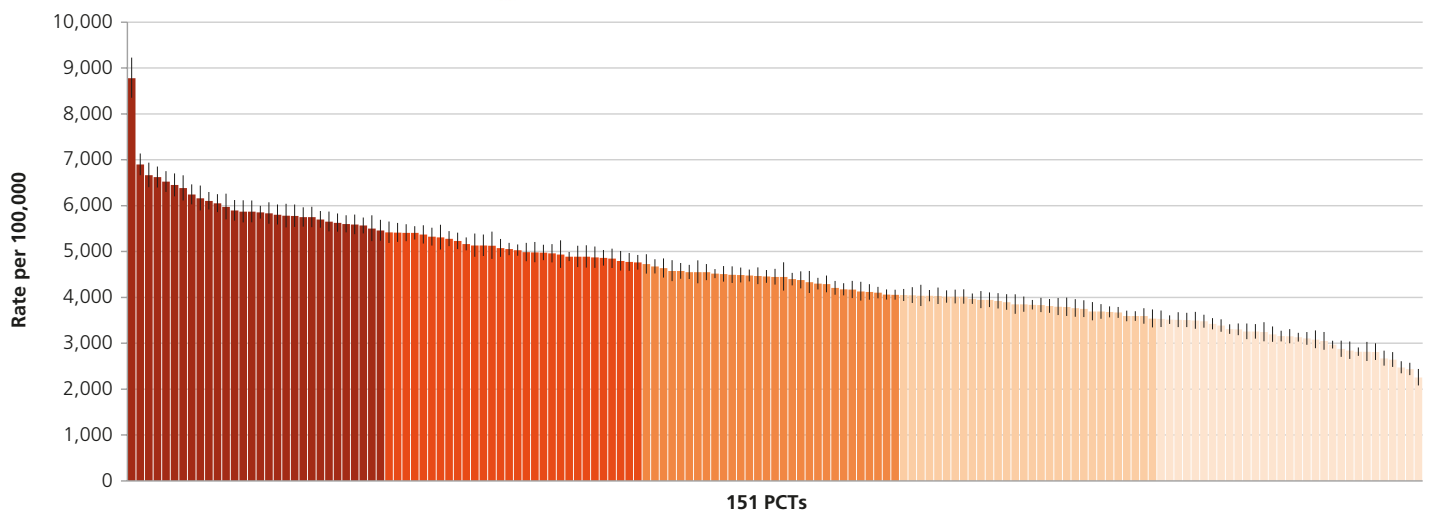
Map 20: Rate of successful smoking quitters at 4 weeks per population of smokers aged 16 years and over by PCT

2010/11

Domain 1: Preventing people from dying prematurely



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Context

Tobacco-smoking is the principal cause of preventable death and disability in England. It is the main reason for the gap in healthy life-expectancy between higher and lower socio-economic groups.

It is estimated that COPD affects around 3 million people in England: 85% of cases are caused by smoking. There is a substantial socio-economic gradient in:

- › smoking prevalence;
- › mortality from COPD.

Smoking prevalence is much higher in people with mental health problems.

Smoking increases the risk of developing asthma, and asthma severity. Direct or passive exposure to cigarette smoke adversely affects lung function, reduces the effectiveness of inhaled therapy and increases exacerbation rate and mortality risk in people with asthma.

Smoking cessation is not solely a primary prevention intervention. For people who already have a respiratory condition, support to stop smoking is a core treatment because it improves lung function, and, in COPD, it increases survival (see Figure 20.1).

Support to stop smoking is inexpensive, and considerably more cost-effective in the management of respiratory conditions than many routinely used treatments.

Magnitude of variation

For PCTs in England, the rate of successful smoking quitters at 4 weeks ranged from 2253.3 to 8779.1 per 100,000 smokers aged 16 years and over (3.9-fold variation). When the five PCTs with the highest rates and the five PCTs with the lowest rates are excluded, the range is 2811.7–6447.9 per 100,000 smokers aged 16 years and over, and the variation is 2.3-fold.

The degree of variation observed suggests that some PCTs are more effective than others at supporting smoking cessation.

Options for action

People with COPD, asthma and other respiratory conditions have frequent interactions with healthcare professionals, each of which offers a key opportunity to support smoking cessation. In NICE guidance, it is recommended that GPs

and nurses in primary and community care and clinicians in secondary care should routinely advise patients who smoke to quit, and to offer referral to smoking-cessation support (see “Resources”). People who smoke are substantially more likely to be successful in a quit attempt if they have professional support than if they try to quit on their own.

Interventions that commissioners and providers can undertake to increase the offer and uptake of smoking-cessation services are shown in Box 20.1.

Box 20.1: Increasing the offer and uptake of smoking-cessation services

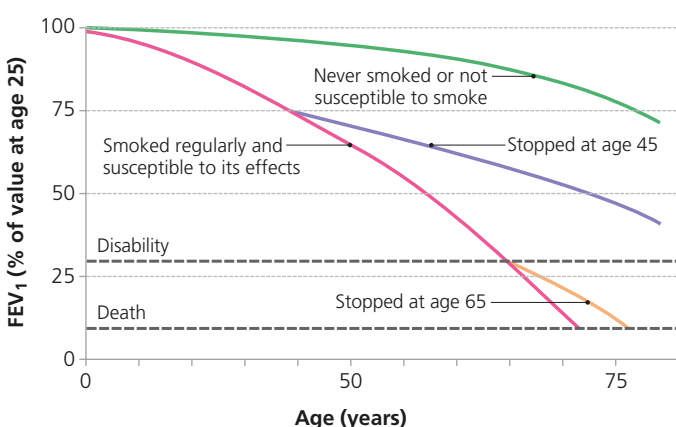
- › Ensure that local care pathways recommend smoking cessation advice and referral to specialist smoking cessation services at key trigger points in the patient journey: e.g. routine chronic disease management review, outpatient attendance, acute exacerbation, emergency department attendance, hospital admission, and hospital discharge
- › Encourage all acute and mental health Trusts to have Trust-wide policies to support smoking cessation in patients and staff, and use initiatives such as smoking cessation champions (see “Resources”)
- › Ensure that clinical staff in primary and emergency care are trained to deliver brief interventions to support smoking cessation
- › Ensure that smoking-cessation support is included in acute care and discharge bundles
- › Consider population-level social marketing to ensure maximum reach of smoking-cessation interventions

See Case-study 11, page 71.

RESOURCES

- › Department of Health (2011) An outcomes strategy for people with chronic obstructive pulmonary disease (COPD) and Asthma in England. http://www.dh.gov.uk/en/PublicationsandStatistics/Publications/PublicationsPolicyAndGuidance/DH_127974
- › Department of Health (2012) An Outcomes Strategy for COPD and Asthma: NHS Companion Document. http://www.dh.gov.uk/en/PublicationsandStatistics/Publications/PublicationsPolicyAndGuidance/DH_134000
- › NICE Guidance (2006) Brief interventions and referral for smoking cessation: Brief interventions and referral for smoking cessation in primary care and other settings (PH1). <http://www.nice.org.uk/Guidance/PH1>
- › NICE Guidance (2008) Smoking cessation services: Smoking cessation services in primary care, pharmacies, local authorities and workplaces, particularly for manual working groups, pregnant women and hard to reach communities (PH10). <http://www.nice.org.uk/Guidance/PH10>
- › National Centre for Smoking Cessation and Training. <http://www.ncsct.co.uk/>
- › NHS Medical Directorate (2012) COPD Commissioning Toolkit. A Resource for Commissioners. <https://www.wp.dh.gov.uk/publications/files/2012/08/chronic-obstructive-pulmonary-disease-COPD-commissioning-toolkit.pdf>
- › Quality Intelligence East. INHALE – Interactive Health Atlas for Lung conditions in England. <http://www.inhale.nhs.uk/>
- › British Thoracic Society. BTS Stop Smoking Champions Programme. <http://www.brit-thoracic.org.uk/delivery-of-respiratory-care/stop-smoking-champions.aspx>

Figure 20.1: Potential to increase survival in people with COPD who quit smoking



Additional visualisations for Maps 14 and 17

Figure 14.2: Emergency admission rate for children with asthma per 100,000 population aged 0–17 years 2010/11 among the 10 least-deprived and the 10 most-deprived PCTs (IMD 2010)

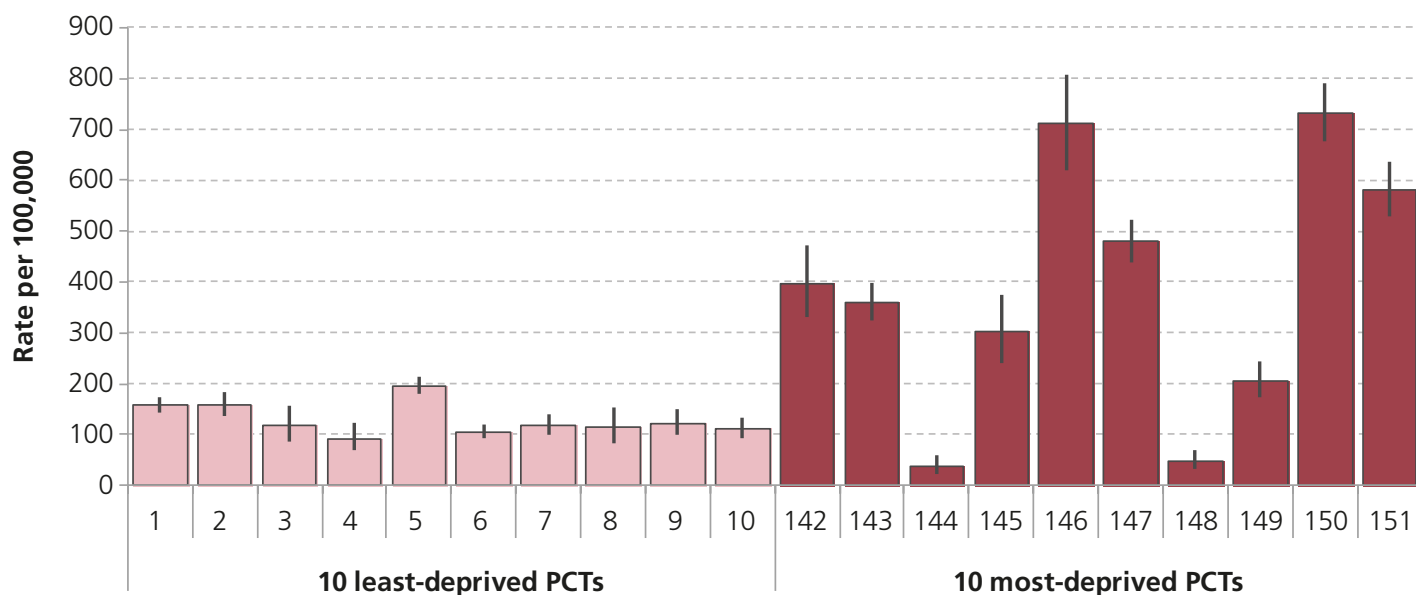
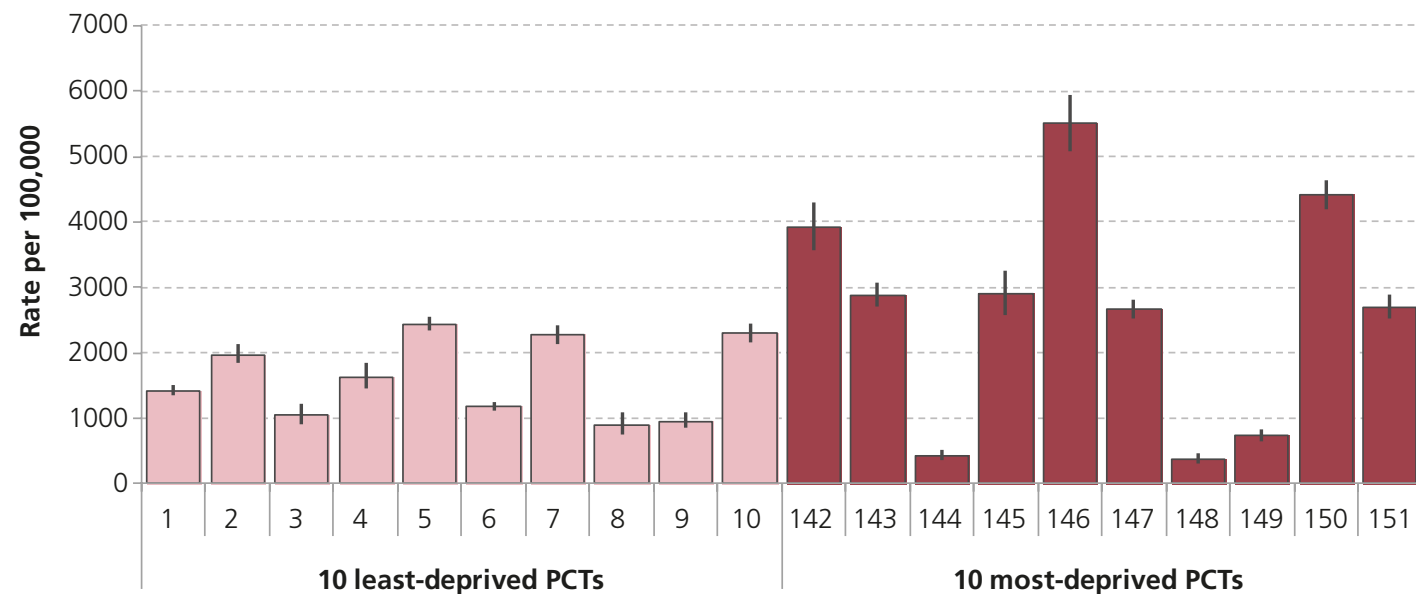


Figure 17.2: Rate of admissions for bronchiolitis in children per 100,000 population aged under 2 years 2008/09–2010/11 among the 10 least-deprived and the 10 most-deprived PCTs (IMD 2010)



Case-study 1: COPD Case-finding project

Setting

Highfield Surgery, Hemel Hempstead

The problem

At Highfield Surgery, the recorded COPD prevalence was found to be 0.7%, which is substantially lower than the expected prevalence of around 2%. Clinicians at the surgery recognised that they must have a considerable number of patients with undiagnosed and symptomatic disease.

What action was taken?

To target patients who are more likely to have COPD, clinicians at the practice applied a smoking-load calculator (pack-years) to patients over 40 years of age, and focused on people with a smoking history of 15 pack-years or more. Clinicians at the practice reasoned that full diagnostic spirometry for all patients would not be a cost-effective way of identifying people with COPD.

They therefore used microspirometers, which provide a rapid estimate of FEV₁ and FEV₆:

- people with normal results are very unlikely to have airflow obstruction and do not need further investigation;
- people with abnormal results (around 20% of the total) can be targeted to proceed to full diagnostic spirometry.

The practice offered the microspirometry test as a 'free lung check' on an opportunistic basis to patients with a smoking load of 15 or more pack-years. Initially the test was conducted by the practice respiratory nurse, but other staff members have now been trained in order to increase access to the intervention.

Outcome

As a result of this case-finding project, the practice prevalence of COPD increased from 0.7% to 1.5%.

Case-study 2: Maximising the reach of the Quality and Outcomes Framework (QOF)

Setting

Cheadle Medical Practice, Stockport

The problem

At Cheadle Medical Practice, it was found that although they were achieving maximum Quality and Outcomes Framework (QOF) points, they had a higher exception rate for COPD of 18.5% when compared with the PCT average of 10.9%. Exception rates for asthma were below average.

The commonest reasons for exception-reporting of patients with COPD and patients with asthma were found to be that:

- › Patients were housebound;
- › Patients did not attend (DNA);
- › Patients declined review;
- › Patients were unable to perform spirometry.

What action was taken?

For the financial year 2010/11, clinicians at the practice adopted a structured pro-active approach, including:

- › Establishing a respiratory team of GP, nurse and health care assistant (HCA);

- › Focusing on early identification of those patients previously excepted – the HCA contacted patients by telephone, letter or both on several occasions, persisting until a response was obtained; the HCA explained the importance of the review, and provided patient information leaflets where appropriate;
- › Setting up an active recall system for patients on the register, utilising extended-hours clinics if necessary for appointments;
- › Visiting by the nurse of housebound patients at home to carry out COPD/Asthma review including spirometry if able, or FEV₁ if not;
- › Reviewing medication and co-morbidities to encourage an holistic approach and to discourage further non-attendance.

Outcomes

A pro-active team approach with “zero tolerance” to exceptions resulted in all but three of the patients on the respiratory registers being reviewed appropriately. As a result, in 2010/11:

- › exceptions for asthma were reduced to zero;
- › exceptions for COPD were reduced from 18.5% to 1.7%.

Case-study 3: Integrated COPD services across 14 PCTs

Setting

Fourteen PCTs in the East of England

The problem

COPD is the second most common cause of emergency admission to hospital. Most care for people with COPD is delivered in primary care, but hospitalisation is sometimes necessary during exacerbations or flare-ups. However, although many admissions could be prevented by pro-active coordinated care, the care provision across the East of England was seen to be reactive and fragmented. It was considered that better integration of care would result in improved outcomes for patients and better value for the NHS.

What action was taken?

Integrated care was developed in the 14 PCTs in the East of England by commissioning integrated services and the introduction of innovations by local providers and commissioners. This work has been facilitated by the local respiratory networks in each PCT with the involvement of all provider organisations, commissioners and patients.

Changes that have been instigated include:

- agreeing patient pathways across organisations;
- self-management plans;

- improving continuity of care;
- reducing duplication;
- improving communications;
- developing common information technology (IT) systems;
- multidisciplinary meetings;
- universal availability of pulmonary rehabilitation and home oxygen assessment and review;
- introduction of early-discharge and prevention-of-admission services;
- education initiatives;
- community COPD clinics;
- respiratory consultants involved in community care and education;
- availability of outcome data through INHALE.

Outcomes

Outcome data from South East Essex after the introduction of an integrated service show:

- a reduction of 19% in COPD admissions;
- a reduction of 24% in COPD bed-days;
- a saving of £650,000 per year.

Case-study 4: Pulmonary rehabilitation

Setting

North East Lincolnshire HOPE Specialist Service

The problem

Pulmonary rehabilitation in appropriate patients improves functional capacity and quality of life and reduces re-admission rates following acute exacerbations or flare-ups. Despite this, referral rates are low and completion rates are low throughout the country.

What action was taken?

The North East Lincolnshire HOPE Specialist Service provides a patient-centred one-stop shop for people with chronic respiratory diseases and older people at risk of falls.

An integral part of this service is an award-winning pulmonary rehabilitation scheme that has been developed in partnership with patients. The service is delivered by a multidisciplinary team, including:

- › Physiotherapists;
- › A specialist nurse;
- › An occupational therapist;
- › A dietician;
- › Physiotherapy assistants.

Patients are also supported by “Pulmonary Rehab Buddies”, expert patients whose role it is:

- › to motivate and encourage other patients;
- › to provide peer/emotional support;
- › to help in the running of the programme;
- › to be an extra “pair of eyes”, monitoring patients during sessions.

The programme provides pulmonary rehabilitation for up to 320 people per year in a purpose-built rehabilitation suite.

Outcomes

Over the period 2005–2010, for individuals completing the pulmonary rehabilitation programme, admission rates and bed-days in the 12 months following pulmonary rehabilitation fell by around 75% when compared with the 12 months preceding entry into the programme. These reductions in admission rates and bed-days were accompanied by:

- › improvements in patients’ exercise capacity;
- › increases in the level of patient satisfaction.

Case-study 5: Home oxygen assessment and review service

Setting

Dudley PCT

The problem

Commissioners at Dudley PCT identified that although home oxygen was a very expensive service, prescription of oxygen was ad hoc and appeared to be based on a subjective judgement of need rather than the objective measurement of hypoxia.

What action was taken?

Dudley PCT commissioned a formal home oxygen assessment and review service as the single point of contact to ensure quality, consistency and appropriateness of oxygen prescribing.

A local pathway for referral and prescription was agreed.

Sixty practices were provided with pulse oximeters so that patients with oxygen saturation below 92% could be routinely identified. These patients were then referred to the home oxygen assessment and review service to undergo a structured assessment and prescription of oxygen in line with the British Thoracic Society guidelines.¹

Patients who were already receiving oxygen therapy were entered onto a register and systematically reviewed by the service to verify that:

- they required oxygen;
- they were receiving the appropriate modality.

Outcomes

The service delivered a substantial increase in both quality and productivity with net savings of £116,382 for the PCT.

1 British Thoracic Society (BTS) Working Group on Home Oxygen Services (2006) Clinical Component for the Home Oxygen Service in England and Wales.
<http://www.brit-thoracic.org.uk/Portals/0/Clinical%20Information/Home%20Oxygen%20Service/clinical%20adultoxygenjan06.pdf>

Case-study 6: Integrated COPD service in a locality

Setting

Salford Royal NHS Foundation Trust, Salford

The problem

Despite a high prevalence of COPD in Salford, with the highest numbers occurring in deprived areas, COPD services were found to be fragmented across primary, secondary and community care in the locality, with wide variations in knowledge and skills amongst health professionals.

Housebound patients with complex and/or severe symptoms were found to be largely excluded from routine care, such as specialist hospital clinics or respiratory nursing, due to a lack of local services.

What action was taken?

NHS Salford commissioned from the Salford Royal NHS Foundation Trust an integrated COPD service in 2007, led by a consultant chest physician and respiratory nurse consultant, with a multidisciplinary team of 15 people.

Two community clinics were set up in areas with the highest COPD prevalence to improve patients' access to care.

A Home Oxygen Team of specialist nurses, with support from a respiratory consultant, was established to support best practice in home oxygen prescription and to monitor practice.

An educational programme to train primary care professionals in the long-term care of patients with COPD was developed for practices, including spirometry training and clinical support through linking practices to a specialist nursing team for advice.

In addition, a COPD winter plan was put into action, in which general advice was given to help practices manage patients better during these pressure months, including self-management plans and prioritising COPD reviews.

Outcomes

When compared with data from 2006/07, in 2009/10, as a result of these improvements:

- unscheduled hospital admissions were reduced by 25%;
- people admitted to hospital were discharged on average three days earlier;
- early supported-discharge cases have increased by 25%;
- total savings of £200,000 per year have been made;
- at the time of writing, 70% of practice nurses and 65% of community matrons/case-managers have been trained to diploma level in COPD.

In addition, 1500 extra cases of COPD have been added to the COPD register through improved case-finding in primary care.

Case-study 7: Pictorial personalised asthma action plans

Setting

Imperial College London and Imperial College NHS Foundation Trust

The context

Personalised asthma action plans are strongly recommended in British asthma guidelines. The evidence is that patients who feel in control of their own condition are more likely to adhere to treatment and to have a statistically significant reduction in both symptoms and need for unscheduled healthcare.¹

In a Cochrane systematic review of self-management, education and regular follow-up,² it was shown that such interventions result in a very significant reduction in hospitalisations for out-of-control asthma, a reduction in night-time symptoms, and a reduction in time off work and school. In the same review, it was found that issuing action plans was a major part of the process.

The problem

In various studies, it has been estimated that only between 3% and 20% of people with asthma actually receive an action plan.³

Furthermore, when action plans are used, they are usually word-based despite the fact that around 15% of the population may not have high levels of health literacy.

What action was taken?

To address this gap in health literacy, a group of health professionals and a medical artist transformed a traditional written action plan into pictures.

The comprehensibility of the pictures was evaluated:

- › as individual images;
- › when the images were combined to form an action plan.

Output

The pictorial action plans are available electronically and can be personalised for each individual patient.

Outcome

The pictorial action plans have been very well received by patients.

RESOURCES

- › The software to develop pictorial action plans is available and free to download at: <http://www1.imperial.ac.uk/medicine/people/m.partridge/>

FURTHER READING

- › Roberts NJ, Mohamed Z, Wong PS, Johnson M, Loh LC, Partridge MR (2009) The development and comprehensibility of a pictorial asthma action plan. *Patient Educ Couns* 74(1); 12-18.
- › Roberts NJ, Evans G, Blenkhorn P, Partridge MR (2010) Development of an electronic pictorial asthma action plan and its use in primary care. *Patient Educ Couns* 80(1); 141-146. doi:10.1016/j.pec.2009.09.040

1 Scottish Intercollegiate Guidelines Network and British Thoracic Society (2008; revised 2012) British Guideline on the Management of Asthma. A national clinical guideline. <http://www.sign.ac.uk/pdf/sign101.pdf>

2 Roy A, Schultz TJ, Carson KV, Smith BJ, Powell H, Wilson A, Walters EH (2011) Asthma selfmanagement education with either regular healthcare professional review or written action plans or both in adults. *Cochrane Database of Systematic Reviews* 2011, Issue 12. Art. No.: CD009479. DOI: 10.1002/14651858.CD009479

3 Partridge M (2004) Written asthma action plans. *Thorax* 59; 87-88 doi:10.1136/thx.2003.016451

Case-study 8: SIMPLE approach to asthma management

Setting

NHS Leicester City

The context

In the SIGN/BTS guidelines, it states that the aim of asthma management is to achieve and maintain control.¹ With the medical treatments currently available, it is possible to achieve control in the majority of patients. However, patients may not be prescribed appropriate medicines and/or can make wrong choices about self-management.

The problem

Leicester City was identified as having very high emergency admission rates for asthma, which were substantially above the national average.

What action was taken?

NHS Leicester City developed a Medicines Use Review (MUR) service. The service was designed to be delivered by community pharmacists for people with asthma. The service is built on the SIMPLE approach to asthma management in order to integrate community pharmacists by involving them in chronic disease management within the healthcare team, as follows:

Signposting
Inhaler technique
Medication review
Peak flow
Lifestyle
Education

By giving patients access to professional support and advice closer to home, pharmacists can fulfil a vital role in patient care. They are able to discuss a patient's condition and existing management with them, undertaking a full medicine review and producing a personalised asthma action plan to help maximise self-management.

An educational toolkit was developed to support pharmacists undertaking the asthma reviews. Training events were delivered and follow-up resources were provided to help the pharmacists recruit patients for the study.

Anticipated outcomes

Implementation of the SIMPLE Medicines Use Review service is expected:

- to reduce the number of asthma exacerbations and hospital admissions;
- to improve the prescribing of cost-effective medicines;
- to reduce the over-prescription of steroids.

1 Scottish Intercollegiate Guidelines Network and British Thoracic Society (2008; revised 2012) British Guideline on the Management of Asthma. A national clinical guideline. <http://www.sign.ac.uk/pdf/sign101.pdf>

Case-study 9: Improving inhaler technique

Setting

Isle of Wight PCT

The problem

Isle of Wight PCT found that it had high levels of emergency admission for asthma and high spend on inhaled medication.

What action was taken?

Isle of Wight PCT decided that simply investing more money in medication would not address the problem, and began to tackle the effectiveness of inhaler use. When used effectively, 20% of the medication in a metered dose inhaler (MDI) reaches the lungs (the other 80% is swallowed), whereas with a poor technique the percentage inhaled falls to between 0% and 10%. Therefore, an intervention to improve inhalation techniques was identified as a cost-effective way of improving patient outcomes.

An audit of the training techniques of healthcare professionals was undertaken and revealed a very low level of performance across the board: 94% of professionals were unable to demonstrate correct inhaler use.

Isle of Wight PCT developed a programme to train healthcare professionals, who received instruction in:

- use of the inhaler;
- patient training;
- assessment of inhaler technique.

Patients receiving training were issued with a training aid to help them maintain the correct technique once their initial training by a healthcare professional was over.

An advertising campaign was mounted to raise awareness among patients to ensure that they received the appropriate training in inhaler technique.

Outcomes

Within the first year of the programme:

- expenditure on selective beta-agonists fell by 22.7% – a saving greater than seven times the initial investment by Isle of Wight PCT;
- prescription numbers fell by 25.2%;
- emergency admissions due to asthma were reduced by 50%.

Case-study 10: Responsible respiratory prescribing messages

Setting

NHS London, London Respiratory Team

The problem

Respiratory medications are costly. For the NHS in England, three of the top five most expensive items prescribed are respiratory inhalers. Inhalers are effective when used correctly, but they are often used incorrectly, and in surveys it has been found that most healthcare professionals do not know how to teach correct inhaler technique.¹ Poor technique can substantially reduce effectiveness and often leads to unnecessary dose increases. At the same time, a patient's need for medication can be reduced by interventions such as smoking cessation and pulmonary rehabilitation.

What action was taken?

A series of responsible respiratory prescribing messages was developed by the London Respiratory Team (see Box CS10.1).

The responsible respiratory prescribing messages have been disseminated widely across London among GPs, nurses, pharmacists and patients. The messages are being incorporated into local clinical guidelines and checklists for community pharmacists to use in their Medicines Use Review consultations and New Medicines Service consultations with respiratory patients.

Outputs

The responsible respiratory prescribing messages have been universally well received in PCTs, clinical commissioning groups (CCGs) and acute trusts.

Three Responsible Respiratory Prescribing groups have been established across healthcare systems in London. Their role is to disseminate the messages further and develop locally tailored implementation plans.

Box CS10.1: Responsible respiratory prescribing messages

1. Respiratory medications are expensive

Doing the Right Things:

2. When prescribing any new respiratory inhaler, ensure that the patient has undergone NICE-recommended support to stop smoking
3. Pulmonary rehabilitation is a cost effective alternative to stepping up to triple therapy and should be the preferred option if available and the patient is suitable.

Doing the Right Things Right:

4. When prescribing any inhaled medication, ensure that the patient has undergone patient centred education about the disease and inhaler technique training by a competent trainer
5. When prescribing an MDI (except salbutamol), ensure that a spacer is also prescribed and will be used
6. When prescribing high dose inhaled corticosteroids (>1000ug BDP equivalent), ensure that the patient is issued with an inhaled steroid safety card
7. No Prednisolone EC prescribing without good clinical reason

Outcome

Recent prescribing data show a reduction in expenditure on inhaled corticosteroids in London over the last two years. This contrasts with an increase or no change in all other regions in England. It is not yet clear what factors other than the responsible respiratory prescribing messages may have influenced this reduction in expenditure in London.

1 Baverstock M, Woodhall N, Maarman V (2010) Do healthcare professionals have sufficient knowledge of inhaler techniques in order to educate their patients effectively in their use? *Thorax* 65 (Suppl 4): A117-A118 doi: 10.1136/thx.2010.150979.45

Case-study 11: Stop-smoking stickers

Setting

East Kent Hospitals University NHS Foundation Trust

The problem

Smoking is a major cause of morbidity and premature mortality. Hospital attendance offers a unique opportunity to help patients stop smoking because it prompts people to think about their health at a time when they are having face-to-face consultations with healthcare professionals. However, it is recognised that provision of support to stop smoking is far from routine when people attend hospital.

What action was taken?

In May 2011, a new referral route was put in place to ensure that patients attending the outpatients departments at the various hospital sites in East Kent were supported to obtain stop-smoking advice.

A sticker (see below) was introduced as an aide-memoire into the inside back cover of each set of outpatient

notes to be completed by the relevant staff member at booking.

If the patient is a smoker, a brief intervention is provided by the staff member at booking and the patient is offered referral to the stop-smoking service.

The sticker provides a prompt not only for supporting patients to quit smoking but also to ensure that smoking status is recorded in the notes.

Outcomes

In the 9 months following introduction of the sticker system:

- referrals to the stop-smoking service quadrupled from 206 to 834 when compared with the same 9 months in the previous year;
- there was a statistically significant increase in the number of successful 4-week quitters.

Smoking Status	Smoker	<input type="checkbox"/>
	Ex-smoker	<input type="checkbox"/>
	Non-smoker	<input type="checkbox"/>
Advice given	Yes	<input type="checkbox"/>
	No	<input type="checkbox"/>
Electronic Referral Requested	Yes	<input type="checkbox"/>
	No	<input type="checkbox"/>
Date:		
Staff name:		

Glossary of Essential Terms

Introduction

Much of the disagreement that occurs during the commissioning or management of services arises because different people use the same term but have a different understanding of its meaning. This Glossary is provided to help develop a shared or common language. If there is a clear, short or memorable definition from the literature, this has been cited and presented in italics; where definitions in the literature do not meet any of these criteria, Right Care has composed and provided a definition.

Access to healthcare

Facilitating access is concerned with helping people to command appropriate health care resources in order to preserve or improve their health. There are at least four aspects.

1. *If services are available, in terms of adequate supply of services, then a population may 'have access' to health care.*
2. *The extent to which a population 'gains access' to health care also depends on financial, organisational and social or cultural barriers that limit utilisation. Thus utilisation is dependent on the affordability, physical accessibility and acceptability of services and not merely the adequacy of supply.*
3. *The services available must be relevant and effective if the population is to 'gain access to satisfactory health outcomes'.*
4. *The availability of services, and barriers to utilisation, have to be evaluated in the context of differing perspectives, health needs and the material and cultural settings of diverse groups in society.*

Source: Gulliford M et al (2001) *Access to Health Care. Report of a Scoping Exercise for the National Co-ordinating Centre for NHS Service Delivery and Organisation R&D (NCCSDO)*. http://www.kcl-phs.org.uk/martin/reprints/accessscopingexercise_report.pdf

Appropriate

A procedure is termed appropriate if its benefits sufficiently outweigh its risks to make it worth performing ...

Source: Kahan JP et al (1994) Measuring the necessity of medical procedures. *Medical Care* 32: 352-365.

Audit

While inspection has traditionally focused on organizational systems and processes, rather than the assessment of internal control systems, audit has usually been the mechanism for examining internal controls (...). However, audit is more associated with stewardship of resources, whereas inspection traditionally is primarily concerned with 'professional and service standards' (...).

Source: Scrivens E (2005) *Quality, Risk and Control in Health Care*. Open University Press (page 128).

Average, see Mean

Burden of disease

The burden of disease is a measurement of the gap between a population's current health and the optimal state where all people attain full life expectancy without suffering major ill-health.

Source: World Health Organization. Health Promotion Glossary Update. [Modified definition (WHO, 2000).] http://www.who.int/healthpromotion/about/HPR%20Glossary_New%20Terms.pdf

Care bundle

A [care] bundle is a structured way of improving the processes of care and care outcomes: a small, straightforward set of evidence-based practices – generally three to five – that, when performed collectively and reliably, have been proven to improve patient outcomes. ... A bundle has specific elements that make it unique.

- *The changes are all necessary and all sufficient, ...*
- *The changes are all based on randomized controlled trials, ... Level 1 evidence. ...*

- *The changes in a bundle are clear-cut and straightforward; they involve all-or-nothing measurement. Successfully completing each step is a simple and straightforward process.*
- *Bundle changes also occur in the same time and space continuum: at a specific time in a specific place, ... during morning rounds every day or every six hours at the patient's bedside, for instance."*

Source: Institute of Health Improvement.

<http://www.ihl.org/knowledge/Pages/ImprovementStories/WhatsaBundle.aspx>

Care pathway

... the expected course of events in the care of a patient with a particular condition, within a set timescale.

Source: Kitchiner D, Davidson D, Bundred P (1996) Integrated Care Pathways: effective tools for continuous evaluation of clinical practice. *J Eval Clin Pract* 2; 65-69.

Clinical guidelines

Systematically developed statements to assist practitioner and patient decisions about appropriate healthcare for specific circumstances.

Source: Cited in Thompson C, Dowding D (2002) *Clinical Decision Making and Judgement in Nursing* Elsevier Limited (page 148).

Commissioner

... to be the advocate for patients and communities, securing a range of appropriate high-quality health care services for people in need [and] to be the custodian of tax-payers' money; this brings a requirement to secure best value in the use of resources.

Source: House of Commons Health Committee (2010) Commissioning. Fourth Report of Session 2009-10. Volume 1. <http://www.publications.parliament.uk/pa/cm200910/cmselect/cmhealth/268/268i.pdf>

Commissioning

Commissioning in the NHS is the process of ensuring that the health and care services provided effectively meet the needs of the population. It is a complex process with responsibilities ranging from assessing population needs, prioritising health outcomes, procuring products and services, and managing service providers.

Source: Department of Health (2010) Commissioning [Archived content]. <http://webarchive.nationalarchives.gov.uk/+/www.dh.gov.uk/en/managingyourorganisation/commissioning/index.htm>

Confidence intervals

Confidence intervals give the range within which the true size of a treatment effect (which is never precisely known) lies, with a given degree of certainty (usually 95% or 99%).

Source: Evans I, Thornton H, Chalmers I (2006) *Testing Treatments. Better Research for Better Healthcare*. The British Library.

Costs

Cost is not solely financial. Cost may be measured as the time used, the carbon produced, or the benefit that would be obtained if the resources were used for another group of patients (i.e. the opportunity cost).

Culture

Culture is the shared tacit assumptions of a group that it has learned in coping with external tasks and dealing with internal relationships.

Source: Schein EH (1999) *The Corporate Culture Survival Guide*. John Wiley & Sons (page 186).

Deprivation

Deprivation is a concept that overlaps, but is not synonymous with poverty. Absolute poverty can be defined as the absence of the minimum resources for physical survival, whereas relative poverty relates to the standards of living in a particular society at a specific time. The different concepts of deprivation include the following:

- *Material deprivation, which reflects the access people have to material goods and resources. Access to these goods and resources enables people "to play the roles, participate in relationships and follow the customary behaviour which is expected of them by virtue of their membership in society" (as described by Townsend).*
- *Social deprivation has been separately distinguished as relating to people's roles and relationships, membership and social contacts in society.*
- *Multiple deprivation relates to the occurrence of several forms of deprivation concurrently, such as low income, poor housing, and unemployment. This can be particularly stressful for families.*

Source: http://www.show.scot.nhs.uk/publications/isd/deprivation_and_health/background.HTM

Effective care

The extent to which an intervention, procedure regimen, or service produces a beneficial outcome under ideal circumstances (e.g., in a randomized controlled trial).

Source: Canadian Agency for Drugs and Technologies in Health (2009) *Optimal Therapy Report: Cost effectiveness of*

blood glucose test strips in the management of adult patients with diabetes mellitus. Volume 3, Issue 3.

Efficiency

See also **Productivity**

... efficiency can be defined as maximising well-being at the least cost to society.

Source: Mitton C, Donaldson C (2004) *Priority setting toolkit. A guide to the use of economics in healthcare decision making.* BMJ Publishing Group.

Equity

Equity is a subjective judgment of fairness.

Evidence

Evidence is generally considered to be information from clinical experience that has met some established test of validity, and the appropriate standard is determined according to the requirements of the intervention and clinical circumstance. Processes that involve the development and use of evidence should be accessible and transparent to all stakeholders.

Source: Olsen LA, Goolsby WA, McGinnis JM; Roundtable on Evidence-Based Medicine (2009) *Leadership Commitments to Improve Value in Health Care: Finding Common Ground: Workshop Summary.* National Academies Press. Free to download at: http://www.nap.edu/catalog.php?record_id=11982

Health

Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.

Source: Preamble to the Constitution of the World Health Organization as adopted by the International Health Conference, New York, 19 June–22 July 1946; signed on 22 July 1946 by the representatives of 61 States (Official Records of the World Health Organization, no. 2, p. 100) and entered into force on 7 April 1948. The definition has not been amended since 1948. <http://www.who.int/suggestions/faq/en/index.html>

Health needs

... objectively determined deficiencies in health that require health care, from promotion to palliation.

Source: World Health Organization (WHO). Health Systems Strengthening Glossary. http://www.who.int/healthsystems/hss_glossary/en/index.html

Healthy life-expectancy

See also **Life-expectancy** and **Life-expectancy at birth**

Average number of years that a person can expect to live in "full health" by taking into account years lived in less than full health due to disease and/or injury.

Source: World Health Organization (WHO) Health statistics and health information systems. Health Status Statistics: Mortality.

<http://www.who.int/healthinfo/statistics/indhale/en/>

Inequalities in health

Inequalities in health are objectively measured differences in health status, healthcare access and health outcomes.

Input, Output and Outcome

Input is a term used by economists to define the resources used, such as the number of hospital beds, to produce the output, such as the number of patients admitted per bed per year.

The economists' terminology is different from the language utilised in quality assurance, in which the terms structure, process and outcome are used. Input equates to structure and process, i.e. the number of beds and the number of admissions per bed, respectively. However, the outcome is distinct from the output. Outcome includes some measure of the effect the process has had on the patients, for example, the number of patients who were discharged to their own home.

Integrated care

Clinical integration, where care by professionals and providers to patients is integrated into a single or coherent process within and/or across professions such as through use of shared guidelines and protocols.

Source: Kodner DL, Spreeuwenberg C (2002) Integrated care: meaning, logic, applications and implications – a discussion paper. *International Journal of Integrated Care* 2: 1-6.

Life-expectancy

See also **Healthy life-expectancy** and **Life-expectancy at birth**

Life-expectancy at a specific age is the average number of additional years a person of that age could expect to live if current mortality levels observed for ages above that age were to continue for the rest of that person's life.

Source: Population Division, DESA, United Nations. *World Population Ageing 1950–2050*, Annex 1.

<http://www.un.org/esa/population/publications/worldageing19502050/pdf/95annexi.pdf>

Life-expectancy at birth

See also **Healthy life-expectancy** and **Life-expectancy**

... , life-expectancy at birth is the average number of years a newborn would live if current age-specific mortality rates were to continue.

Source: Population Division, DESA, United Nations. *World Population Ageing 1950–2050*, Annex 1. <http://www.un.org/esa/population/publications/worldageing19502050/pdf/95annexi.pdf>

Mean (average)

The mean is the sum of values, e.g. size of populations, divided by the number of values, e.g. number of populations in the sample.

Medical care epidemiology

... studies the use of health care services among populations living within the geographic boundaries of “natural” health care [populations].

Source: Wennberg JE (2010) *Tracking Medicine. A Researcher’s Quest to Understand Health Care*. Oxford University Press.

Network

If a system is a set of activities with a common set of objectives, the network is the set of organisations and individuals that deliver the systems.

Outcome, see **Input**

Output, see **Input**

Patient decision aid

Patient decision aids are ... intended to supplement rather than replace patient–practitioner interaction. They may be leaflets, interactive media, or video or audio types. Patients may use them to prepare for talking with a clinician, or a clinician may provide them at the time of the visit to facilitate decision making. At a minimum, patient decision aids provide information about the options and their associated relevant outcomes.

Source: Elwyn G (2006) Developing a quality criteria framework for patient decision aids; online international Delphi Consensus process. *British Medical Journal*, 333: 417-427.

Population medicine

Population medicine is a style of clinical practice in which the clinician is focused not only on the individual patients referred but also on the whole population in need.

Preference-sensitive treatment decisions

Preference sensitive treatment decisions involve making value trade-offs between benefits and harms that should depend on informed patient choice.

Source: O’Connor AM et al (2007) Toward the ‘Tipping Point’: Decision aids and informed patient choice. *Health Affairs* 26: 716-725.

Preference-sensitive care

... elective, or “preference-sensitive” care, interventions for which there is more than one option and where the outcomes will differ according to the option used because patients delegate decision making to doctors, physician opinion rather than patient preference often determines which treatment patients receive. I argue that this can result in a serious but commonly overlooked medical error: operating on the wrong patients – on those who, were they fully informed, would not have wanted the operation they received.

Source: Wennberg JE (2010) *Tracking Medicine. A Researcher’s Quest to Understand Health Care*. Oxford University Press.

Productivity

See also **Efficiency**

Productivity is the relationship between inputs and outputs, such as the number of operations per theatre per year; efficiency is the relationship between outcomes and inputs, such as the number of successful operations per theatre per year.

Protocol

An agreed framework outlining the care that will be provided to patients in a designated area of practice. They do not describe how a procedure is performed, but why, where, when and by whom the care is given.

Source: Working in Partnership Programme, NHS (2006) Using protocols, standards, policies and guidelines to enhance confidence and career development. http://www.rcn.org.uk/__data/assets/pdf_file/0004/176368/Tool5.8-UsingProtocols.pdf

Quality

Quality is the degree to which a service meets pre-set standards of goodness.

Source: Donabedian A, personal communication.

Quality of life

... individuals’ perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns. It is a broad ranging concept

affected in a complex way by the person's physical health, psychological state, level of independence, social relationships, personal beliefs and their relationship to salient features of their environment.

Source: World Health Organization (WHO) Programme on Mental Health. WHOQOL: Measuring Quality of Life. The World Health Organization Quality of Life Instruments (The WHOQOL-100 and the WHOQOL-BREF). http://www.who.int/mental_health/media/68.pdf

Range

The range is the difference between the highest and lowest value in the sample. The range provides a crude measure of the spread of the data.

Safety

Patient safety can, at its simplest, be defined as: The avoidance, prevention and amelioration of adverse outcomes or injuries stemming from the process of healthcare. ... the reduction of harm should be the primary aim of patient safety, not the elimination of error.

Source: Vincent C (2006) *Patient Safety*. Churchill Livingstone.

Self-management

... self-management is especially important for those with chronic disease, where only the patient can be responsible for his or her day-to-day care over the length of the illness. For most of these people self-management is a lifetime task.

Source: Lorig KR, Holman HR (2003) Self-Management Education: History, Definition, Outcomes, and Mechanisms. *Annals of Behavioural Medicine* 26; 1-7. doi 10.1207/S153124796ABM2601_01

Shared decision-making

In a shared decision, a health care provider communicates to the patient personalized information about the options, outcomes, probabilities, and scientific uncertainties of available treatment options, and the patient communicates his or her values and the relative importance he or she places on benefits and harms.

Source: Wennberg JE (2010) *Tracking Medicine. A Researcher's Quest to Understand Health Care*. Oxford University Press.

Standard deviation

See also **Variance**

The standard deviation is a measure of spread, and is the square root of the variance.

Standards

A minimum level of acceptable performance or results or excellent levels of performance or the range of acceptable performance or results.

Source: Kohn LT, Corrigan JM, Donaldson MS (eds) Committee on Quality of Health Care in America, Institute of Medicine (2000) *To Err is Human. Building a Safer Health System*. National Academy Press, Washington.

Structure

Structure comprises the inter-relation of healthcare facilities through which health services are provided. Healthcare is a localised activity, provided by the organisations that form the general healthcare structure, including hospitals, GP practices, clinics, ambulatory care, rehabilitation centres, home care and long-term-nursing care.

Supply-sensitive care

It differs in fundamental ways from both effective care and preference-sensitive care. Supply-sensitive care is not about a specific treatment per se; rather, it is about the frequency with which everyday medical care is used in treating patients with acute and chronic illnesses. Remedying variation in supply-sensitive care requires coming to terms with the "more care is better" assumption. Are physician services and hospitals in high-cost, high-use regions overused?

Source: Wennberg JE (2010) *Tracking Medicine. A Researcher's Quest to Understand Health Care*. Oxford University Press.

System

A system is a set of activities with a common set of objectives for which an annual report is produced.

Unwarranted variation

Variation in the utilization of health care services that cannot be explained by variation in patient illness or patient preferences.

Source: Wennberg JE (2010) *Tracking Medicine. A Researcher's Quest to Understand Health Care*. Oxford University Press.

Value

... value is expressed as what we gain relative to what we give up – the benefit relative to the cost.

Source: Institute of Medicine of the National Academies (2008) *Learning Healthcare System Concepts v. 2008. The Roundtable on Evidence-Based Medicine*, Institute of Medicine. Annual Report.

Variation

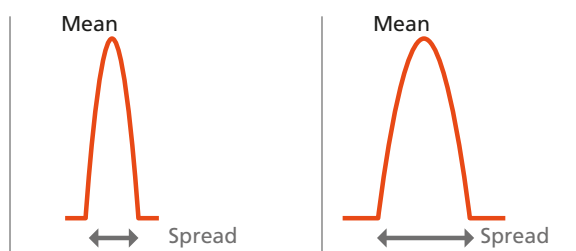
Everything we observe or measure varies. Some variation in healthcare is desirable, even essential, since each patient is different and should be cared for uniquely. New and better treatments, and improvements in care processes result in beneficial variation.

Source: Neuhauser D, Provost L, Bergman B (2011) The meaning of variation to healthcare managers, clinical and health-services researchers, and individual patients. *BMJ Qual Saf* 20 (Suppl 1); i36-i40. doi: 10.1136/bmjqs.2010.046334

Variance

See also Range

The variance is another measure of spread, which describes how far the values in the sample lie away from the mean value. It is the average of the squared differences from the mean and is a better measure of spread than the range.



This figure illustrates how two populations may have the same mean value, but different degrees of variation or spread: the second population shows greater variation than the first.

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MAP 7

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MAP 8

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MAPS 9 AND 10

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Robert Winter
Julian Flowers
Kevin Holton
Jonathan Couriel
Bernard Higgins
Duncan Keeley
Vikki Knowles
Martyn Partridge
Kim Price

June Roberts
Mike Thomas
Kevin Watson

MAP 12

Bronwen Thompson
Matt Kearney
Sue Hill
Robert Winter
Julian Flowers
Kevin Holton
Jonathan Couriel
Bernard Higgins
Duncan Keeley
Vikki Knowles
Martyn Partridge
Kim Price
June Roberts
Mike Thomas

MAP 14

Edward Wozniak
Ronny Cheung
Matt Kearney
Helen Duncan
Helen Smith
Kate Thurland

MAP 15

Mark Woodhead
Matt Kearney
Sue Hill
Robert Winter
Julian Flowers
Kevin Holton
Andrew Hughes

MAP 16

Martin Allen
Paul White
Matt Kearney
Sue Hill
Robert Winter
Julian Flowers
Kevin Holton

MAPS 17 AND 18

Malcolm Semple
Ronny Cheung
Matt Kearney
Helen Duncan
Helen Smith
Kate Thurland

MAP 19

Helen Barlow
Sue Faulding
David Lloyd

Vincent Mak
Rosemary Matheson
Mike Morgan
Martyn Partridge
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CASE-STUDY 1

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CASE-STUDY 2

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CASE-STUDY 3

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CASE-STUDY 4

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CASE-STUDY 5

Mark Hopkin
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CASE-STUDY 6

Nawar Diar Bakerly
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CASE-STUDY 7

Nicola Roberts
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CASE-STUDY 8

Anna Murphy
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CASE-STUDY 9

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CASE-STUDY 10

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CASE-STUDY 11

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GLOSSARY OF ESSENTIAL TERMS

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