

PHYSIOLOGICAL SERVICES

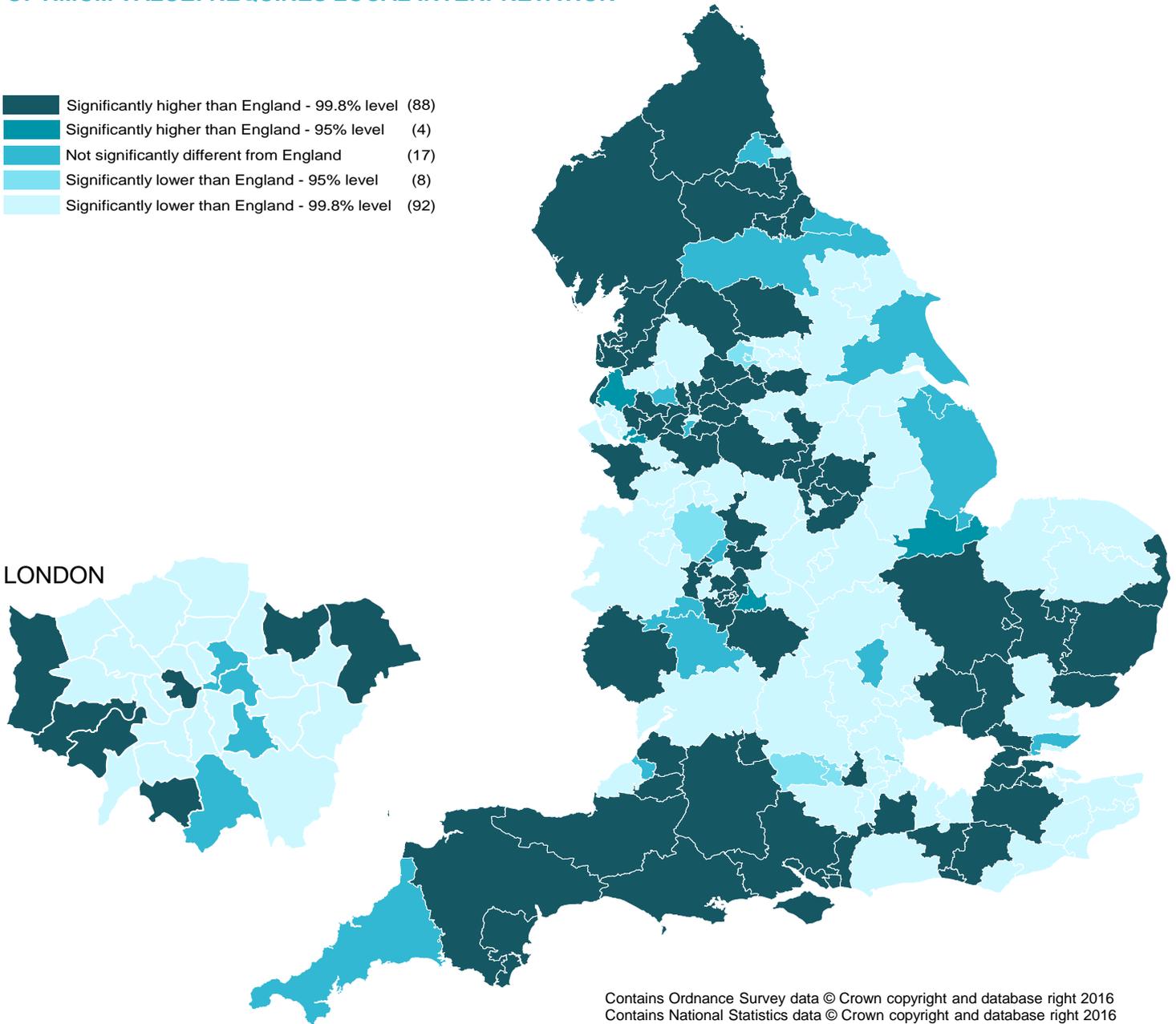
**MAP 24: Rate of audiology assessments undertaken per weighted population by CCG**

Adjusted for age, sex and 'need', January–March 2016

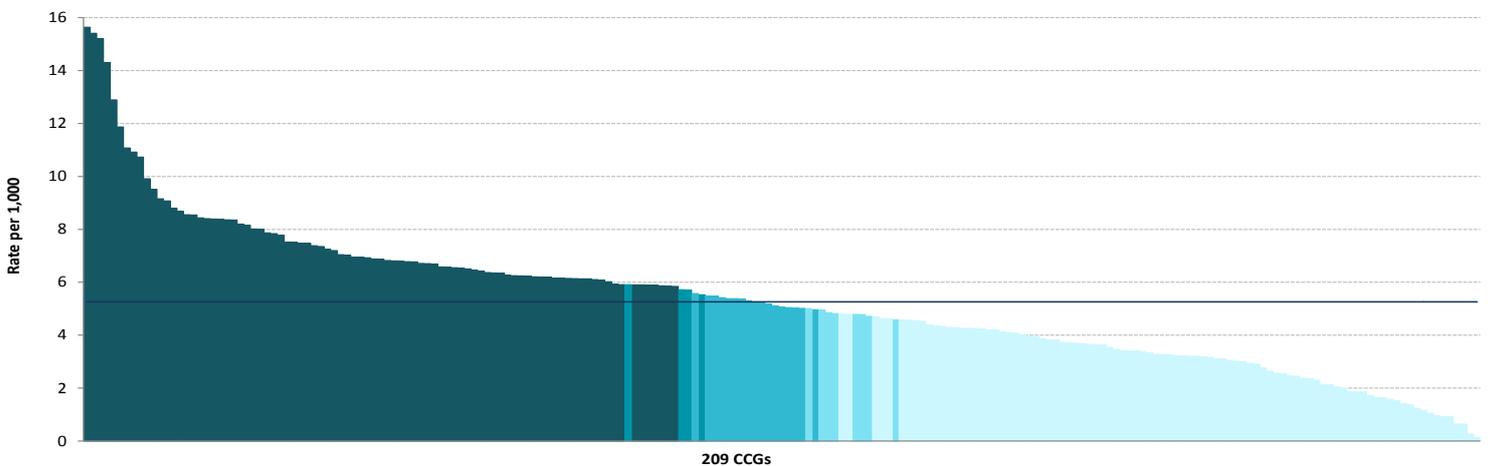
Domain 2: Enhancing quality of life for people with long-term conditions

OPTIMUM VALUE: REQUIRES LOCAL INTERPRETATION

- Significantly higher than England - 99.8% level (88)
- Significantly higher than England - 95% level (4)
- Not significantly different from England (17)
- Significantly lower than England - 95% level (8)
- Significantly lower than England - 99.8% level (92)



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## Context

Over nine million in England are affected by hearing loss. Hearing problems can have an effect on the development of language in children, reduce chances of employment, restrict aspirations and life chances, increase the risk of mental health problems and interfere with peoples’ ability to care for their own and their families’ long-term health conditions.

In the Global Burden of Disease 2013 study it was found that for people of all ages ‘age-related and other hearing loss’ is the sixth most important cause of years lived with disability (YLD) in both England and UK (3.9% in both areas), up from seventh in 2010 (3.8% in both areas), and for people aged over 70 years hearing loss is the most important cause of YLDs in both England and the UK.<sup>1</sup>

Half of the people with a hearing loss can be managed effectively by a care package including hearing aids and other environmental aids to reduce economic, social and personal impacts across the life-course.

Audiology assessments cover a range of investigations of hearing and balance. The assessments determine functional ability, possible pathologies and impact on the individual’s daily activities. Following assessment, an appropriate treatment and support pathway is selected, which can include:

- surgery for cochlear implant

- rehabilitation support including programmed digital signal processing (digital) hearing aids
- counselling
- frequency modulation (FM) systems and assistive listening devices (ALDs)

Referrals for assessment of age-related progressive hearing loss comprise the largest proportion of hearing assessments.

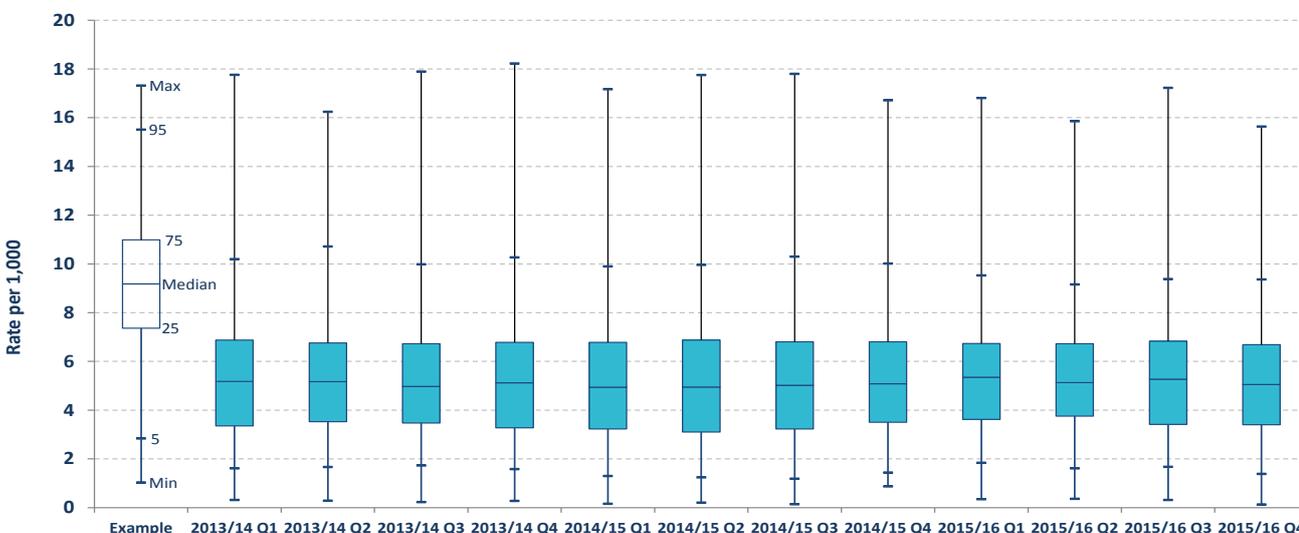
Although 35,000 children and 1.6 million adults with hearing loss are being managed and supported by public sector services, population surveys estimate eight million adults live with unreported and unmanaged loss of whom four million have hearing loss that confers great difficulty in understanding speech, even in a quiet environment.

Over the next 20 years the impact of hearing loss will increase:

- as the population ages
- with increasing exposure to social noise (from MP3 players, club music and mobile phones)

Owing to the population ageing it is estimated that by 2035 over 13 million people in England will have hearing loss.

Map 24: Boxplot of audiology assessments by CCG



	Example	2013/14 Q1	2013/14 Q2	2013/14 Q3	2013/14 Q4	2014/15 Q1	2014/15 Q2	2014/15 Q3	2014/15 Q4	2015/16 Q1	2015/16 Q2	2015/16 Q3	2015/16 Q4	
Max-Min (Range)		17.4	16.0	17.7	17.9	17.0	17.5	17.7	15.8	16.5	15.5	16.9	15.5	No significant change
95th-5th percentile		8.6	9.1	8.3	8.7	8.6	8.7	9.1	8.6	7.7	7.5	7.7	8.0	NARROWING Significant
75th-25th percentile		3.5	3.2	3.3	3.5	3.6	3.8	3.6	3.3	3.1	3.0	3.4	3.3	No significant change
Median		5.2	5.2	5.0	5.1	4.9	4.9	5.0	5.1	5.4	5.1	5.3	5.1	No significant change

<sup>1</sup> Institute of Health Metrics and Evaluation (IHME). GBD Compare/Viz Hub. <http://ihmeuw.org/3uod>

## Magnitude of variation

The map and column chart display the latest period (January-March 2016), during which CCG values ranged from 0.1 per 1,000 weighted population to 15.6 per 1,000 weighted population, which is a 123.3-fold difference between CCGs. The England value for this quarter was 5.3 per 1,000 weighted population.

The boxplot shows the distribution of CCG values for the period 2013/14 to 2015/16 by quarter.

The 95th to 5th percentile gap narrowed significantly. There was no significant change in the maximum to minimum range nor in the 75th to 25th percentile gap.

There was no significant change in the median.

The degree of variation should be highly related to population demography, but internal analysis conducted by NHS England showed that the degree of variation in intervention rates for people over 65 years in 2011/12 were similar to those in the general population. In 2015/16 data for England, which has been standardised for age, the annualised rate was 21.5 per 1,000 population and half of CCGs had an annualised rate of provision of less than 20 per 1,000 population, rates that cannot be explained by local demography or estimates of prevalence and incidence<sup>2</sup>.

## Options for action

Commissioners need to raise awareness of hearing loss, its implications in primary care and the cost-effectiveness of providing good-quality hearing-aid services.

Commissioners together with service providers need to review service capacity and assess long-term plans for capacity development:

- to address any gap between met and unmet need
- to meet increasing need due to factors such as an ageing population and the potential for increasing exposure to social noise

Building capacity will ensure that hearing loss in local populations is appropriately diagnosed and treated in a timely manner to minimise its broader social and physical impact. To do this commissioners and service providers need to understand:

- the current rate of audiology assessments in relation to local demography in order to estimate the gap between current provision and unmet need
- the current annual increase in audiology assessments locally and the expected rate of increase

Commissioners need to specify that service providers:

- establish triage and referral arrangements to support earlier management of hearing loss
- improve service quality, for example, by accreditation through the Improving Quality in Physiological Services programme (IQIPS; see 'Resources')

NHS England has published a framework to support the commissioning of adult hearing loss services.

## RESOURCES

- NHS England and Department of Health. Action Plan on Hearing Loss. 23 March 2015. <https://www.england.nhs.uk/wp-content/uploads/2015/03/act-plan-hearing-loss-upd.pdf>
- NHS England, Office of the Chief Scientific Officer. Commissioning Services for People with Hearing Loss: A framework for clinical commissioning groups. 18 July 2016. <https://www.england.nhs.uk/wp-content/uploads/2016/07/HLCF.pdf>
- Action on Hearing Loss. Hearing Matters webpage. Scroll down to heading 'Data' for 2014 estimated prevalence of hearing loss and for 2019 projected prevalence of hearing loss for each CCG and local authority in England. <https://www.actiononhearingloss.org.uk/supporting-you/policy-research-and-influencing/research/hearing-matters.aspx>
- Shaping the Future: Strengthening the Evidence to Transform Audiology Services. NHS Improvement, 2010. On the following website scroll down to find weblink to paper deposited as 'DEP2012-0235'. [http://www.parliament.uk/business/publications/business-papers/commons/deposited-papers/?fd=2012-01-01&td=2015-07-01&house=1&search\\_term=Department+of+Health&it emId=119014&page=14&max=50#toggle-235](http://www.parliament.uk/business/publications/business-papers/commons/deposited-papers/?fd=2012-01-01&td=2015-07-01&house=1&search_term=Department+of+Health&it emId=119014&page=14&max=50#toggle-235)
- Pushing the Boundaries: Evidence to support the delivery of good practice in audiology. NHS Improvement 2010. <https://kinwahlin.wordpress.com/2010/08/12/pushing-the-boundaries-evidence-to-support-the-development-and-implementation-of-good-practice-in-audiology-nhs-improvement-july-2010/>
- NHS Improvement. The best of clinical pathway redesign. Practical examples of delivering benefits to patients. See pages 14 and 39-43 for information on Audiology including two case-studies. [www.nhs.uk/download.ashx?mid=8223&nid=8222](http://www.nhs.uk/download.ashx?mid=8223&nid=8222)
- Improving Quality in Physiological Services (IQIPS). <https://www.iqips.org.uk/>

<sup>2</sup> NHS England, Office of the Chief Scientific Officer. Commissioning Services for People with Hearing Loss: A framework for clinical commissioning groups. 18 July 2016. <https://www.england.nhs.uk/wp-content/uploads/2016/07/HLCF.pdf>

PHYSIOLOGICAL SERVICES

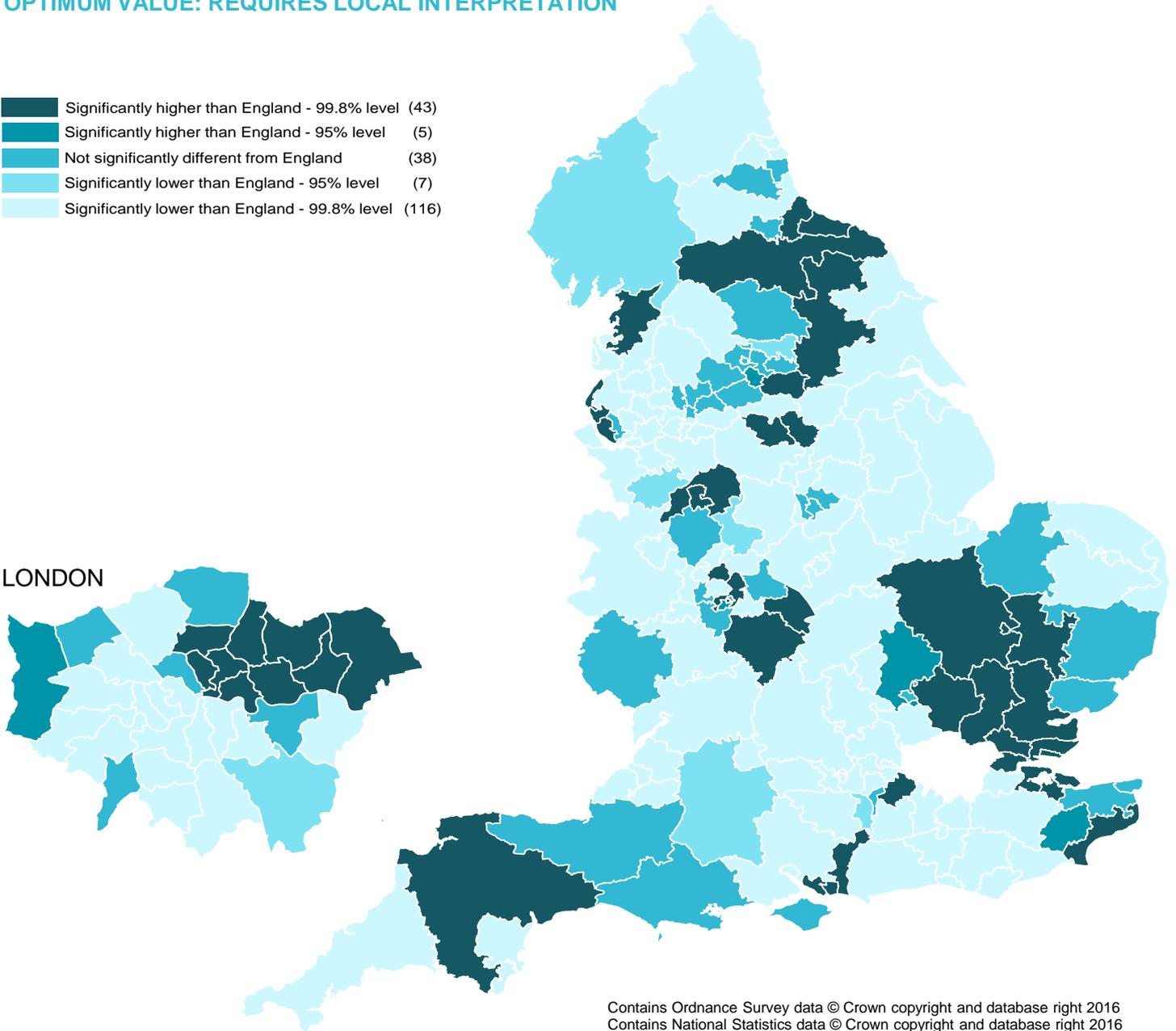
**MAP 25: Rate of diagnostic sleep studies undertaken per weighted population by CCG**

Adjusted for age, sex and 'need', January–March 2016

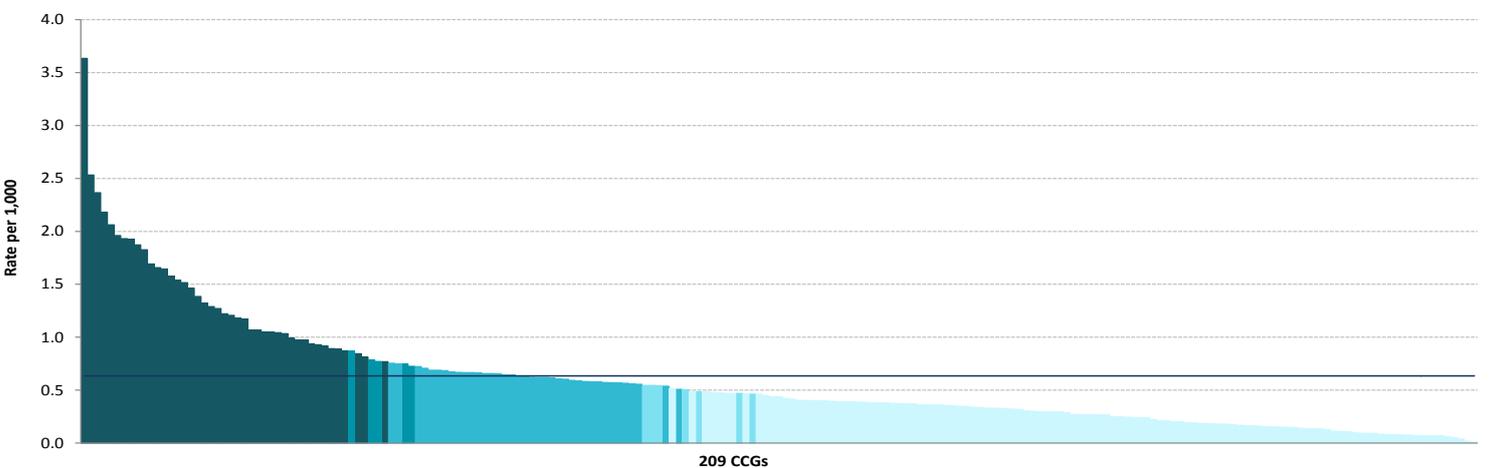
Domain 2: Enhancing quality of life for people with long-term conditions

OPTIMUM VALUE: REQUIRES LOCAL INTERPRETATION

- Significantly higher than England - 99.8% level (43)
- Significantly higher than England - 95% level (5)
- Not significantly different from England (38)
- Significantly lower than England - 95% level (7)
- Significantly lower than England - 99.8% level (116)



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## Context

Sleep studies are conducted to identify abnormal sleep patterns and pathologies, and to assess and provide therapeutic intervention. There are more than 80 recognised sleep disorders, which may affect the timing, quality and quantity of sleep. Sleep disorders can vary from mild to life-threatening. Common sleep disorders are insomnia, sleep apnoea, restless leg syndrome, narcolepsy, and sleep problems associated with Parkinson’s disease, autism and many other conditions.

Obstructive sleep apnoea (OSA) is the most common sleep disorder, affecting about 4% of the population. During sleep, muscles in the upper airway relax to a greater degree than normal or parts of the airway become blocked for one of several reasons, resulting in apnoeas or pauses in breathing lasting from 10 seconds to two minutes. Apnoeas can cause sleep disruption and poor-quality sleep, leading to daytime sleepiness with an increased risk of serious road traffic incidents. If left untreated, OSA can be a risk factor for stroke, cardiovascular problems or diabetes.

Obstructive sleep apnoea is more common in men than in women, and becomes increasingly more common in men with age. About 40% of people who are obese and 77% of people who are morbidly obese have OSA.<sup>1</sup>

There are two referral routes for sleep studies:

- respiratory
- neurological – in clinical neurophysiology departments, there is a higher mean cost but lower activity when compared with studies undertaken via the respiratory referral route

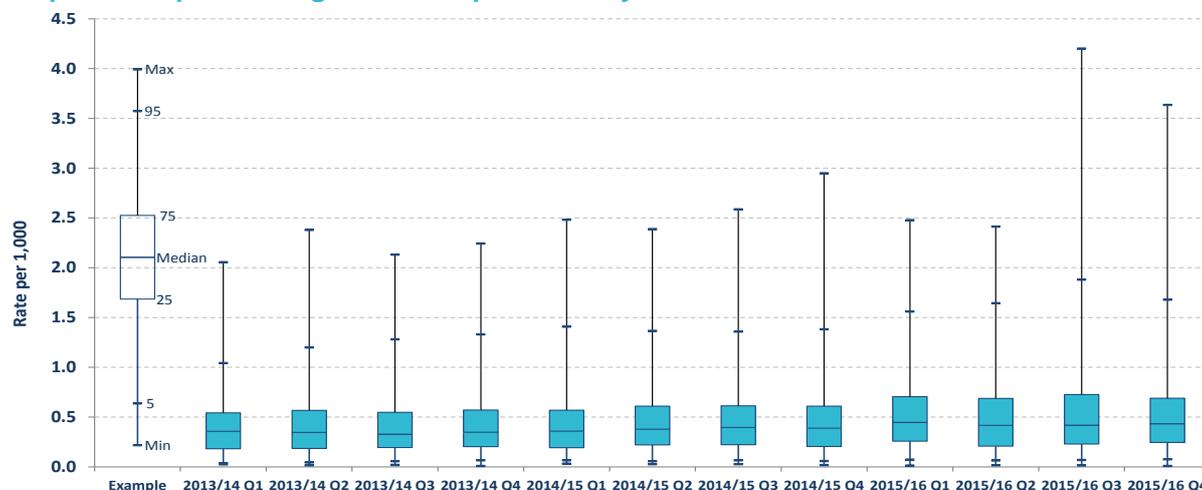
There was an increase of 69.5% in the commissioning of sleep studies from January 2007 to March 2013<sup>2</sup>. Reasons for this increase may be:

- the clearance of backlogs in accordance with the interim diagnostic waiting time targets and the maximum waiting time constitutional right
- other factors such as awareness-raising initiatives that may increase the demand for sleep studies and result in additional referrals

In addition there may be a demand for certain groups of patients, such as professional/commercial drivers with OSA, to be fast-tracked through the referral and management process in order to regain their driving licence and thereby retain their job and source of income.

As the real prevalence of symptomatic OSA is 4% in middle-aged men and up to 2% in middle-aged women,<sup>3</sup> current rates of provision of sleep studies may be too low. When the rates of polysomnography (PSG) sleep tests were compared in five countries, the UK’s rate of provision was significantly lower than that in other countries.<sup>4</sup> In future, therefore, the number of sleep studies undertaken in England is likely to continue to increase.

Map 25: Boxplot of diagnostic sleep studies by CCG



	Example	2013/14 Q1	2013/14 Q2	2013/14 Q3	2013/14 Q4	2014/15 Q1	2014/15 Q2	2014/15 Q3	2014/15 Q4	2015/16 Q1	2015/16 Q2	2015/16 Q3	2015/16 Q4	
Max-Min (Range)		2.0	2.4	2.1	2.2	2.4	2.4	2.6	2.9	2.5	2.4	4.2	3.6	WIDENING Significant
95th-5th percentile		1.0	1.2	1.2	1.3	1.3	1.3	1.3	1.3	1.5	1.6	1.8	1.6	WIDENING Significant
75th-25th percentile		0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.4	WIDENING Significant
Median		0.4	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	INCREASING Significant

<sup>1</sup> O’Keefe T, Paterson E. Evidence supporting routine polysomnography before bariatric surgery. *Obes Surg* 2004; 14: 23-26.

<sup>2</sup> Public Health England and RightCare. The NHS Atlas of Variation in Healthcare September 2015: page 81 and Figure 19.1 on page 258.

<sup>3</sup> NHS Choices. Obstructive sleep apnoea. <http://www.nhs.uk/conditions/Sleep-apnoea/Pages/Introduction.aspx>

<sup>4</sup> Flemons WW, Douglas NJ, Kuna ST et al. Access to Diagnosis and Treatment of Patients with Suspected Sleep Apnea. *American Journal of Respiratory and Critical Care Medicine* 2004; 169: 668-672. doi: 10.1164/rccm.200308-1124PP.

<http://www.atsjournals.org/doi/pdf/10.1164/rccm.200308-1124PP>

## Magnitude of variation

The map and column chart display the latest period (January-March 2016), during which CCG values ranged from 0.0 per 1,000 weighted population to 3.6 per 1,000 weighted population. The England value for this quarter was 0.6 per 1,000 weighted population.

The boxplot shows the distribution of CCG values for the period 2013/14 to 2015/16 by quarter. Throughout this period the distribution of values has been strongly positively skewed.

There has been significant widening of all three measures of variation. This is due to an upward stretching of the distribution with much greater increases in the maximum, 95th percentile and 75th percentile, than in the minimum, 5th percentile and 25th percentile.

The median increased very slightly from 0.36 per 1,000 weighted population to 0.43 per 1,000 weighted population, however the gradient of increase is statistically significant owing to the steady nature of the rise.

Reasons for the degree of variation observed are differences in:

- availability of the service
- prevalence of risk factors and related conditions, such as obesity
- symptom recognition and appropriate referral in primary care
- patient access including travelling distance

In localities with large sleep centres, which take many tertiary referrals, the rates of testing for sleep-related conditions tend to be higher.

Steier et al produced an overall risk map for OSA that could be used to predict relative prevalence estimates in the UK.<sup>5</sup> They found not only significant regional variation in predicted prevalence estimates, but also a significant mismatch between areas identified as having a high predicted prevalence estimate and the distribution of existing sleep centres.

## Options for action

Commissioners together with service providers need:

- to review referral and delivery models for sleep services
- to agree clear pathways for referral, and to consider including GP screening tools

- to refine understanding of expected and observed prevalence of related conditions;
- to review funding models (for example, outcomes versus activity-based payments) to ensure the financial incentives drive improvement and increase value
- to assess the demand and available capacity for local sleep services
- to review models for initial diagnostic testing and triage approaches to referral management

Commissioners need to encourage service providers to participate in the national accreditation scheme, Improving Quality in Physiological Services (IQIPS; see 'Resources') to assess quality and productivity. Clinicians, especially those working in localities with a high prevalence of sleep disorders, can work to raise awareness of the need for sleep studies in the local population.

## RESOURCES

- Transforming Respiratory And Sleep Diagnostic Services To Deliver 18 Weeks - A Good Practice Guide. Department of Health, February 2009. <https://kinwahlin.wordpress.com/2009/04/08/transforming-respiratory-and-sleep-diagnostic-services-to-deliver-18-weeks-a-good-practice-guide-uk/>
- NICE. Clinical Knowledge Summaries. Obstructive sleep apnoea syndrome. Last revised in April 2015. <http://cks.nice.org.uk/obstructive-sleep-apnoea-syndrome>
- British Lung Foundation. Obstructive sleep apnoea (OSA): Toolkit for commissioning and planning local NHS services in the UK. 2015. [https://www.blf.org.uk/sites/default/files/OSA\\_Toolkit\\_2015\\_BLF\\_0.pdf](https://www.blf.org.uk/sites/default/files/OSA_Toolkit_2015_BLF_0.pdf)
- Improving Quality in Physiological Services (IQIPS). <https://www.iqips.org.uk/>

<sup>5</sup> Steier J, Martin A, Harris J et al. Predicted relative prevalence estimates for obstructive sleep apnoea and the associated healthcare provision across the UK. *Thorax* doi:10.1136/thoraxjnl-2013-203887 <http://thorax.bmj.com/content/early/2013/08/26/thoraxjnl-2013-203887.abstract>

**PHYSIOLOGICAL SERVICES**

**MAP 26: Percentage of patients with COPD with a record of FEV1 in the preceding 12 months<sup>1</sup> by CCG**

2014/15

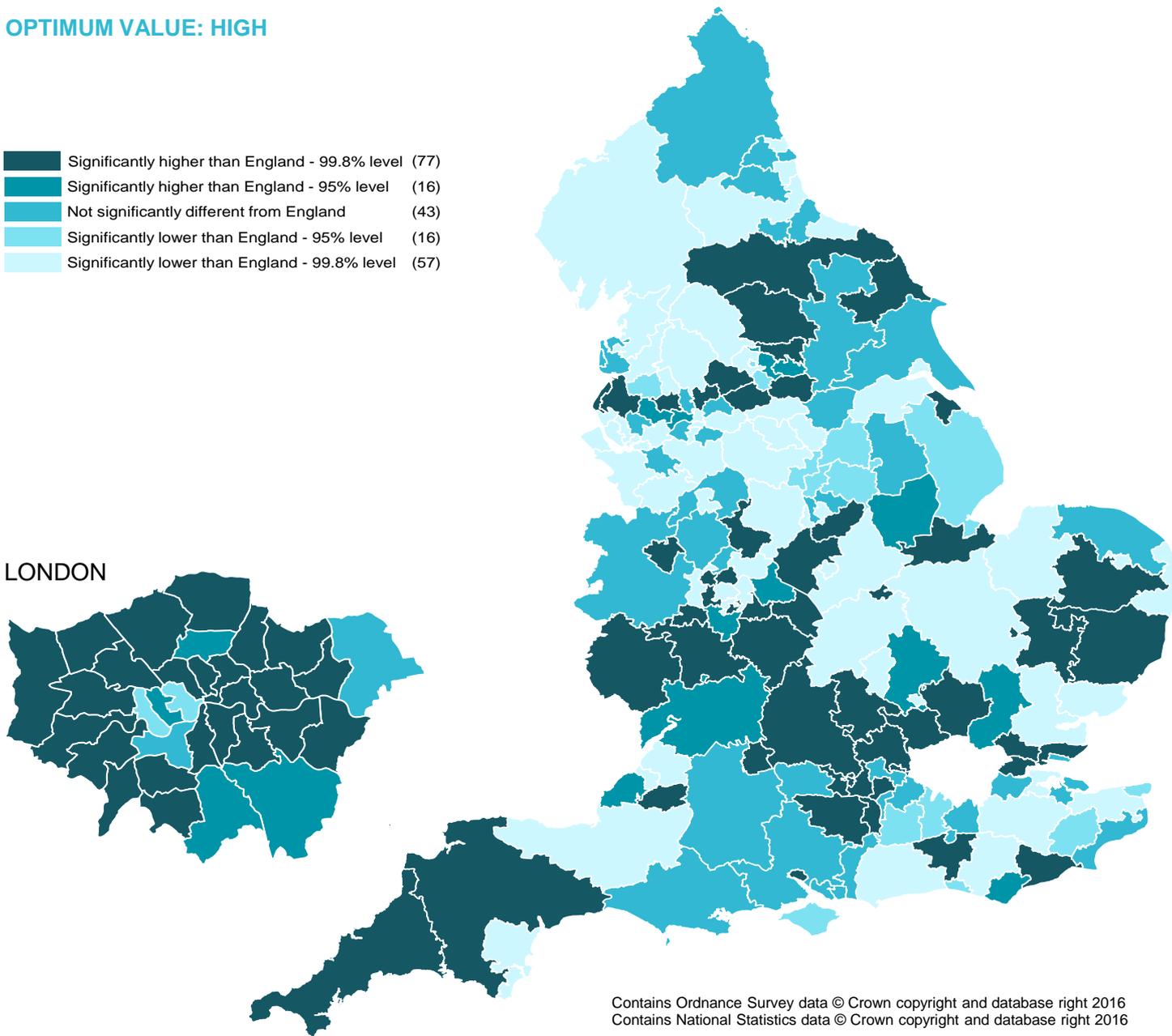
Domain 1: Preventing people from dying prematurely

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

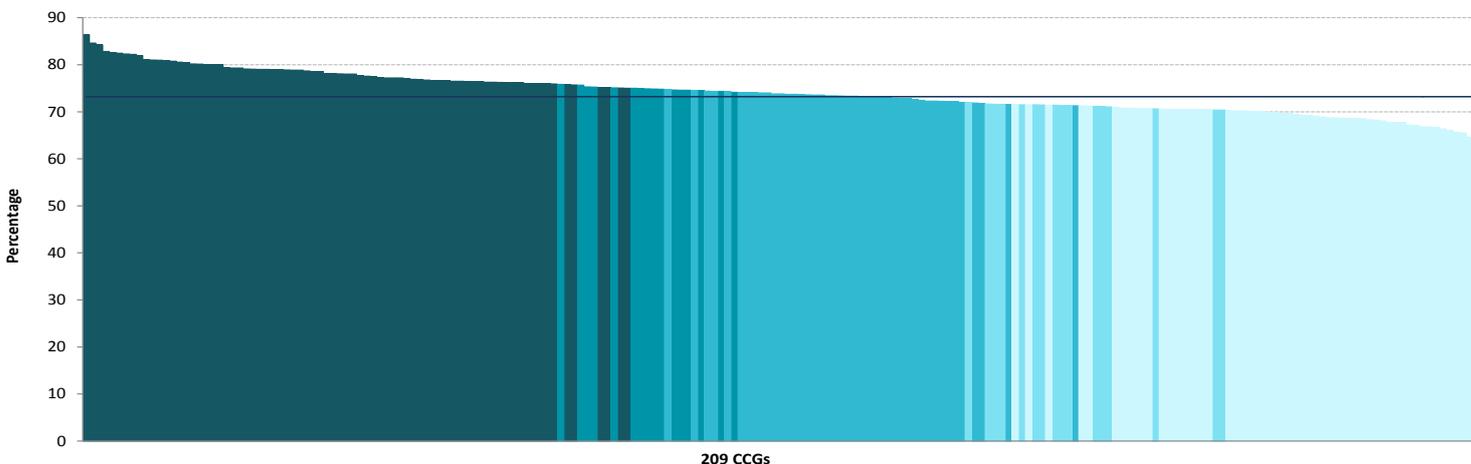
**OPTIMUM VALUE: HIGH**

- Significantly higher than England - 99.8% level (77)
- Significantly higher than England - 95% level (16)
- Not significantly different from England (43)
- Significantly lower than England - 95% level (16)
- Significantly lower than England - 99.8% level (57)

LONDON



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209 CCGs

## Context

NICE recommends spirometry as the objective test to identify abnormalities in lung volumes and air flow.<sup>2</sup> It is the standardised measurement of a forced expiration (FE) into a calibrated measuring device or spirometer. In conjunction with physical assessment, history-taking, blood tests and X-rays, spirometry is used to exclude or confirm particular types of lung disease including COPD.

Most of the management for people with COPD is provided in the primary care sector. The long-term 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.

This indicator – COPD004 in the Quality and Outcomes Framework (QOF) 2014/15<sup>3</sup> – reflects one aspect of the long-term disease management of COPD in primary care.<sup>4</sup> 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, for example, when patients do not attend for review despite repeated invitations or if a medication cannot

be prescribed due to a contraindication or side-effect. Both the population coverage with exception-reported patients included and the exception-adjusted population coverage are reported annually.

For this indicator, excepted patients have been included in the denominator and therefore it shows actual population coverage.

People not seen for review, however, are at high risk of not receiving appropriate active long-term disease management and, therefore, of experiencing worse outcomes than people who do receive a review.

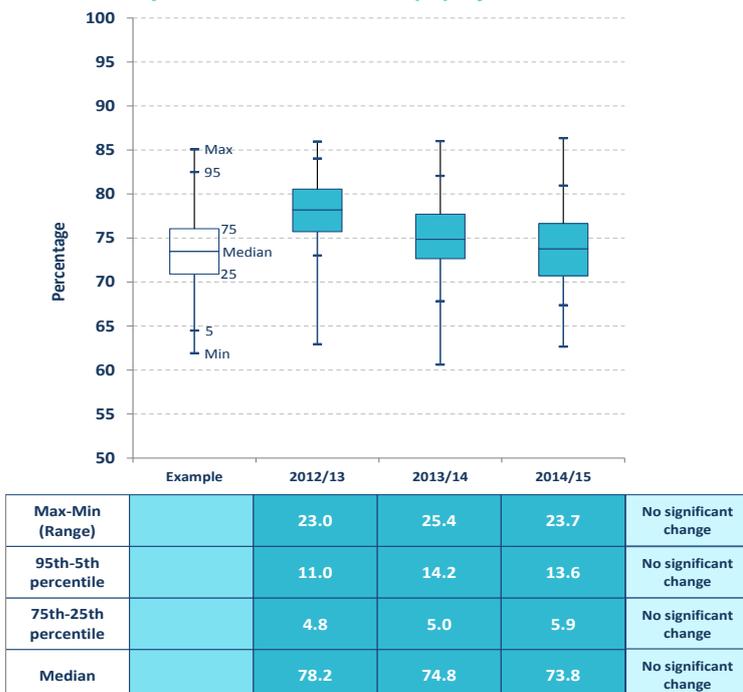
## Magnitude of variation

The map and column chart display the latest period (2014/15), during which CCG values ranged from 62.7% to 86.3%, which is a 1.4-fold difference between CCGs. The England value for 2014/15 was 73.2%.

The boxplot shows the distribution of CCG values for the period 2012/13 to 2014/15. There was no significant change in any of the three variation measures between 2012/13 to 2014/15.

The median decreased from 78.2% in 2012/13 to 73.8% in 2014/15. This decrease is not statistically significant although a reduction of this magnitude is likely to be significant if it were observed over a longer time period.

**Map 26: Boxplot of patients with COPD with FEV1 record in previous 12 months (%) by CCG**



One reason for unwarranted variation is differences in the accuracy of diagnosis of COPD. Spirometry is often performed inaccurately; consequently, around one-quarter of people on GP COPD registers have been incorrectly diagnosed. In the NICE COPD Quality Standard (see 'Resources') it is recommended that diagnostic spirometry should be carried out on calibrated equipment by healthcare professionals competent in its performance and interpretation. Primary care staff, however, are often inadequately trained or use poor-quality equipment. People wrongly included in or excluded from the COPD register on the basis of poor-quality spirometry may be receiving inappropriate and potentially harmful treatment. There is a considerable opportunity cost associated with this level of mis-diagnosis: the Department of Health estimated that up to £29 million is mis-spent on COPD medication for people who may not have COPD.

<sup>1</sup> QOF COPD004 with exception-reported patients included.

<sup>2</sup> NICE. Chronic obstructive pulmonary disease in over 16s: diagnosis and management. NICE guidelines [CG101]. June 2010.

<https://www.nice.org.uk/guidance/CG101>

<sup>3</sup> BMA, NHS England and NHS Employers. 2014/15 General Medical Services (GMS) Contract QOF. Guidance for GMS Contract 2014/15.

March 2014. <http://www.nhsemployers.org/~media/Employers/Documents/Primary%20care%20contracts/QOF/2014-15/14-15%20Medical%20Services%20contract%20-%20Quality%20and%20Outcomes%20Framework.pdf>

<sup>4</sup> This indicator was identical in the 2012/13 QOF. Guidance for PCOs and practices.

[http://www.nhsemployers.org/Aboutus/Publications/Documents/QOF\\_2012-13.pdf](http://www.nhsemployers.org/Aboutus/Publications/Documents/QOF_2012-13.pdf) but in the 2013/14 GMS contract QOF. Guidance for GMS contract 2013/14. <http://www.nhsemployers.org/Aboutus/Publications/Documents/qof-2013-14.pdf> the indicator number has been changed from "COPD10" to "COPD indicator 004" and the time-frame has been changed from 'in the preceding 15 months' to 'in the preceding 12 months'.

## Options for action

Actual population coverage for systematic long-term disease management in people with COPD is lower than the QOF achievement suggests. It is possible that many of the people not attending for regular review or undertaking self-management programmes such as pulmonary rehabilitation are among the high-risk patients in whom control is poor<sup>5</sup>. Novel and creative strategies are necessary to reach people previously not reached in order to optimise their COPD control.

To increase local population coverage of long-term disease management in COPD and thereby influence patient outcomes, commissioners could consider interventions to help more local practices become effective at reaching the entire local population with COPD through regular review by:

- benchmarking and sharing local exception-reporting data
- identifying the systems to maximise patient-reach used in the best-performing practices
- supporting local practices with high exception rates to implement best-practice systems and improve patient outcomes through systematic chronic disease management

To ensure that COPD is diagnosed and treated appropriately within the local population, commissioners need:

- to commission quality-assured spirometry services with an agreed local pathway for referral from primary care, and ensure access to appropriate expertise in local lung function laboratories
- to support local spirometry services to apply for IQIPS accreditation (see 'Resources')
- to ensure that diagnostic spirometry in all local settings is performed only by professionals trained and certified as competent to Association for Respiratory Technology and Physiology (ARTP), or equivalent, standards

In addition clinicians in primary care need to review the diagnosis of people currently on the COPD register to identify individuals who may not have COPD.

## RESOURCES

- Department of Health/Medical Directorate/Respiratory Team. An outcomes strategy for people with chronic obstructive pulmonary disease (COPD) and Asthma in England. July 2011. [http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH\\_127974](http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_127974)

- Department of Health/Medical Directorate/Respiratory Team. An Outcomes Strategy for COPD and Asthma: NHS Companion Document. May 2012.
- [http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH\\_134000](http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_134000)
- NHS Medical Directorate. COPD Commissioning Toolkit. A Resource for Commissioners. 2 August 2012. [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/212876/chronic-obstructive-pulmonary-disease-COPD-commissioning-toolkit.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/212876/chronic-obstructive-pulmonary-disease-COPD-commissioning-toolkit.pdf)
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- Public Health England. INHALE – **I**nteractive **H**ealth **A**tlas for **L**ung conditions in **E**ngland. <http://fingertips.phe.org.uk/profile/inhale>
- The Primary Care Respiratory Society UK. <http://www.pcrs-uk.org/>
- Improving Quality in Physiological Services (IQIPS). <https://www.iqips.org.uk/>

<sup>5</sup> Andrew Keatin, Annemarie Lee and Anne E Holland. 2011. What prevents people with chronic obstructive pulmonary disease from attending pulmonary rehabilitation? A systematic review. *Chronic Respiratory Disease*, 89-99. <http://crd.sagepub.com/content/8/2/89.full.pdf>

**PHYSIOLOGICAL SERVICES**

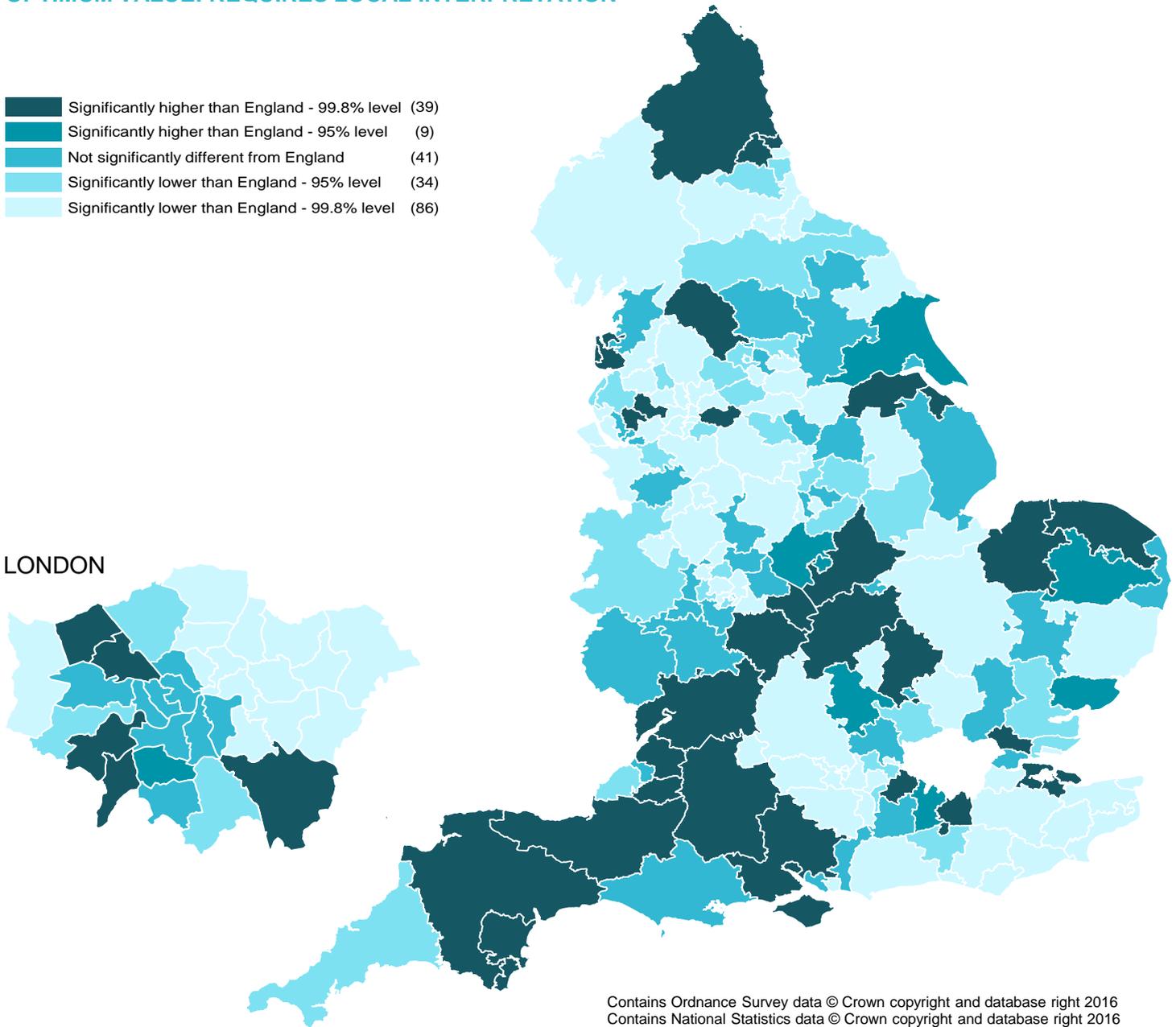
**MAP 27: Rate of urodynamic (pressures and flows) tests undertaken per weighted population by CCG**

Adjusted for age, sex and 'need', January–March 2016

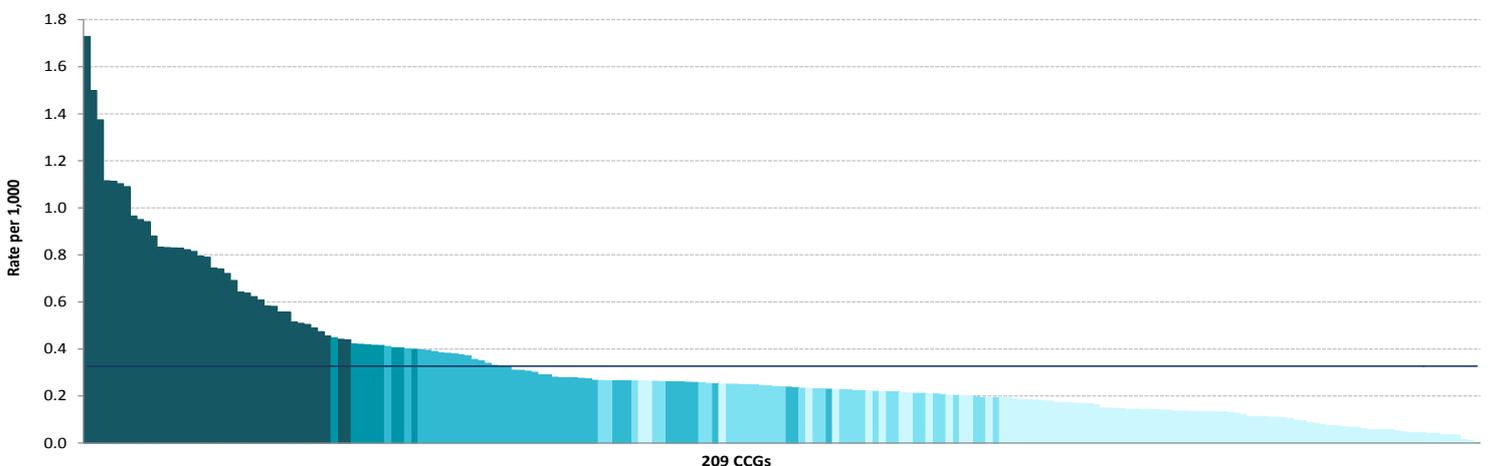
Domain 2: Enhancing quality of life for people with long-term conditions

**OPTIMUM VALUE: REQUIRES LOCAL INTERPRETATION**

- Significantly higher than England - 99.8% level (39)
- Significantly higher than England - 95% level (9)
- Not significantly different from England (41)
- Significantly lower than England - 95% level (34)
- Significantly lower than England - 99.8% level (86)



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## Context

Urodynamic testing is an umbrella term, which predominantly involves the measurement of pressure and flow. It enables the clinician to determine what physical factors are involved in bladder disorders. This is important, for example, in the diagnosis of different types of incontinence for which there are different indicated treatments. Urodynamic testing allows the patient to be offered the optimal therapy. The largest groups of patients undergoing urodynamic tests are:

- men with bladder outlet obstruction
- women with incontinence

The underlying conditions that require urodynamic tests are more prevalent in older people.

There was a small decrease of 0.28% per annum in the rate of urodynamic (pressures and flows) testing from January 2007 to March 2013<sup>1</sup>. This indicates no substantial trend in the short to medium term, with the average rate of testing of 1.75 tests per 1000 weighted population. This rate may need to increase in future to reflect an increase in the prevalence and incidence of key conditions as the population ages. Within the next ten years ONS projections predict that the number of people over 60 years of age will have increased by around 22%.<sup>2</sup>

Data for this indicator is taken from DM01, which collects data only on standard urodynamic tests (cystometrograms, video-cystometrograms and ambulatory urodynamics) and not on a less-

specialised test known as uroflowmetry (free flow rate).

## Magnitude of variation

The map and column chart display the latest period (2015/16 Q4), during which CCG values ranged from 0.0 per 1,000 weighted population to 1.73 per 1,000 weighted population. The England value for this period was 0.33 per 1,000 weighted population .

The boxplot shows the distribution of CCG values for the period 2013/14 to 2015/16 by quarter.

There was a very slight narrowing of 75th to 25th percentile gap, which was statistically significant owing to the relatively high number of periods over which the narrowing was observed.

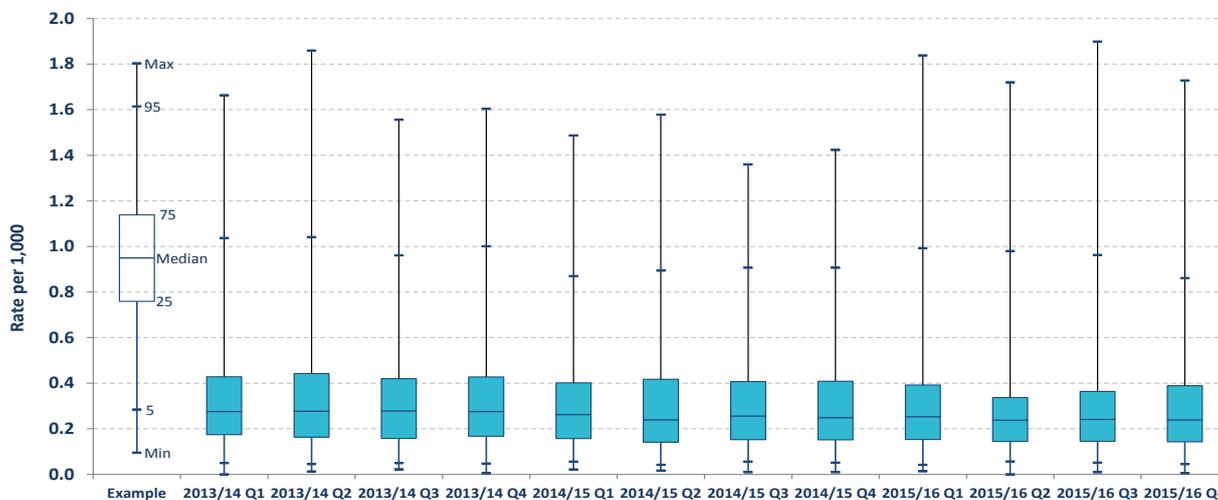
There was no significant change in the maximum to minimum range nor in the 95th to 5th percentile gap.

There was a small decrease in the median, which was statistically significant owing to the steady nature of the fall and the relatively high number of periods over which the decrease was observed.

Possible reasons for the degree of variation observed include differences in:

- presence of a large spinal injury unit – localities with or near such units have high rates of testing
- presence of a tertiary centre for continence – localities with or near such centres have rates of testing above average

Map 27: Boxplot of rate of urodynamic tests by CCG



	Example	2013/14 Q1	2013/14 Q2	2013/14 Q3	2013/14 Q4	2014/15 Q1	2014/15 Q2	2014/15 Q3	2014/15 Q4	2015/16 Q1	2015/16 Q2	2015/16 Q3	2015/16 Q4	
Max-Min (Range)		1.66	1.85	1.53	1.60	1.47	1.56	1.35	1.41	1.82	1.72	1.89	1.72	No significant change
95th-5th percentile		0.99	1.00	0.91	0.95	0.81	0.85	0.85	0.86	0.95	0.92	0.91	0.82	No significant change
75th-25th percentile		0.25	0.28	0.26	0.26	0.24	0.28	0.26	0.26	0.24	0.19	0.22	0.25	NARROWING Significant
Median		0.28	0.28	0.28	0.28	0.26	0.24	0.26	0.25	0.25	0.24	0.24	0.24	DECREASING Significant

<sup>1</sup> RightCare. The NHS Atlas of Variation in Diagnostic Services November 2013; page 113 and Figure 27.1 on page 191.

<sup>2</sup> Office of National Statistics, Subnational population projections for England: 2014-based projections

- capacity, including availability of departments, trained staff and appropriate equipment, for example, the number of tests performed each month in some services can often be explained by the presence of key members of staff
- lack of national guidelines about which diagnostic tests need to be performed in patients with bladder outlet obstruction and incontinence

## Options for action

At present there are few guidelines about where and how the urodynamic (pressures and flows) tests should be used (NICE CG171 and CG148, International Continence Society and European Association of Urology; see 'Resources'). There is an urgent need to develop improved professional guidelines and/or agreements on local pathways and models of care.

The focus for commissioners is to ensure equity of access to services:

- if basic urodynamic tests can be easily and more conveniently carried out in primary care, commissioners need to investigate this option where it has the potential to increase access and reduce unwarranted variation
- by reviewing local capacity in relation to demography, especially the proportion of older people and whether that will increase in future

Commissioners and service providers need to consider developing local models and pathways for how urodynamic tests are used in key diagnostic and treatment pathways.

Service providers need to address quality and productivity in local services via participation in the national accreditation scheme, Improving Quality in Physiological Services (IQIPS; see 'Resources').

## RESOURCES

- NICE. Urinary incontinence in women: management. NICE guidelines [CG171]. Published: September 2013. Last updated: November 2015. <https://www.nice.org.uk/guidance/cg171>
- NICE Pathways. Urinary incontinence in women overview. <http://pathways.nice.org.uk/pathways/urinary-incontinence-in-women>
- NICE. Urinary incontinence in neurological disease: diagnosis and management. NICE guidelines [CG148]. August 2012. <https://www.nice.org.uk/guidance/cg148>
- NICE Pathways. Urinary incontinence in neurological disease overview. <http://pathways.nice.org.uk/pathways/urinary->

## [incontinence-in-neurological-disease](#)

- Rosier PFWM, Schaefer W, Lose G et al. International Continence Society Standard: Good Urodynamic Practices and Terms 2015. Urodynamics, Uroflowmetry, Cystometry and Pressure-Flow Study. [www.ics.org/Documents/DocumentsDownload.aspx?DocumentID=3077](http://www.ics.org/Documents/DocumentsDownload.aspx?DocumentID=3077)
- Homma Y (Chairman) Urodynamics. International Continence Society. [http://www.ics.org/publications/ici\\_2/chapters/chap07.pdf](http://www.ics.org/publications/ici_2/chapters/chap07.pdf)
- Lucas MG (Chair) Bedretdinova D, Bosch JLHR et al. Guidelines on Urinary Incontinence. European Association of Urology. April 2014. [https://uroweb.org/wp-content/uploads/20-Urinary-Incontinence\\_LR.pdf](https://uroweb.org/wp-content/uploads/20-Urinary-Incontinence_LR.pdf)
- Improving Quality in Physiological Services (IQIPS). <https://www.iqips.org.uk/>

**PHYSIOLOGICAL SERVICES**

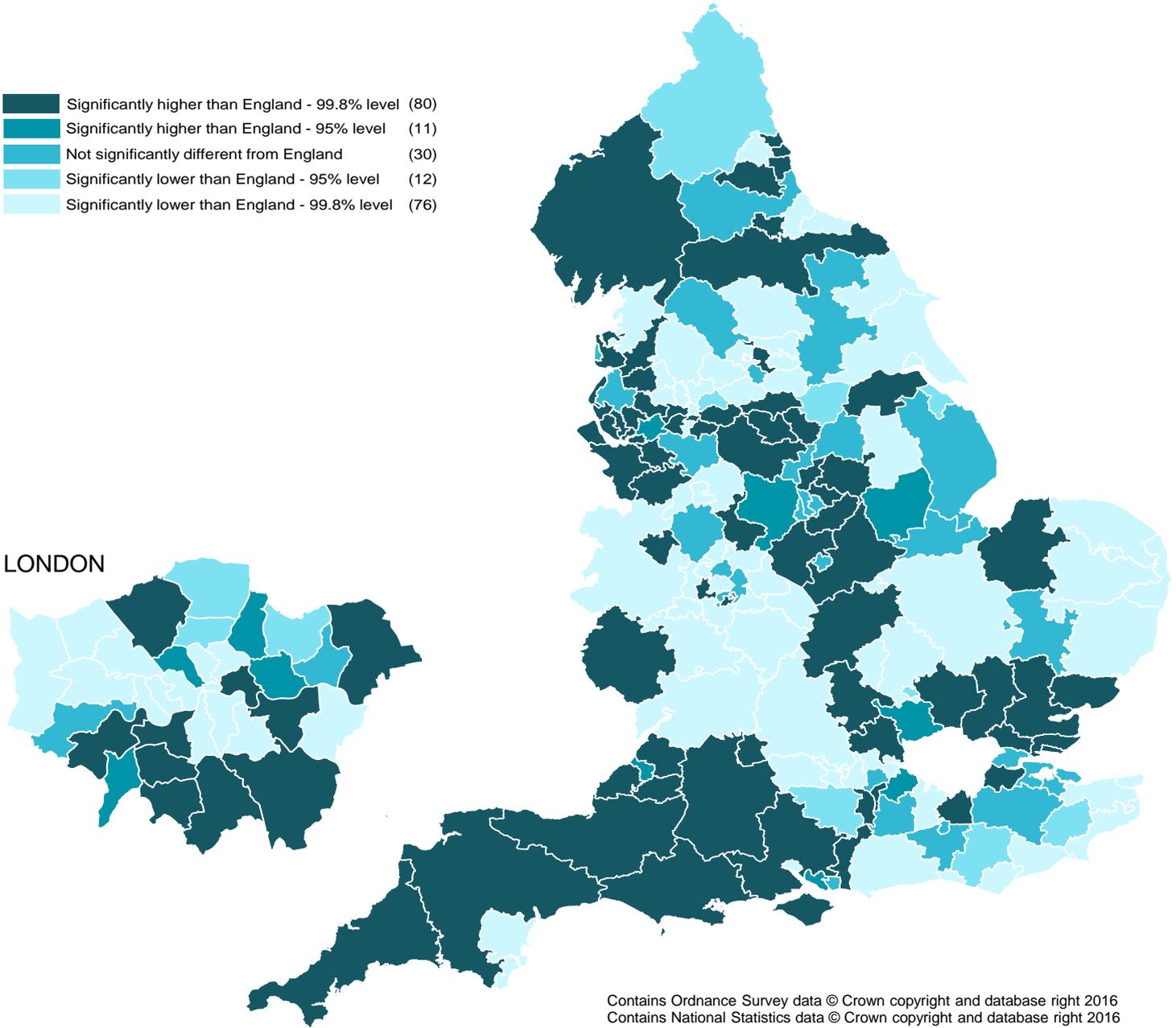
**MAP 28: Rate of echocardiography activity undertaken per weighted population by CCG**

Adjusted for age, sex and 'need', January–March 2016

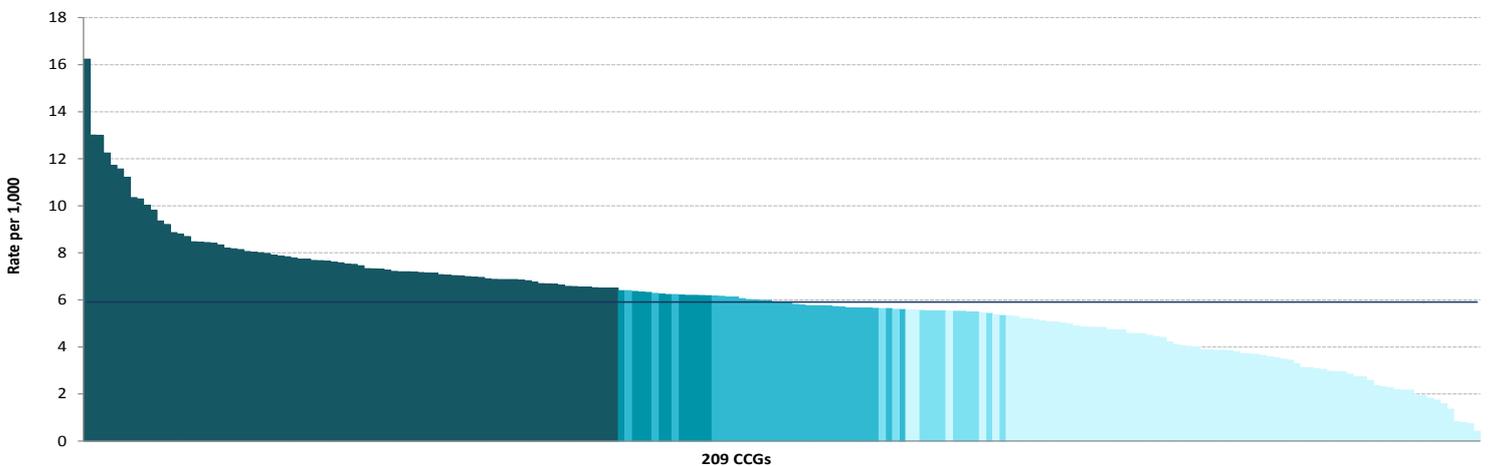
Domain 2: Enhancing quality of life for people with long-term conditions

**OPTIMUM VALUE: REQUIRES LOCAL INTERPRETATION**

- Significantly higher than England - 99.8% level (80)
- Significantly higher than England - 95% level (11)
- Not significantly different from England (30)
- Significantly lower than England - 95% level (12)
- Significantly lower than England - 99.8% level (76)



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## Context

Echocardiography uses ultrasound to produce images that diagnose or exclude abnormalities of the heart and major thoracic vessels. Trans-thoracic echocardiography (TTE) uses a probe placed on the chest, whereas trans-oesophageal echocardiography (TOE) uses a probe passed into the oesophagus. Both techniques measure the size, structure and function of the heart's chambers, valves and major blood vessels, and detect congenital anomalies.

Currently, the vast majority of echocardiograms are performed in hospital, although provision in primary care is increasing.

There was an increase of 43.0% in the commissioning of echocardiography from January 2007 to March 2013<sup>1</sup>. Future demand is expected to rise for the following reasons:

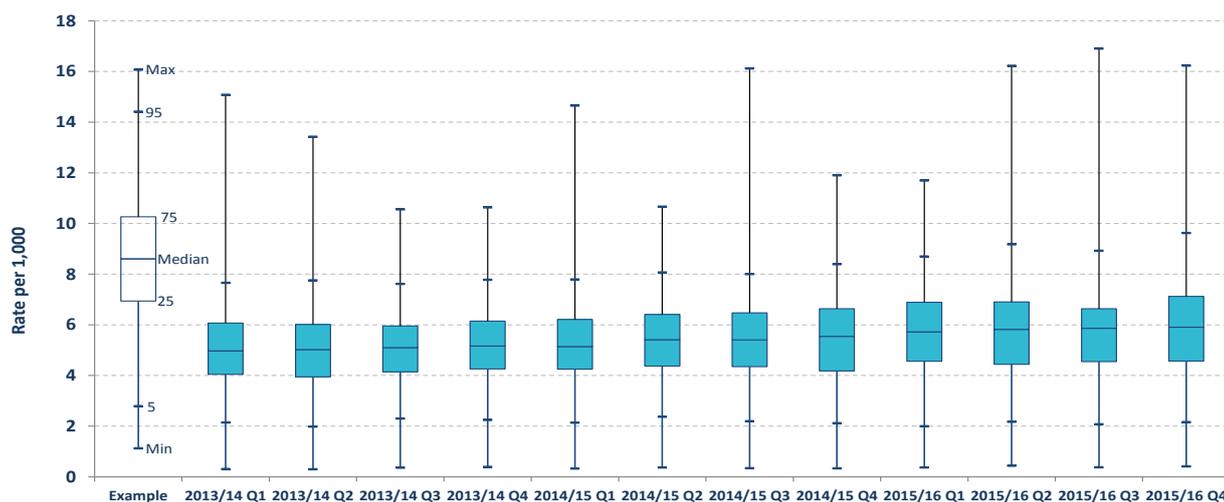
- population ageing: (i) the incidence of heart failure increases with age, with an average age at first diagnosis of 76 years.<sup>2</sup> Heart failure is the leading cause of hospitalisation in people aged over 65 years<sup>3</sup>, and an increase of 50% in the number of hospital admissions due to heart failure is projected to occur over the next 25 years.<sup>4</sup> Echocardiography is central both to the

diagnosis of heart failure and to determining the aetiology<sup>5</sup>; (ii) valvular heart disease also increases with age, is underdiagnosed, and echocardiography is the principal test for detection and continued surveillance

- new indications for routine use of echocardiography: (i) monitoring cardiac side-effects of new drugs (such as Herceptin treatment for breast cancer); (ii) supplementing clinical management in acute and critical care and before surgery
- increasing life expectancy of patients with congenital heart disease
- demand for stress echocardiography in coronary heart disease<sup>6</sup>
- care pathways that promote the use of echocardiography in primary care (such as for heart failure)

The use of echocardiography to investigate heart failure is lower in the UK than in other European countries. In the Euro Heart Survey<sup>7</sup> around 35% of UK patients with acute heart failure were investigated by echocardiography compared with an average of 55% across Europe<sup>8</sup>.

Map 28: Boxplot of echocardiographic activity by CCG



	Example	2013/14 Q1	2013/14 Q2	2013/14 Q3	2013/14 Q4	2014/15 Q1	2014/15 Q2	2014/15 Q3	2014/15 Q4	2015/16 Q1	2015/16 Q2	2015/16 Q3	2015/16 Q4	
Max-Min (Range)		14.8	13.1	10.2	10.2	14.3	10.3	15.8	11.6	11.3	15.8	16.5	15.8	No significant change
95th-5th percentile		5.5	5.8	5.3	5.5	5.7	5.7	5.8	6.3	6.7	7.0	6.8	7.5	WIDENING Significant
75th-25th percentile		2.0	2.1	1.8	1.9	2.0	2.0	2.1	2.5	2.3	2.5	2.1	2.6	WIDENING Significant
Median		5.0	5.0	5.1	5.2	5.1	5.4	5.4	5.5	5.7	5.8	5.9	5.9	INCREASING Significant

<sup>1</sup> RightCare. The NHS Atlas of Variation in Diagnostic Services November 2013; page 115 and Figure 28.1.

<sup>2</sup> Cowie MR, Wood DA, Coats AJS et al. Incidence and aetiology of heart failure. A population-based study. *European Heart Journal* 1999; 20: 421-428. <http://www.bhf.org.uk/publications/view-publication.aspx?ps=1000626>

<sup>3</sup> NICE. Acute heart failure: diagnosis and management. NICE guidelines [CG187]. October 2014. <https://www.nice.org.uk/guidance/CG187>

<sup>4</sup> NICE. Chronic heart failure in adults: management. NICE guidelines [CG108]. August 2010. <https://www.nice.org.uk/guidance/CG108>

<sup>5</sup> McMurray JJV, Adamopoulos S, Anker SD et al. ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure 2012. doi: <http://dx.doi.org/10.1093/eurheartj/ehs104> 1787-1847 First published online: 19 May 2012. <http://eurheartj.oxfordjournals.org/content/33/14/1787>

<sup>6</sup> NICE. Chest pain of recent onset: assessment and diagnosis. NICE guidelines [CG95]. March 2010. <https://www.nice.org.uk/guidance/CG95>

<sup>7</sup> European Society of Cardiology. Euro Heart Survey. <http://www.escardio.org/guidelines-surveys/ehs/Pages/welcome.aspx>

<sup>8</sup> The Euro Heart Failure survey programme - a survey on the quality of care among patients with heart failure in Europe. Part 1: patient characteristics and diagnosis. *European Heart Journal* 2003; 24: 442-463. <http://eurheartj.oxfordjournals.org/content/24/5/442>

Furthermore use in the UK is substantially lower than that in the US, where performance of TTE is associated with lower mortality across a range of cardiovascular diseases, and yet the intervention is still considered to be underutilised.<sup>9</sup>

NICE guidance recommends that a brain natriuretic peptide (BNP) blood test be used to help rule out heart failure<sup>4</sup>, but it has not reduced the demand for echocardiography for various reasons including:

- an echocardiogram has to be performed when the BNP test result is abnormal<sup>4</sup>, and the number of BNP tests is rising
- echocardiography helps to identify the cause of heart failure, not simply its presence
- the specificity of BNP means that it is not able to replace echocardiography

## Magnitude of variation

The map and column chart display the latest period (January-March 2016), during which CCG values range from 0.4 to 16.2 per 1,000 weighted population, which is a 39.5-fold difference between CCGs. The England value for this quarter was 5.9 per 1,000 weighted population.

The boxplot shows the distribution of CCG values for the period 2013/14 to 2015/16 by quarter.

There was a small but significant widening of the 95th to 5th percentile gap, and of the 75th to 25th percentile gap. This means that the dispersion of CCG echocardiography rates increased slightly both at the extremities and in the central part of the distribution.

There was no significant change in the maximum to minimum range.

There was a small but steady and statistically significant increase in the median of CCG rates from 5.0 to 5.9 per 1,000 weighted population.

The degree of variation observed may be explained, for example, by differences in:

- the size and structure of local and regional echocardiography departments
- levels of echocardiography provided in the community
- the availability of appropriately trained staff
- care pathways involving the use of

echocardiography

- criteria/policies adopted for case selection
- the adequacy of training provided in echocardiography departments
- patient access

## Options for action

To reduce unwarranted variation in echocardiography, commissioners need to consider:

- supporting services in centres that are actively training, and have a track record of producing qualified echocardiographers
- confirming that a centre has adequate and sustainable capacity and staffing
- supporting services in community settings (with appropriate clinical governance and quality control), which may be more convenient for patients
- requiring robust data collection to quantify local incidence and prevalence of cardiovascular disease and to monitor demand and patient outcomes over time
- using commissioning levers to improve quality, for example, by encouraging participation in the national accreditation scheme, Improving Quality in Physiological Services (IQIPS; see 'Resources')

## RESOURCES

- NICE. Acute heart failure: diagnosis and management. NICE guidelines [CG187]. October 2014. <https://www.nice.org.uk/guidance/CG187>
- NICE Pathways. Acute heart failure overview. <http://pathways.nice.org.uk/pathways/acute-heart-failure>
- NICE. Chronic heart failure in adults: management. NICE guidelines [CG108]. August 2010. <https://www.nice.org.uk/guidance/CG108>
- NICE Pathways. Chronic heart failure overview. <http://pathways.nice.org.uk/pathways/chronic-heart-failure>
- McMurray JJV, Adamopoulos S, Anker SD et al. ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure 2012. doi: <http://dx.doi.org/10.1093/eurheartj/ehs104> 1787-1847 First published online: 19 May 2012. <http://eurheartj.oxfordjournals.org/content/33/14/1787>
- Improving Quality in Physiological Services (IQIPS). <https://www.iqips.org.uk/>

PHYSIOLOGICAL SERVICES

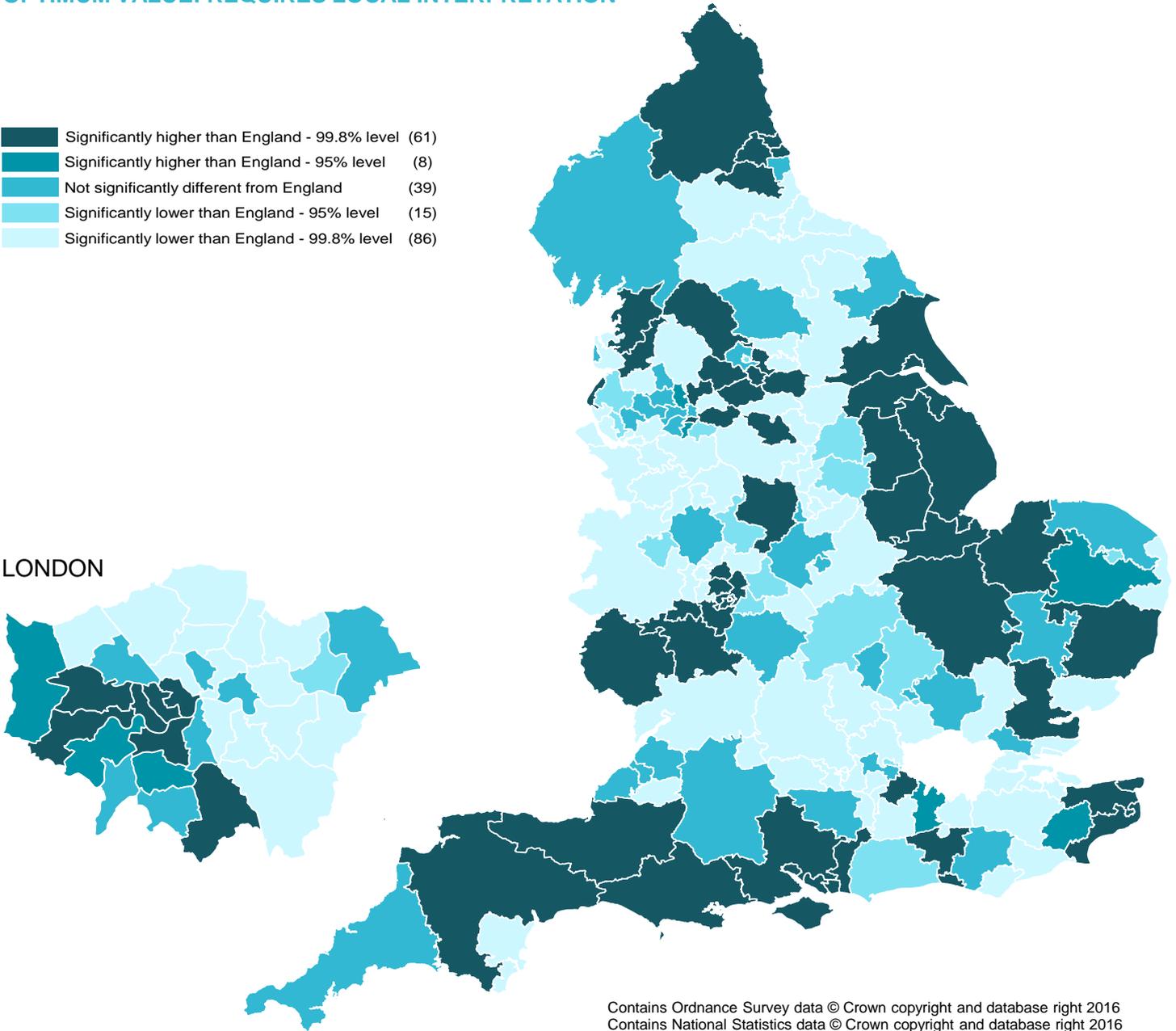
**MAP 29: Rate of peripheral neurophysiology tests undertaken per weighted population by CCG**

Adjusted for age, sex and 'need', January–March 2016

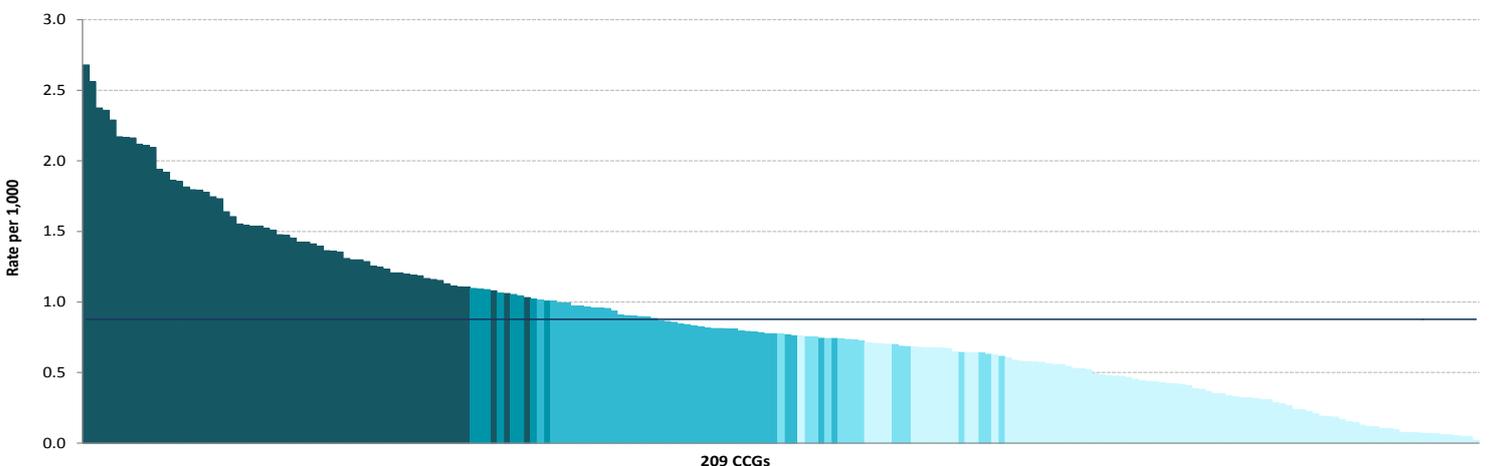
Domain 2: Enhancing quality of life for people with long-term conditions

**OPTIMUM VALUE: REQUIRES LOCAL INTERPRETATION**

- Significantly higher than England - 99.8% level (61)
- Significantly higher than England - 95% level (8)
- Not significantly different from England (39)
- Significantly lower than England - 95% level (15)
- Significantly lower than England - 99.8% level (86)



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## Context

Peripheral neurophysiology is concerned with the peripheral neuromuscular system only. The core tests provided by clinical neurophysiology departments in peripheral neurophysiology are:

- nerve conduction studies (NCS)
- electromyography

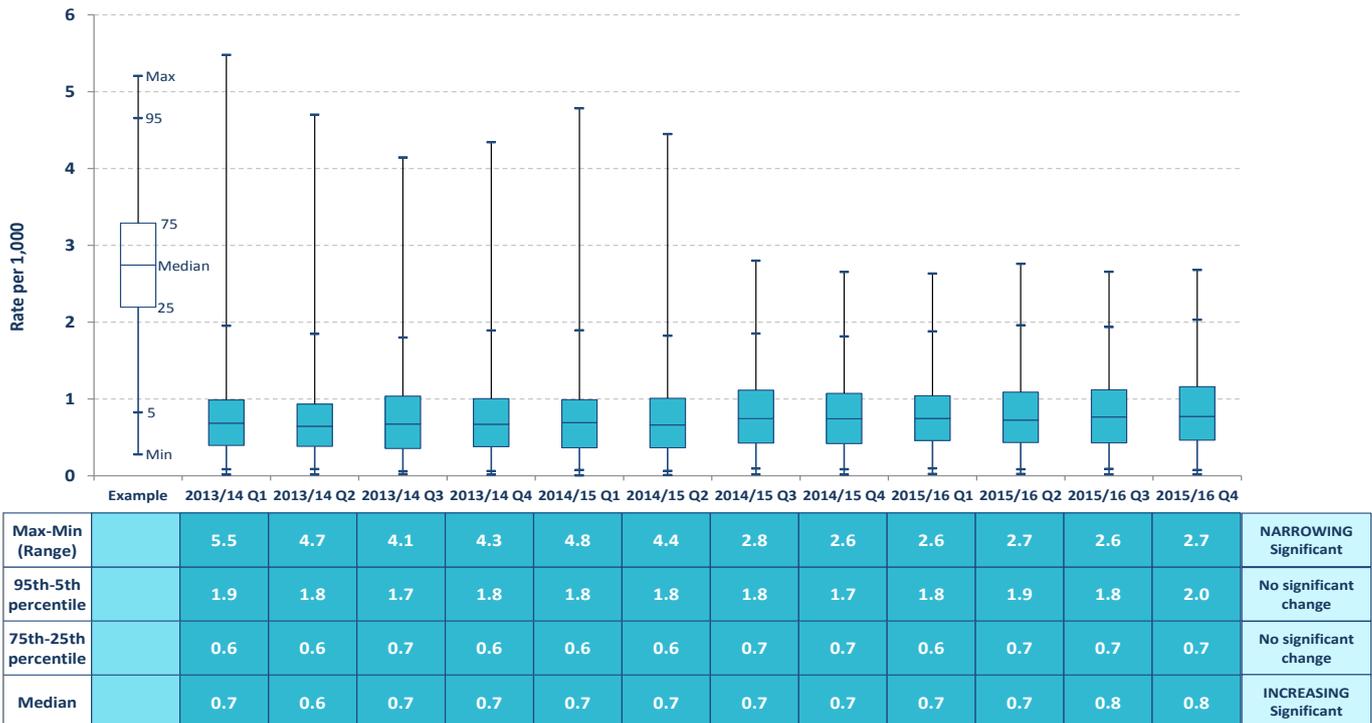
Nerve conduction studies involve electrical stimulation of peripheral nerves with recording of responses from nerves and muscles. It is used to investigate a range of peripheral nerve and muscle disorders, the most common of which is carpal tunnel syndrome (CTS), the entrapment of the median nerve as it passes through the carpal tunnel in the wrist.<sup>1</sup>

The annual incidence of CTS is about 1-3 presentations per 1,000 population in England. The average annual incidence of neurophysiologically confirmed CTS in East Kent from 1991 to 2001, corrected to the World Health Organization standard population, was 1.2 per 1,000 population for women and 0.6 per 1,000 population for men.<sup>2</sup> Carpal tunnel syndrome affects up to 3.5% of the population in England. In southern Sweden Atroshi et al found a prevalence of 3.8% for 'clinically certain' CTS and a prevalence of 2.7% for 'electrophysiologically confirmed' CTS.<sup>3</sup>

Across England about 50% of NCS are related to CTS and 10% to ulnar nerve testing. In localities where there is no access to NCS through a CTS care pathway or the pathway does not involve a clinical neurophysiology service, patients with CTS are often seen by an orthopaedic surgeon who may not use NCS to inform the decision to operate. In the absence of a large prospective randomised controlled trial of the value of pre-surgical NCS, it is not possible to identify the exact contribution NCS makes to surgical success, as defined by whether patients consider their condition improved or cured. In 'ordinary' practice, surgical decompression has excellent results in only 75% of cases of CTS.<sup>4</sup> In a study of 6,263 patients in East Kent the surgical success rate for orthopaedic carpal tunnel decompression was 77%,<sup>5</sup> whereas that for 543 patients whose surgical management included NCS was 88%.<sup>6</sup> It is likely, however, that a correct diagnosis or classification of CTS by peripheral neurophysiology leads to better clinical outcomes.

Electromyography is a mildly invasive procedure, involving the insertion of a needle into muscle, which can help to elicit the causes of muscle weakness and other muscle symptoms such as pain and involuntary movements.

Map 29: Boxplot of rate of peripheral neurophysiology tests by CCG



<sup>1</sup> Browning P. Carpal Tunnel Syndrome Imaging. <http://www.emedicine.com/radio/topic135.htm>  
<sup>2</sup> Bland JDP, Rudolfer SM. Clinical surveillance of carpal tunnel syndrome in two areas of the United Kingdom, 1991-2001. J Neurol Neurosurg Psychiatry 2003; 74: 1674-1679. <http://jnnp.bmj.com/content/74/12/1674.full.pdf>  
<sup>3</sup> Atroshi I, Gummesson C, Johnsson R et al. Prevalence of carpal tunnel syndrome in a general population. JAMA 1999; 282: 153-158. <http://www.ncbi.nlm.nih.gov/pubmed/10411196>  
<sup>4</sup> Bland JD. Treatment of carpal tunnel syndrome. Muscle Nerve 2007; 36: 167-171. <http://www.ncbi.nlm.nih.gov/pubmed/17534984>  
<sup>5</sup> East Kent Hospitals University NHS Foundation Trust. Carpal-Tunnel.net. Surgical Prognosis. <http://www.carpal-tunnel.net/treatments/sprognosis>  
<sup>6</sup> Information received from Jeremy Bland, East Kent Hospitals University NHS Foundation Trust.

There was a 2.7% increase in the commissioning of peripheral neurophysiology testing from January 2007 to March 2013<sup>7</sup>; in some localities where there is good availability of the service there was a much greater increase in the rate of provision.

## Magnitude of variation

The map and column chart display the latest period (January-March 2016), during which CCG values ranged from 0.0 to 2.7 per 1,000 weighted population, which is a 144.6-fold difference between CCGs. The England value for this quarter was 0.9 per 1,000 weighted population.

The boxplot shows the distribution of CCG values for the period 2013/14 to 2015/16 by quarter.

The range between the maximum and minimum values narrowed significantly which was entirely due to a dramatic step down and subsequent plateauing in the maximum CCG value from the October-December 2014 quarter onwards.

There was no significant change in the 95th to 5th percentile gap nor in the 75th to 25th percentile gap.

There was a small but steady and statistically significant increase in the median of CCG rates from 0.7 to 0.8 per 1,000 weighted population.

Reasons for the degree of variation observed are differences in:

- availability of clinical neurophysiology services – localities with or near a large department tend to have higher rates of testing (variation in the rates of EEG testing is likely to mirror the variation in peripheral neurophysiology testing)
- service models and pathways for the use of clinical neurophysiology in key diagnostic pathways, the most important being the management of CTS – some localities always manage CTS using peripheral neurophysiology whereas other localities never use peripheral neurophysiology to manage CTS
- access to NCS through local CTS care pathways
- clinical practice – both consultant clinical neurophysiologists and clinical physiologists can perform and report investigations, which affects level of access to and cost of the service
- availability of and access to appropriate staff – at present the provision of training programmes for medical and skilled clinical physiologists is not keeping pace with a combination of factors in particular the expansion of services and the numbers of people leaving the service or retiring

- regional referral rates
- the balance between the public and private provision of services – in localities where the provision of clinical neurophysiology services appears to be low, there is likely to be a private sector or alternative service available

## Options for action

Commissioners need to review referral and delivery models across neurophysiology services. To reduce unwarranted variation in neurophysiology test activity, commissioners could consider:

- developing robust data collection systems to improve understanding of the incidence and prevalence of conditions of the peripheral neuromuscular system in the local population
- reviewing funding models (for example, outcomes versus activity-based payments) to ensure there are no perverse financial incentives to appropriate service delivery
- assessing future demand and current capacity for local neurophysiology services to ensure the availability of services and equity of access
- investigating new service models that have appropriate governance and/or audit arrangements in place to ensure a high-quality of service is maintained, for example, undertaking most CTS activity through clinical physiologist-led clinics
- using commissioning levers to improve quality, for example, through schemes such as Improving Quality in Physiological Services (IQIPS; see 'Resources')

## RESOURCES

- Improving Quality in Physiological Services <https://www.iqips.org.uk/>