Quick user guide

Maps

1. **Type of statistic** (e.g. rate, proportion)
2. **Geographic boundaries**
3. **Year of data presented**
4. **Rate calculated per x number of people**
5. **Optimum values** Low indicates lower values are preferential (high indicates higher values are preferential). Local interpretation maybe required for some indicators.

Map 1a: Experimental statistic: Variation in rate of all vision outpatient attendances by clinical commissioning group (2019/20)

1 Directly standardised rate per 100,000 population 4
Optimum value: Requires local interpretation 5

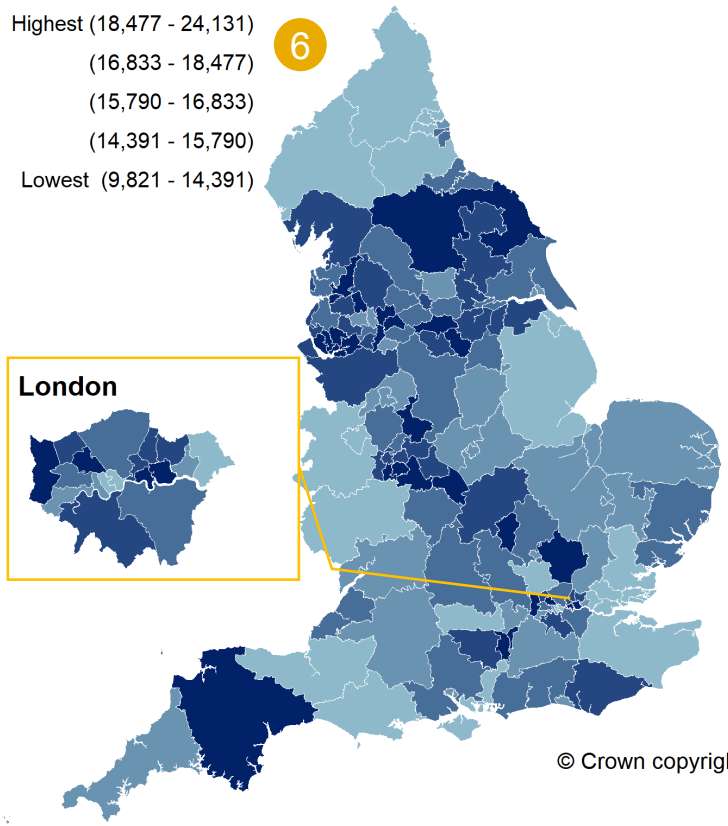
2

3

Equal-sized quintiles of geographies

Highest (18,477 - 24,131)
(16,833 - 18,477)
(15,790 - 16,833)
(14,391 - 15,790)
Lowest (9,821 - 14,391)

6

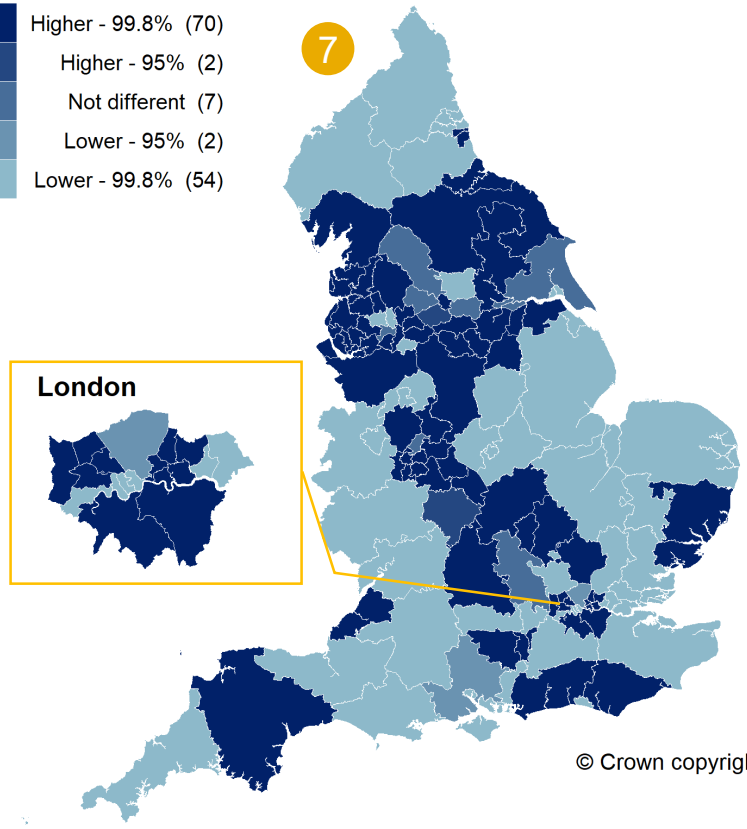


Significance level compared with England

Higher - 99.8% (70)
Higher - 95% (2)
Not different (7)
Lower - 95% (2)
Lower - 99.8% (54)

7

8



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

   For example, in 2020 there were 135 clinical commissioning groups (CCGs), so 27 CCGs are in each category. Darker areas have the highest values.

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

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

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

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

Quick user guide

Chart, box plot and table

1. Title shows indicator details including: value type, geography and year.
2. The y-axis plots the value and gives details of the value type e.g. rate / proportion and the unit e.g. per 100,000 population.
3. The x-axis shows the geography and the number of areas on chart.
4. The line shows the England average.
5. Each bar represents an area (e.g. a CCG). The height of the bar is relative to the value for that area. Collectively, the bars show the spread of values across England.

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

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

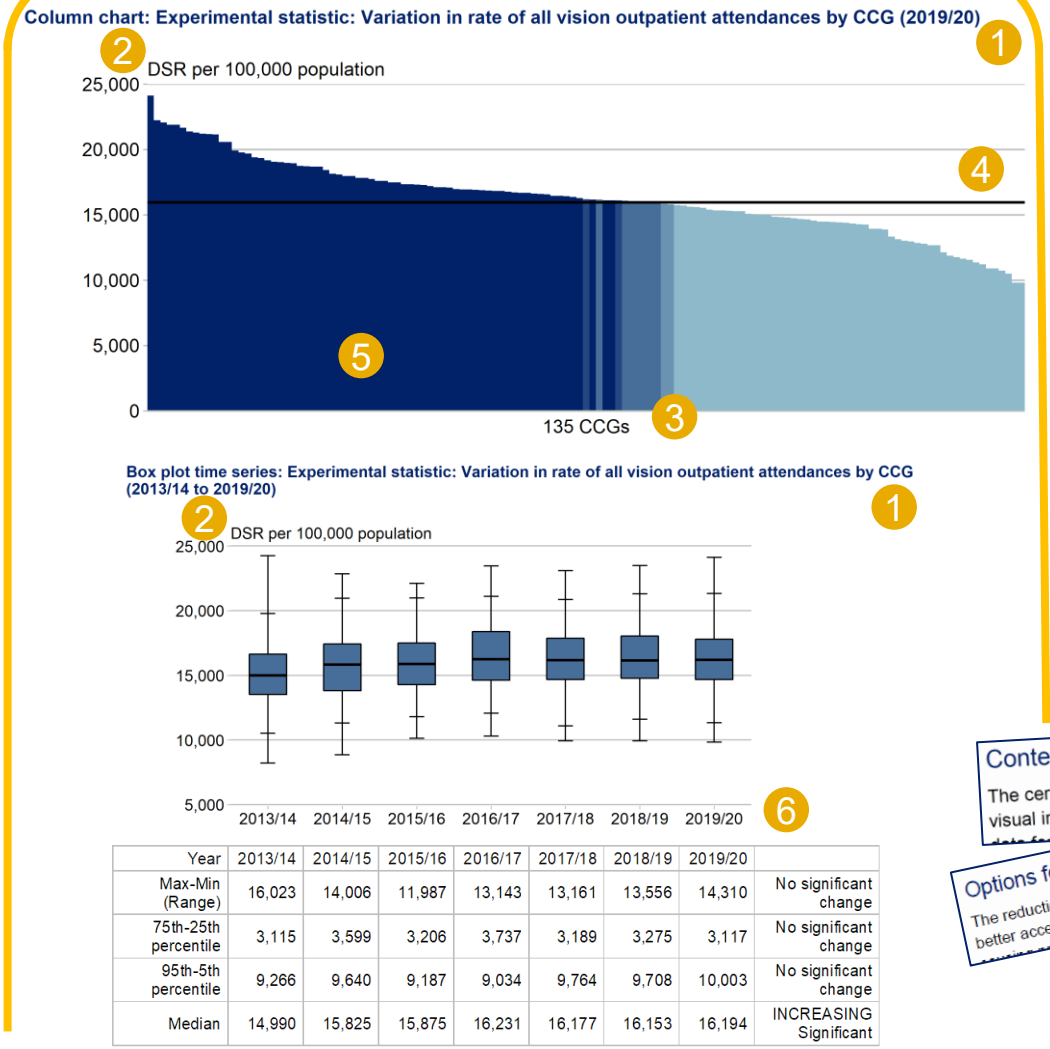
   Where the significance bar chart is unavailable, the equal interval map colours have been used.
6. For each indicator, data is presented visually in a time series of box and whisker plots. The box plots show the distribution of data.

   The line inside each box shows the median (the mid-point, so if the 135 CCGs were sorted in order of value, the value halfway between the CCGs in the 67th and 68th position would give the median). The bottom and top of the blue box represents the values which 25% and 75% of the areas fall below. 50% of the areas have a value within this range.

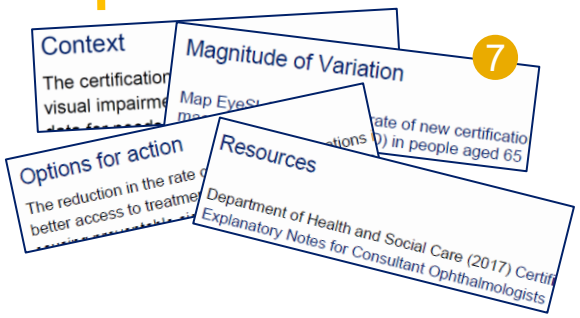
   The whiskers mark the values at which 5% and 95% of areas fall below. The median and maximum values are also shown.

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

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



Year	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	
Max-Min (Range)	16,023	14,006	11,987	13,143	13,161	13,556	14,310	No significant change
75th-25th percentile	3,115	3,599	3,206	3,737	3,189	3,275	3,117	No significant change
95th-5th percentile	9,266	9,640	9,187	9,034	9,764	9,708	10,003	No significant change
Median	14,990	15,825	15,875	16,231	16,177	16,153	16,194	INCREASING Significant



7. **Sections in the chapter**

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

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

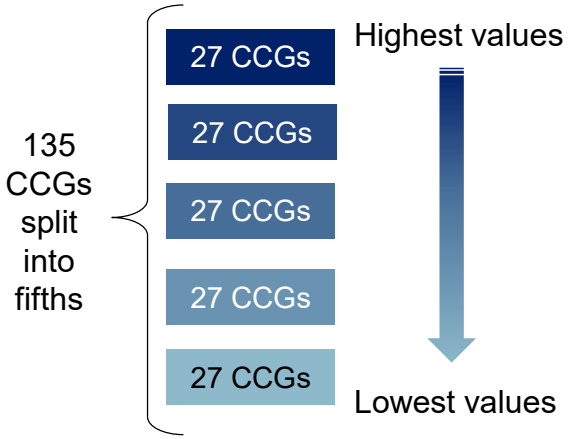
   Options for action – suggestions for best practice

   Resources – links to useful documents

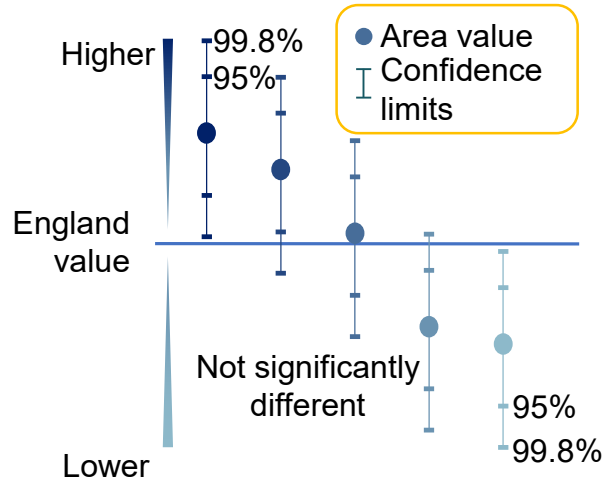
Quick user guide

How were the categories calculated?

Equal-sized quintiles



Significance to England



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

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

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

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

Box & whisker plot

Whiskers
Show the extreme values in the dataset.

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

Maximum The value of the area with the highest value.

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

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

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

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

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

Minimum The value of the area with the lowest value.

Box plot percentile	CCG rank position (135 CCGs in 2020)
Max	135
95%	Mid value between values of CCGs in ranks 128 and 129
75%	Mid value between values of CCGs in ranks 101 and 102
50% - Median	Mid value rank 68
25%	Mid value between values of CCGs in ranks 34 and 35
5%	Mid value between values of CCGs in ranks 7 and 8
Min	1

Population at risk of poor eye health

Social isolation and loneliness

Context

Social isolation and loneliness lead to significant adverse health consequences. Loneliness is a known risk factor for comorbid chronic illnesses,[1] greater risk of cognitive decline and dementia,[2] falls, and mortality.[3] Visual impairment may predispose individuals to social isolation and loneliness in a number of ways; good visual acuity is often required for many social and functional activities such as driving, exercising, using a telephone or watching television. Reduced mobility and functional limitations (both potential consequences of visual impairment) can directly result in social isolation by reducing access to social networks.[4]

Risk of isolation and loneliness increases with age.[5] Females are particularly at risk given they live longer than men on average[6] and often outlive male spouses[7] and being widowed, divorced or unmarried is a strong predictor of social isolation.[8] Vision loss has been indirectly linked to social isolation and is bidirectional. Visual impairment is associated with reduced social interaction[9] and decreased social network size[10] and inversely social isolation is also related to poorer eye health.[11] Consequently, people with poor vision are at risk of reduced access to healthcare and subsequent depreciating vision and poorer health outcomes. This is particularly pertinent in light of the recent coronavirus (COVID-19) pandemic.

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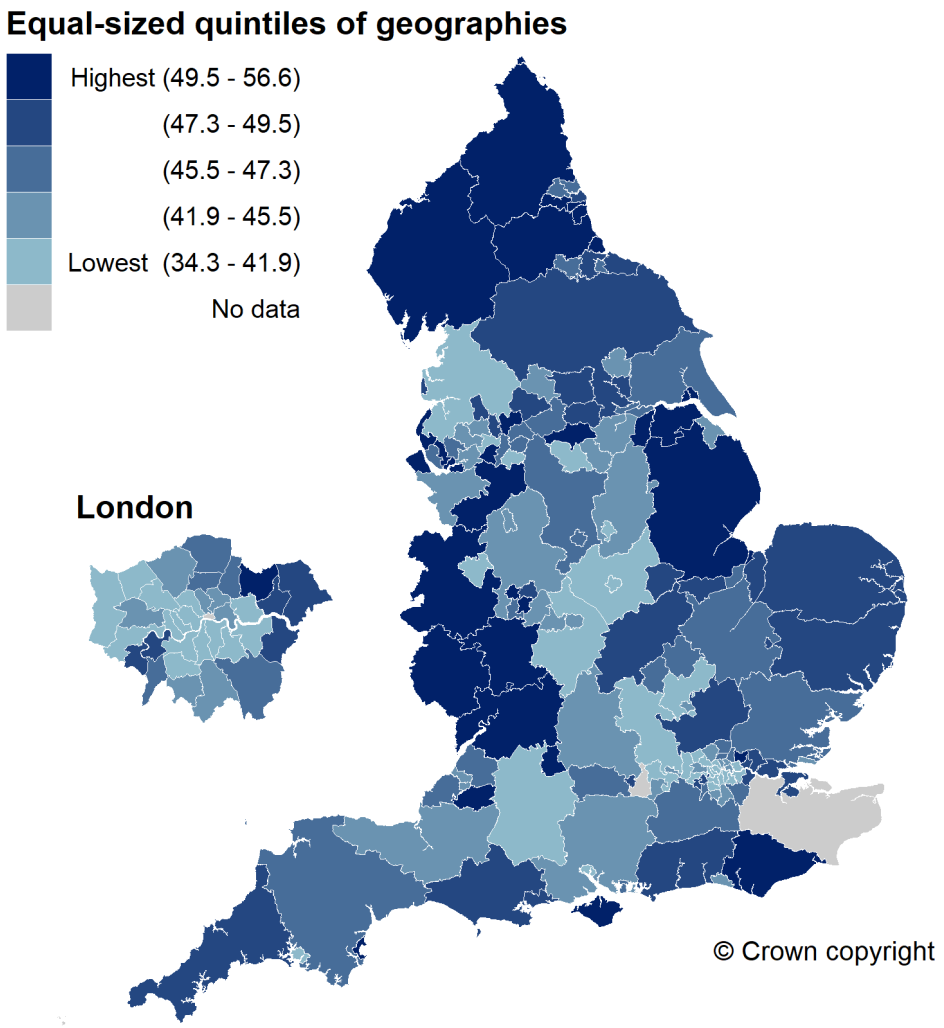
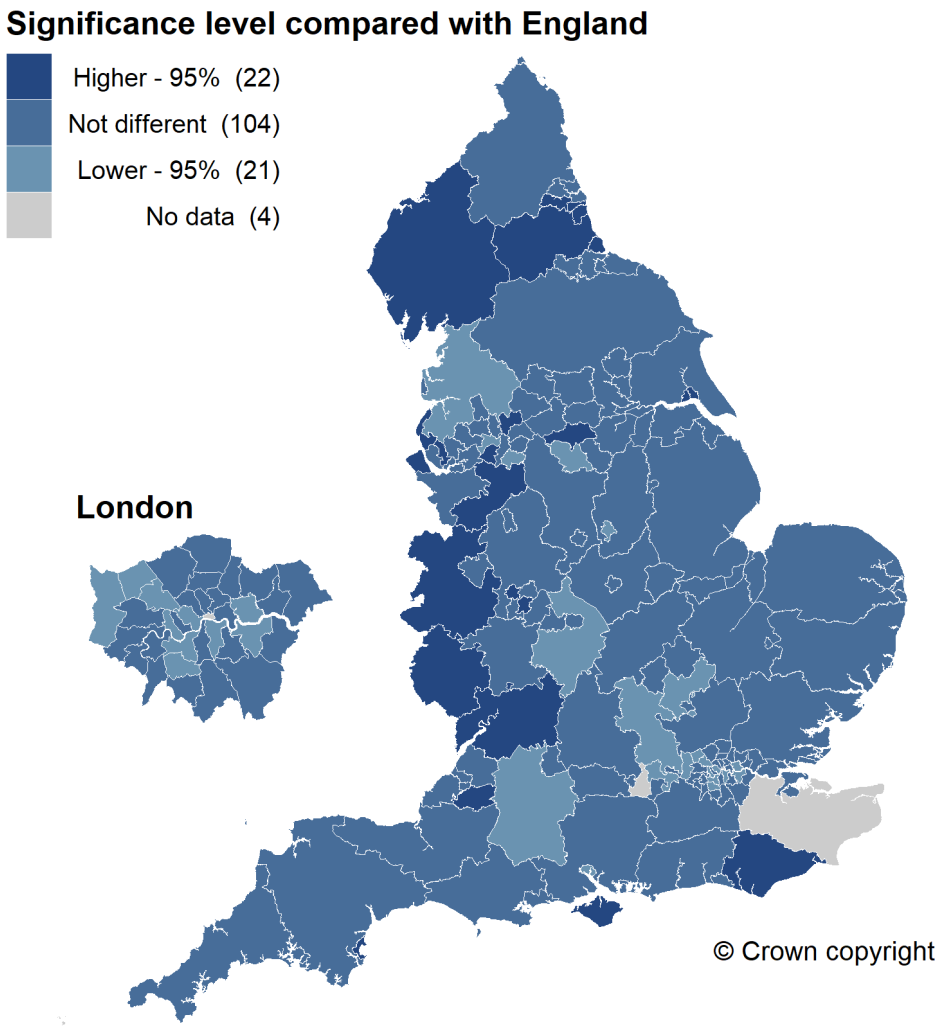
[1] Valtorta NK, Kanaan M, Gilbody S, and others (2016) Loneliness and social isolation as risk factors for coronary heart disease and stroke: systematic review and meta-analysis of longitudinal observational studies Heart 2016 Apr;102(13):1009-1016 [Accessed 17 Jun 2021]
[2] Cacioppo JT and Cacioppo S (2014) Older adults reporting social isolation or loneliness show poorer cognitive function 4 years later Evidence-based nursing. 2014 Jun;17(2):59-60 [Accessed 17 Jun 2021]
[3] Holt-Lunstad J, Smith TB, Baker M and others (2015) Loneliness and social isolation as risk factors for mortality: a meta-analytic review Perspect Psychol Sci. 2015 Mar;10(2):227-37 [Accessed 16 Jun 2021]
[4] McLaughlin D, Vagenas D, Pachana NA, and others (2010) Gender Differences in Social Network Size and Satisfaction in Adults in Their 70s Journal of Health Psychology. 2010;15(5):671-679 [Accessed 10 May 2021]
[5] Davidson S, Rossall P (2015) Loneliness in Later Life Evidence Review London: Age UK [Accessed 17 Jun 2021]
[6] Thornton J (2019) WHO report shows that women outlive men worldwide BMJ 2019 Apr;5:365-1631 [Accessed 17 Jun 2021]
[7] Compton J and Pollak R (2021) The Life Expectancy of Older Couples And Surviving Spouses PLoS ONE 2021;16(5): e0250564 [Accessed 17 Jun 2021]
[8] Cudjoe TKM, Roth DL, Szanton SL, and others (2020) The Epidemiology of Social Isolation: National Health and Aging Trends Study J Gerontol B Psychol Sci Soc Sci 2020 Jan;75(1):107-113 [Accessed 17 Jun 2021]
[9] Crews JE and Campbell VA (2004) Vision Impairment and Hearing Loss Among Community-Dwelling Older Americans: Implications for Health and Functioning Am J Public Health 2004 May; 94(5):823-9 [Accessed 10 May 2021]
[10] Wang SW and Boerner K (2008) Staying connected: re-establishing social relationships following vision loss Clin Rehabil 2008 Sep; 22(9):816-24 [Accessed 10 May 2021]
[11] Leveziel N, Marillet S, Braithwaite T and others (2020) Self-reported visual difficulties in Europe and related factors: a European population-based cross-sectional survey Acta Ophthalmol. 2020 Oct [Accessed 02 Jun 2021]

Developing a better understanding of the association between different measures of visual impairment and social isolation and loneliness will enhance our ability to screen for and act upon social isolation and loneliness risk factors.

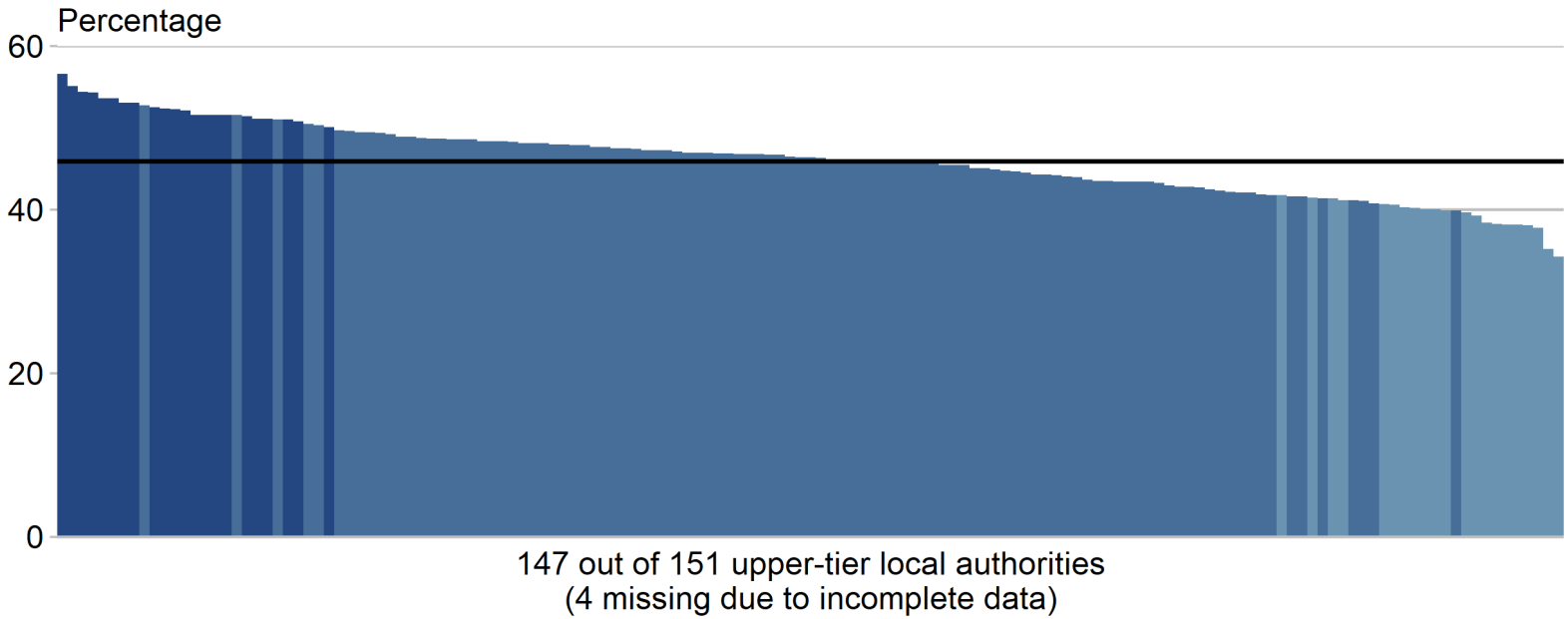
Map 9: Variation in percentage of social care users aged 18 years and over who have as much social contact as they would like by upper-tier local authority (2019/20)

Optimum value: High

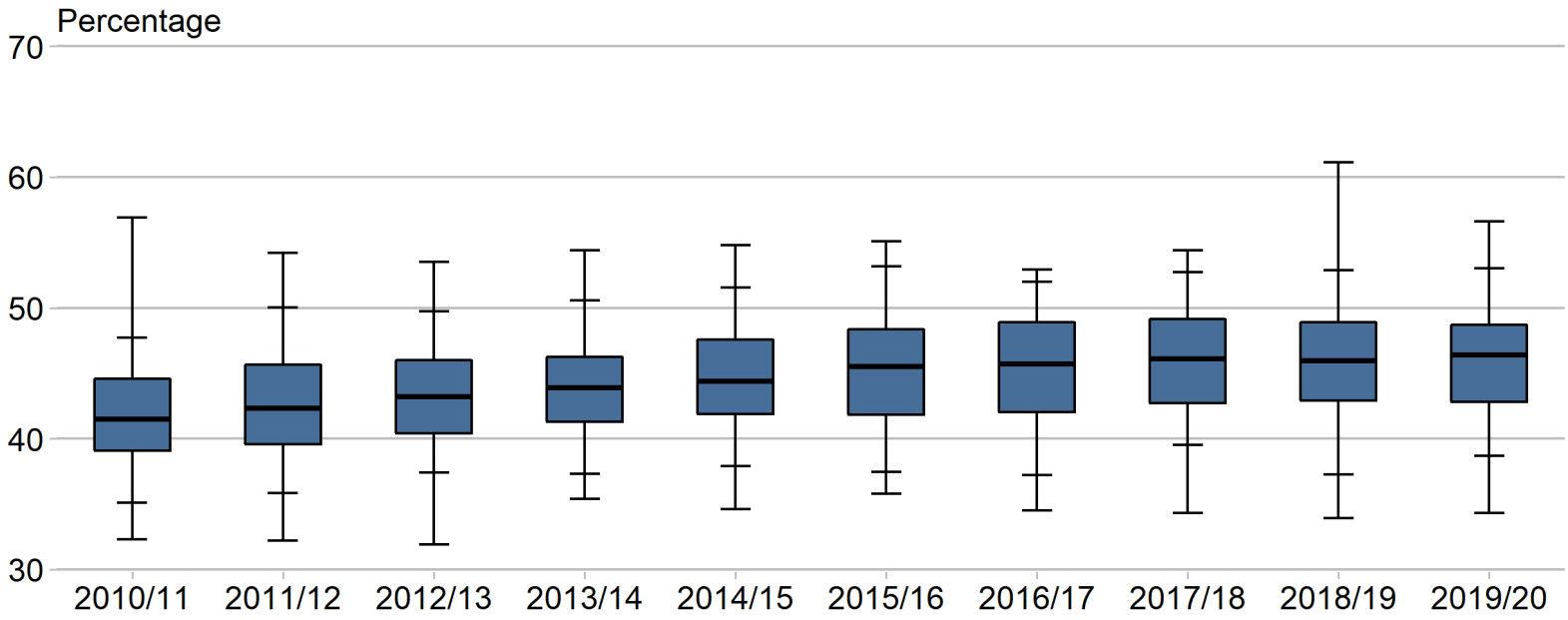




Column chart: Variation in percentage of social care users aged 18 years and over who have as much social contact as they would like by upper-tier local authority (2019/20)



Box plot time series: Variation in percentage of social care users aged 18 years and over who have as much social contact as they would like by upper-tier local authority (2010/11 to 2019/20)



Year	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	
Max-Min (Range)	24.6	22.0	21.6	19.0	20.2	19.3	18.4	20.1	27.2	22.3	No significant change
75th-25th percentile	5.5	6.1	5.6	5.0	5.7	6.5	6.9	6.5	6.0	5.9	No significant change
95th-5th percentile	12.6	14.2	12.3	13.3	13.7	15.7	14.8	13.2	15.6	14.3	No significant change
Median	41.5	42.3	43.2	43.9	44.4	45.5	45.7	46.1	46.0	46.4	INCREASING Significant

Magnitude of Variation

Map 9: Variation in percentage of social care users aged 18 years and over who have as much social contact as they would like by upper-tier local authority

The maps and column chart display the latest period (2019/20), during which upper-tier local authority values ranged from 34.3% to 56.6%, which is a 1.7-fold difference between upper-tier local authorities.

The England value for 2019/20 was 45.9%.

The box plot shows the distribution of upper-tier local authority values for the period 2010/11 to 2019/20.

The median increased significantly from 41.5% in 2010/11 to 46.4% in 2019/20.

It is important to note that this data is related to social care users, as opposed to the general population as a whole. Interpretation is therefore limited.

Variation in social isolation is widely influenced by age, geographical restriction, community resources and poorer health and vision. The majority of these factors are in themselves influenced by socioeconomics, which therefore plays a key role in social isolation. In particular, access to digital resources vary by age and wealth, with older adults being less adept at using the internet and digital inclusion resources. Research highlights that people who do not use the internet have higher rates of feeling isolated.[12]

Options for action

It is important to identify populations at risk of social isolation and ensure integrated community support services can be offered to people most at risk. Education regarding the availability of community resources is paramount for increasing the uptake of such interventions.

The National Institute for Health and Care Excellence (NICE) has published quality standards[13] and guidance[14] on how to identify those at risk of reduced social interaction and the interventions that can be used to overcome social isolation and loneliness in those aged 65 or older.

[12] Age UK (2020) Loneliness and digital inclusion [Accessed 10 May 2021]
[13] National Institute for Health and Care Excellence (2016) Mental wellbeing and independence for older people – Quality statement 3: Social participation (NICE quality standard [QS137]) [Accessed 10 May 2021]
[14] National Institute for Health and Care Excellence (2015) Older people: independence and mental wellbeing (NICE guideline [NG32]) [Accessed 10 May 2021]

Interventions include activities to build social participation such as:

- singing programmes
- creative arts activities
- intergenerational activities such as young people providing older people with support to use new technologies
- tailored community-based physical activity programmes

Having access to the internet and the ability to use digital services can help older adults to stay socially connected. Age UK has developed digital inclusion projects[15,16] that include one-to-one support, classroom-based services and larger community awareness sessions in order to increase the digital capabilities of older adults.

Blind and partially sighted individuals are at much higher risk of social isolation and loneliness than the general population of older adults, as visual impairment may reduce access to social networks, social and functional activities. Modifying existing programmes for individuals with vision impairments and limited social networks is an important consideration.

Recommendations from the Royal National Institute of Blind People (RNIB) for managing social isolation and loneliness risks in blind and partially sighted individuals include:

- early interventions to address the needs of blind or partially sighted individuals
- visual impairment rehabilitation
- community care assessment of eligibility for social care services

Resources

Age UK (2020) Loneliness and digital inclusion [Accessed 10 May 2021]

National Institute for Health and Care Excellence (2016) Mental wellbeing and independence for older people – Quality statement 3: Social participation (NICE quality standard [QS137]) [Accessed 10 May 2021]

National Institute for Health and Care Excellence (2015) Older people: independence and mental wellbeing (NICE guideline [NG32]) [Accessed 10 May 2021]

Royal National Institute of Blind People (2013) Facing blindness alone [Accessed 10 May 2021]

[15] Time to Shine What we've Learned - Digital Angels [Accessed 15 Jun 2021]
[16] Age UK Programmes & innovation One Digital [Accessed 15 Jun 2021]

Falls

Context

Falls are a significant cause of morbidity and mortality in older adults. Falls related injuries and admissions are estimated to cost the NHS more than £2.3 billion per annum.[1] Postural stability and balance are primarily dependent on good visual and vestibular sensory input. Increasing age can result in a decline of these inputs as well as key contributing factors such as proprioception, muscle strength and reaction times.

The increased risk of falls in older adults is thought to be multifactorial. Factors include:

- increasing age
- previous falls
- gait disorder/postural stability
- foot health
- continence
- dependency in activities of daily living
- visual impairment
- hearing impairment
- less social activity outside of the home
- neurological and cardiovascular disease
- medications
- environmental factors

Impairments in any major component of vision, such as visual field, acuity, contrast sensitivity and stereopsis can contribute to increased incidences of falls. Age related macular degeneration (AMD) primarily affects central vision. Symptoms include distortion of lines and difficulty recognising faces. Peripheral vision is relatively unaffected in this disease. Despite this, patients with AMD have a significantly increased risk of falls.[2] Studies exploring the underlying pathology for increased falls risk in patients with AMD suggest that reduced contrast sensitivity in particular was associated with postural instability and gait disturbance.[3] Balance training has shown promising results in reducing falls risk in the general population[4] and has shown improvements in visuomotor function in patients with AMD.[5]

[1] National Institute for Health and Care Excellence (2013) Falls in older people: assessing risk and prevention - Introduction (NICE clinical guideline [CG161]) [Accessed 11 May 2021]
[2] Szabo SM, Janssen PA, Khan K and others (2008) Older Women with Age-Related Macular Degeneration Have a Greater Risk of Falls: A Physiological Profile Assessment Study J Am Geriatr Soc. 2008; 56: 800–807 [Accessed 11 May 2021]
[3] Wood JM, Lacherez PF, Black AA and others (2009) Postural stability and gait among older adults with age-related maculopathy Invest Ophthalmol Vis Sci. 2009; 50: 482–487 [Accessed 02 Jun 2021]
[4] Gillespie LD, Robertson MC, Gillespie WJ and others (2012) Interventions for preventing falls in elderly people Cochrane Database Syst Rev. 2012 Sep;2012(9) [Accessed 02 Jun 2021]
[5] Radvay X, Duhoux S, Koenig-Supiot F and others (2007) Balance training and visual rehabilitation of age-related macular degeneration patients J Vestib Res. 2007; 17: 183–193 [Accessed 11 May 2021]

Glaucoma causes visual field losses, which are a well established cause of falls. Visual field loss diminishes visual input, with the consequence of decreased postural stability and increased risk of colliding with objects obstructed from the patients field of view. However, even patients with mild field defects were shown to be more than three times more likely to have fallen over a 1 year period.[6]

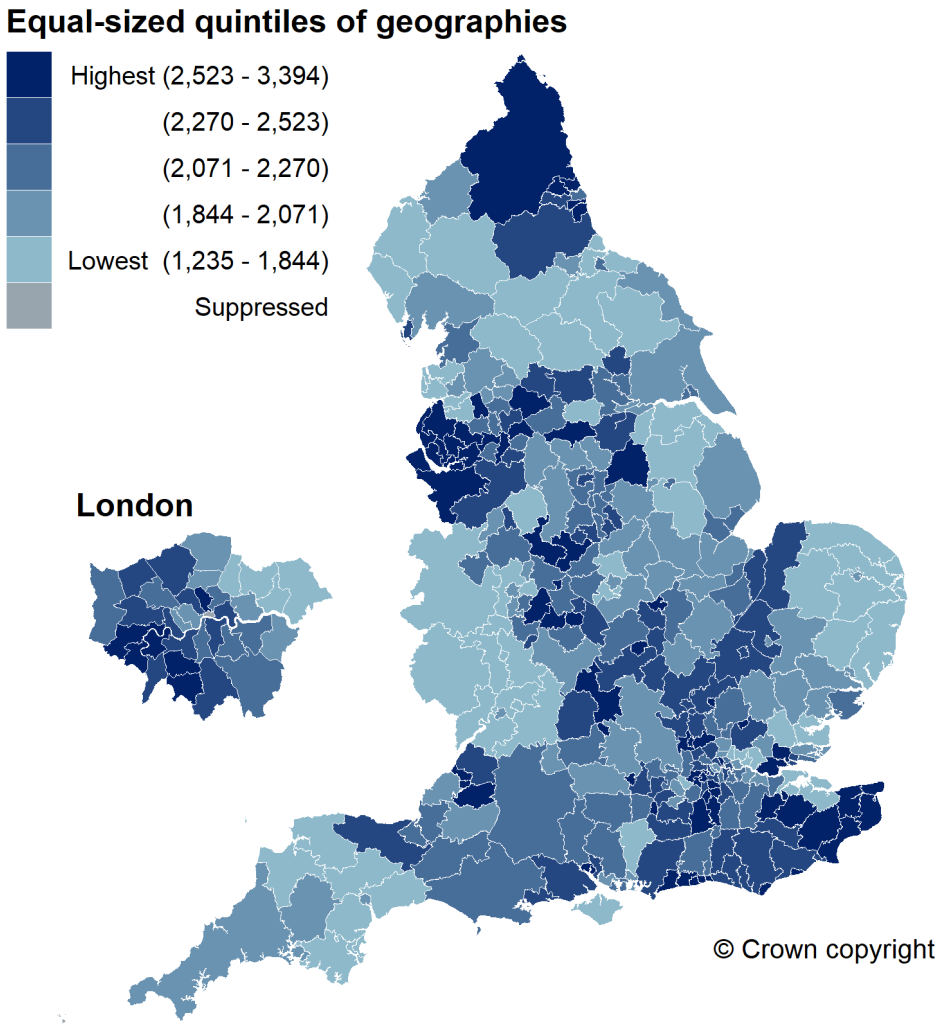
Cataracts are the commonest reversible cause of visual impairment in the elderly.[7] Cataract surgery has been shown to reduce the risk of falls.[8] Additionally, patients who wait more than 6 months for cataract surgery may experience an increased rate of falls and a reduced quality of life during the waiting period.[9]

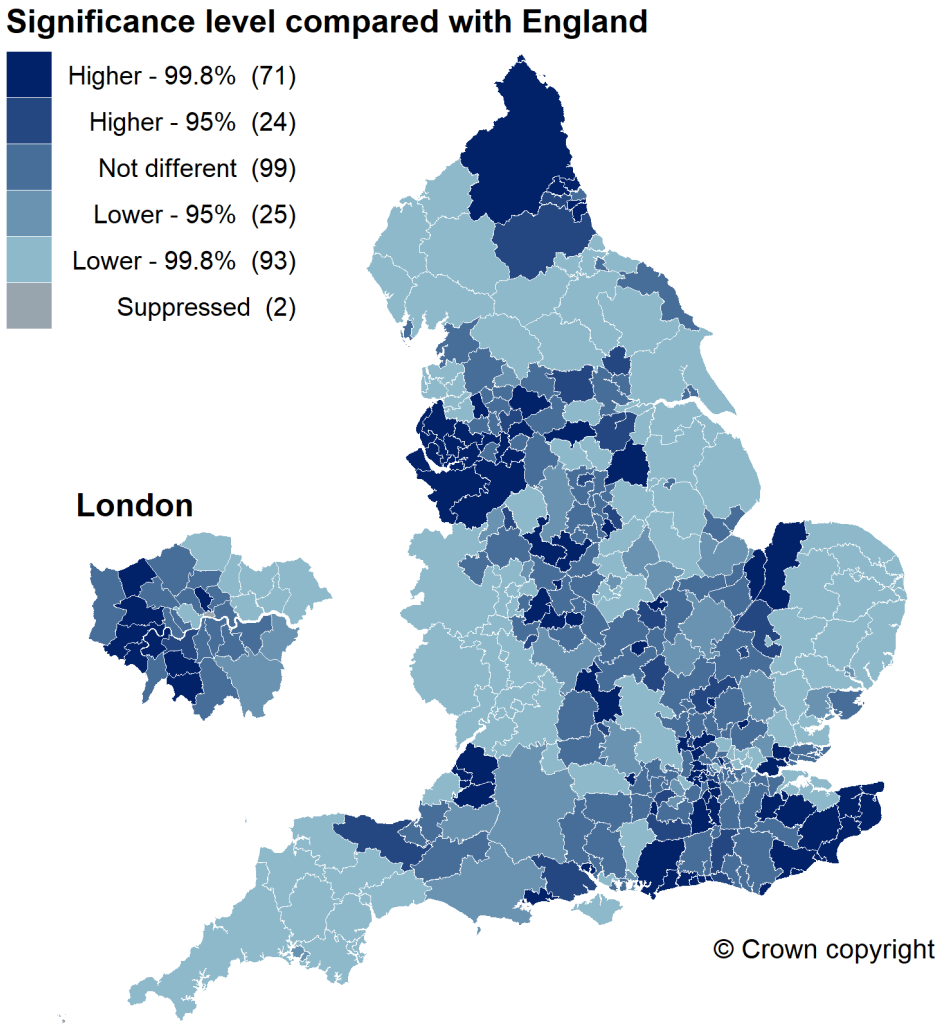
The relationship between falls and visual impairment is well established. Identifying patients with visual impairment and eye diseases who are at risk of falls, and developing appropriate interventions to mitigate these risks, is essential in mitigating the social and economic impact of falls. Similarly, for patients who have fallen, checking their vision is an important part of a comprehensive health examination. This is increasingly important in older adults where many causes of visual impairment are reversible. Older adults who take part in regular physical activity experience less falls when wearing single vision glasses than less active groups wearing single vision glasses.[10,11] Wearers of bifocals and progressive addition lens were twice as likely to fall and are at higher risk of 'edge of step' accidents compared to single vision lens wearers.[10]

[6] Haymes SA, Leblanc RP, Nicolela MT and others (2007) Risk of falls and motor vehicle collisions in glaucoma Invest Ophthalmol Vis Sci. 2007; 48:1149–1155 [Accessed 11 May 2021]
[7] Vision Loss Expert Group of the Global Burden of Disease Study (2020) Causes of blindness and vision impairment in 2020 and trends over 30 years, and prevalence of avoidable blindness in relation to VISION 2020: the Right to Sight: an analysis for the Global Burden of Disease Study The Lancet Global health, 9 (2021), pp. e144-e160 [Accessed 24 Jun 2021]
[8] Harwood RH, Foss AJ, Osborn F and others (2005) Falls and health status in elderly women following first eye cataract surgery: a randomised controlled trial Br J Ophthalmol. 2005;89:53–59 [Accessed 11 May 2021]
[9] Hodge W, Horsley T, Albiani D and others (2007) The consequences of waiting for cataract surgery: A systematic review CMAJ. 2007;176:1285–1290 [Accessed 11 May 2021]
[10] College of optometrists (2020) Vision and falls - The importance of vision in preventing falls [Accessed 22 Jun 2021]
[11] Haran MJ, Cameron ID, Ivers RQ and others (2010) Effect on falls of providing single lens distance vision glasses to multifocal glasses wearers: VISIBLE randomised controlled trial. BMJ. 2010 May 25;340:c2265. [Accessed 22 Jun 2021]

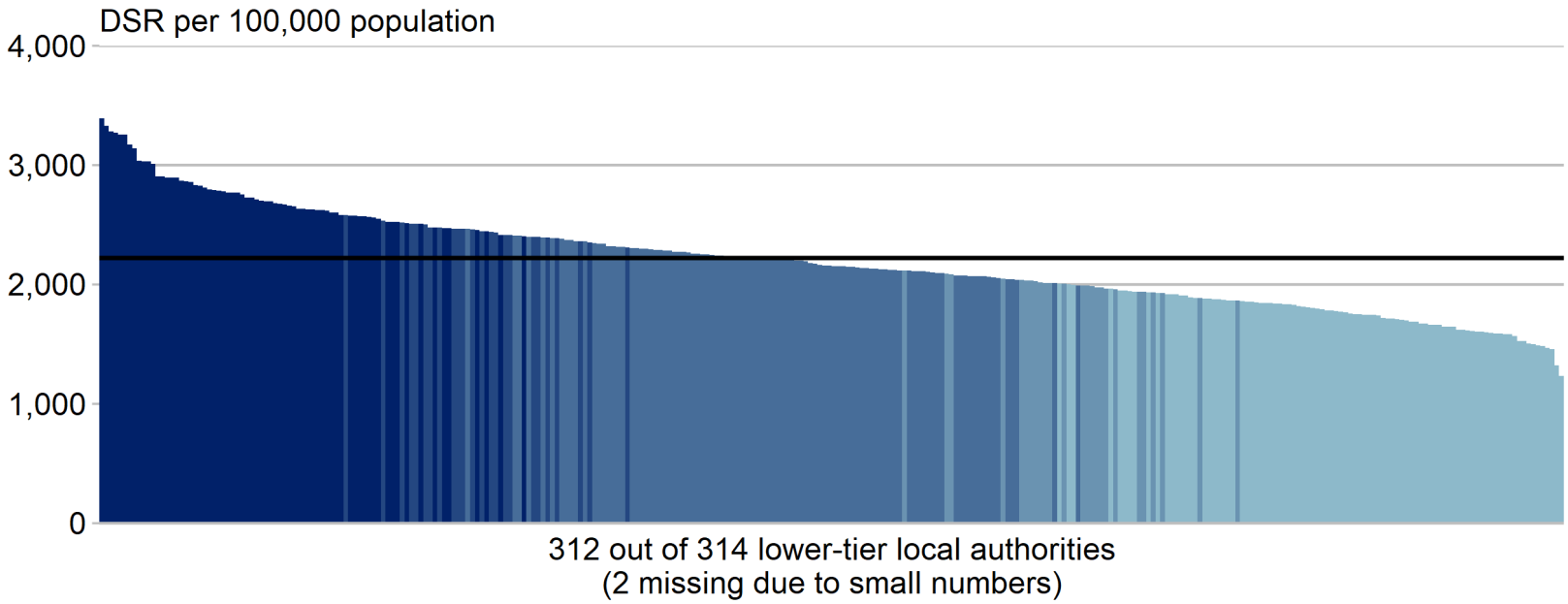
Map 10: Variation in rate of emergency admissions to hospital due to falls in people aged 65 years and over by lower-tier local authority (2019/20)

Directly standardised rate per 100,000 population
Optimum Value: Low

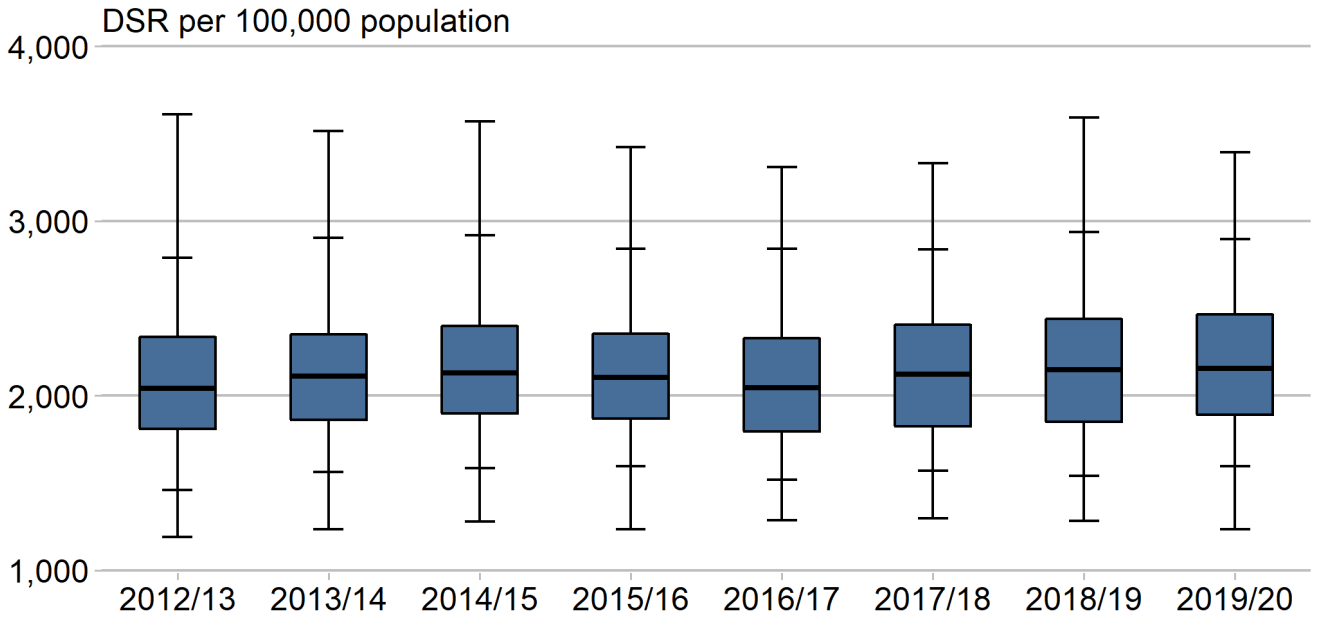




Column chart: Variation in rate of emergency admissions to hospital due to falls in people aged 65 years and over by lower-tier local authority (2019/20)



Box plot time series: Variation in rate of emergency admissions to hospital due to falls in people aged 65 years and over by lower-tier local authority (2012/13 to 2019/20)



Year	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	
Max-Min (Range)	2,420	2,282	2,289	2,186	2,022	2,031	2,307	2,159	No significant change
75th-25th percentile	526	490	501	487	534	582	587	577	WIDENING Significant
95th-5th percentile	1,332	1,343	1,332	1,247	1,323	1,266	1,397	1,297	No significant change
Median	2,042	2,113	2,129	2,106	2,045	2,122	2,150	2,156	No significant change

Magnitude of Variation

Map 10: Variation in rate of emergency admissions to hospital due to falls in people aged 65 years and over by lower-tier local authority

The maps and column chart display the latest period (2019/20), during which lower-tier local authority values ranged from 1,235 per 100,000 population to 3,394 per 100,000 population, which is a 2.7-fold difference between lower-tier local authorities.

The England value for 2019/20 was 2,222 per 100,000 population.

The box plot shows the distribution of lower-tier local authority values for the period 2012/13 to 2019/20.

The 75th to 25th percentile gap widened significantly.

Low vision is an important contributory factor to increased falls risk but it is only one part of a multifactorial problem. Variation in the rate of emergency admissions to hospital due to falls is associated with the age of the local population, socioeconomic factors and access to healthcare services.

Options for action

Preventing falls requires a multifactorial approach. National Institute for Health and Care Excellence (NICE) clinical guidance [CG161] recommends multifactorial risk assessments including a comprehensive falls history with an assessment of risk factors, comorbidities and occupational hazards alongside medical examination and medication review.[1]

Given the multifactorial nature of falls in older adults, there are multiple targeted programmes aimed at tackling the variety of risk factors predisposing individuals to increased rates of falls.[12] In terms of return on investment, exercise and home hazard assessments are cost-effective measures for prevention.[13] Identifying factors that contribute to increased falls risk are essential for improving targeted schemes within a local authority.

Additionally, identifying patients that are at a higher risk of falls is essential to ensure all patients have access to available treatments. People registered as blind or partially sighted are known to their local authority social services. They represent a readily identifiable group of people at higher risk who could be prioritised for interventions.

[12] Public Health England (2017) Falls and fractures: consensus statement and resources pack [Accessed 22 Jun 2021]
[13] Public Health England (2018) Falls prevention: cost-effective commissioning [Accessed 22 Jun 2021]

Further details can be found in the Blind and partially sighted registrations section. To identify people who may be living with frailty, NICE recommends the use of a validated electronic Frailty Index (eFI) tool.[14] However, whilst the uptake of such tools in primary care is high and referrals are being made for high-risk individuals to strength and balance training programmes, uptake or adherence to these programmes are low.[14,15] A lack of awareness of the links between falls and insufficient exercise, poor strength or balance may be a factor for low observance.[16] Programmes that are done in group settings or as one to one sessions can help with engagement except where the patient has multiple sensory impairments.[17] Work must be undertaken to understand the reasons for low uptake and remove potential barriers for such interventions.

NICE has produced comprehensive guidelines in the prevention and management of falls. Some of the key components include:

- identification of people at risk
- multifactorial falls risk assessment and interventions
- multifactorial interventions:
    - referral for strength and balance training programmes
    - home hazard assessment and intervention
    - vision assessment and referral
    - medication review
- detecting and managing osteoporosis and fracture risk
- optimal support after a fragility fracture to prevent recurrent falls

Vision assessment and referral is a component of a successful multifactorial falls prevention programme. The Royal College of Physicians published the National Audit of Inpatient Falls which revealed that less than 50% of inpatients receive a vision assessment.[18,19] There is little evidence available about the proportion of vision assessments as part of the fall prevention programme in community settings. Increasing awareness and access to free NHS eye health checks,[20] including the option of using mobile sight tests, for early identification of visual problems may also help to prevent rates of falls in older adults.

[14] National Institute for Health and Care Excellence (2018) NICEimpact falls and fragility fractures [Accessed 22 Jun 2021]
[15] Waterman H, Ballinger C, Brundle C and others (2016) A feasibility study to prevent falls in older people who are sight impaired: the VIP2UK randomised controlled trial. Trials. 2016 Sep 26;17(1):464 [Accessed 23 Jun 2021] [Accessed 23 Jun 2021]
[16] Brundle C, Waterman HA, Ballinger C and others (2015) The causes of falls: views of older people with visual impairment. Health Expect. 2015 Dec;18(6):2021-31. [Accessed 23 Jun 2021]
[17] Adams N, Skelton DA, Howel D and others (2018) Feasibility of trial procedures for a randomised controlled trial of a community based group exercise intervention for falls prevention for visually impaired older people: the VIOLET study. BMC Geriatr. 2018 Dec 12;18(1):307 [Accessed 23 Jun 2021]
[18] Royal college of Physicians (2000) National Audit of Inpatient Falls (NAIF) [Accessed 23 Jun 2021]
[19] Royal college of Physicians (2017) Bedside vision check for falls prevention: assessment tool [Accessed 23 Jun 2021]
[20] NHS (2021) Free NHS eye tests and optical vouchers [Accessed 23 Jun 2021]

Resources

College of Optometrists (2021) Vision and falls [Accessed 23 Jun 2021]

College of Optometrists (2021) Eye care - a guide to looking after your eyes - Falls prevention [Accessed 23 Jun 2021]

National Institute for Health and Care Excellence (2013) Falls in older people: assessing risk and prevention (NICE clinical guideline [CG161]) [Accessed 11 May 2021]

National Institute for Health and Care Excellence (2018) Measuring the use of NICE guidance: NICEimpact falls and fragility fractures [Accessed 11 May 2021]

National Institute for Health and Care Excellence (2015) Medicines optimisation: the safe and effective use of medicines to enable the best possible outcomes (NICE guideline [NG5]) [Accessed 11 May 2021]

National Institute for Health and Care Excellence (2017) Preventing falls in older people (NICE interactive flowchart) [Accessed 11 May 2021]

National Institute for Health Research (NIHR) Applied Research Collaboration East Midlands (2019) Falls Management Exercise (FaME) Implementation Toolkit [Accessed 11 May 2021]

NHS Health Education England in partnership with the Royal College of Physicians (2021) Preventing falls in hospitals (Interactive e-learning resource) [Accessed 12 Aug 2021]

NHS England (2017) NHS RightCare Pathways: Falls and Fragility Fractures Pathway [Accessed 11 May 2021]

Public Health England (2017) Falls and fractures: consensus statement and resources pack [Accessed 22 Jul 2021]

Diabetes

Context

Diabetic retinopathy (DR) is a common complication of diabetes mellitus and a significant cause of visual loss on a global scale. The prevalence of diabetes mellitus (diagnosed and undiagnosed) is increasing worldwide with estimates for England for 2020 standing at 4.2 million people aged 16 and over living with the condition.[1]

Diabetes is a progressive disease that leads to a range of microvascular and macrovascular complications. DR is a microvascular complication that arises due to damage to the blood vessels supplying the retina. It was until recently the leading cause of visual loss in working adults,[2,3] making it a significant public health concern. Almost all patients with type 1 diabetes, and 60% of people with type 2 diabetes, have some degree of retinopathy 20 years after diagnosis.[4]

A range of demographic risk factors have been identified for the development and progression of diabetes and DR.[5] In the UK, South Asian and African Caribbean communities are approximately two times more likely to develop diabetes mellitus than white British populations.[6, 7, 8] Poor socioeconomic status has also been shown to be associated with diabetic retinopathy.[9]

A national screening programme was introduced in England in 2003[10] in order to prevent, delay and better manage DR. Further details about the screening programme, including clinical grading and the management of patients can be found in the Diabetic eye screening section.

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[1] Public Health England (2015) Diabetes prevalence model - Diabetes prevalence estimates for CCGs by GP registered populations [Accessed 13 Jun 2021]

[2] Mathur R, Bhaskaran K, Edwards E and others (2017) Population trends in the 10-year incidence and prevalence of diabetic retinopathy in the UK: a cohort study in the Clinical Practice Research Datalink 2004–2014. BMJ Open 2017;7:e014444 [Accessed 22 Jul 2021]

[3] Rahman F, Zekite A, Bunce C and others (2020) Recent trends in vision impairment certifications in England and Wales. Eye 34, 1271–1278 [Accessed 13 Jun 2021]

[4] Diabetes UK (2010) Diabetes in the UK 2010: Key statistics on diabetes 2010

[5] Gupta R, Misra A (2016) Epidemiology of microvascular complications of diabetes in South Asians and comparison with other ethnicities J Diabetes 2016;**8**:470–82 [Accessed 13 Jun 2021]

[6] Bhopal RS (2013) A four-stage model explaining the higher risk of type 2 diabetes mellitus in South Asians compared with European populations Diabet Med 2013;**30**:35–42 [Accessed 13 Jun 2021]

[7] Davis TME (2008) Ethnic diversity in type 2 diabetes Diabet Med2008;**25**(Suppl 2):52–6 [Accessed 13 Jun 2021]

[8] Pham TM, Carpenter JR, Morris TP and others (2019) Ethnic Differences in the Prevalence of Type 2 Diabetes Diagnoses in the UK: Cross-Sectional Analysis of the Health Improvement Network Primary Care Database. Clin Epidemiol. 2019;11:1081-1088 [Accessed 16 Jun 2021]

[9] Low L, Law JP, Hodson J and others (2015) Impact of socioeconomic deprivation on the development of diabetic retinopathy: a population-based, cross-sectional and longitudinal study over 12 years BMJ Open 2015;5:e007290 [Accessed 22 Jul 2021]

[10] Scanlon PH (2017) The English National Screening Programme for diabetic retinopathy 2003-2016. Acta Diabetol. 2017;54(6):515-525 [Accessed 16 Jan 2021]

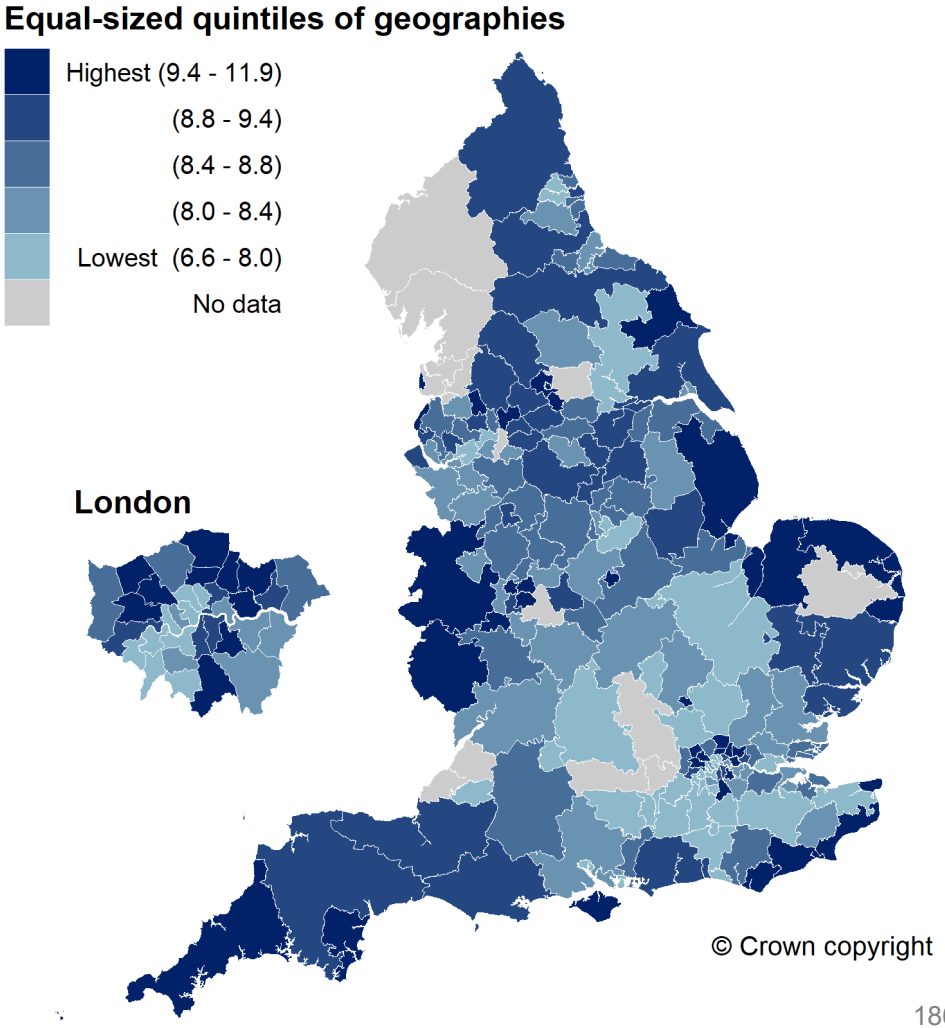
Despite improvements in screening for diabetic retinopathy and advancements in treatment options (such as anti-VEGF for diabetic macular oedema), DR continues to bear a considerable public health burden. Visual impairment from DR can result in reduced physical, emotional and social well-being[11] and has a significant impact on health-related quality of life.

Establishing a more complete understanding of the disease burden in the diverse UK population will help to improve future interventions in service planning, preventative and therapeutic care.

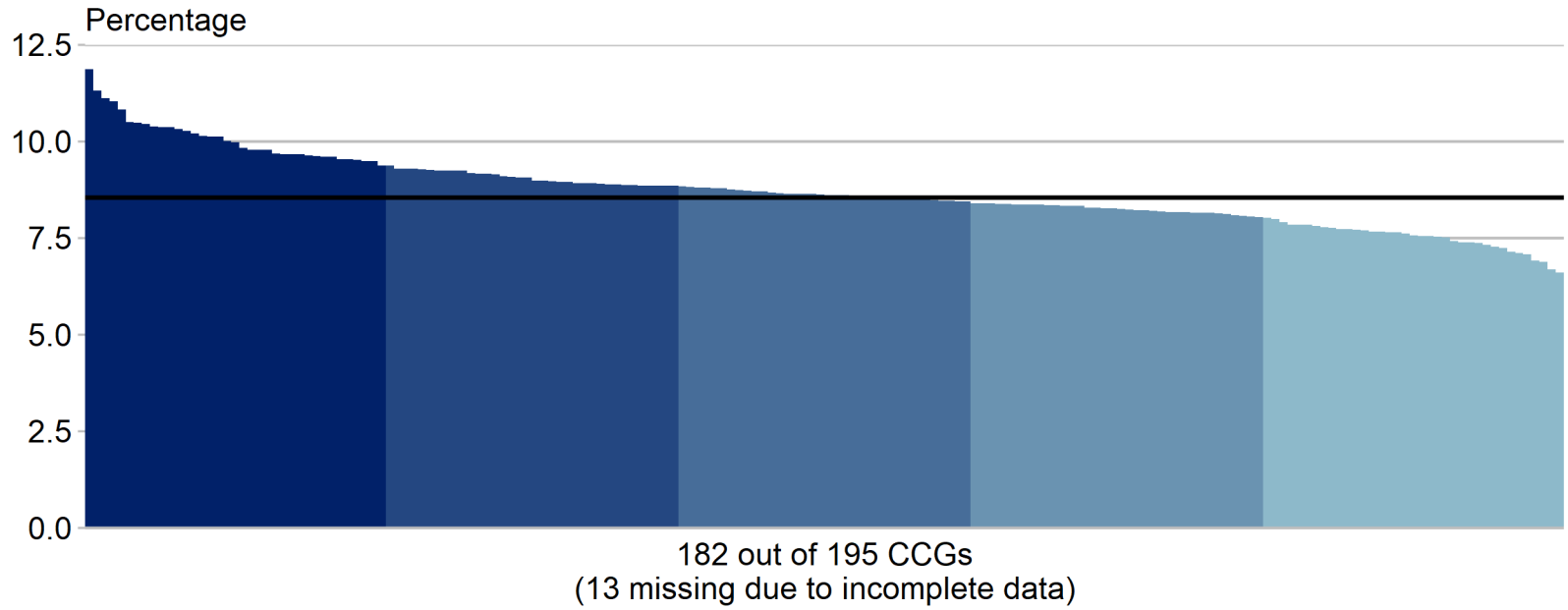
[11] Fenwick EK, Pesudovs K, Rees G, and others (2011) The impact of diabetic retinopathy: understanding the patient's perspective Br J Ophthalmol. 2011 Jun;95(6):774-82 [Accessed 16 Jun 2021]

Map 11: Variation in percentage of people aged 16 years and over who have diabetes (estimated prevalence - undiagnosed and diagnosed) by clinical commissioning group (2017)

Optimum value: Low



Column chart: Variation in percentage of people aged 16 years and over who have diabetes (estimated prevalence - undiagnosed and diagnosed) by CCG (2017)



Magnitude of Variation

Map 11: Variation in percentage of people aged 16 years and over who have diabetes (estimated prevalence - undiagnosed and diagnosed) by clinical commissioning group

The map displays the latest period (2017), during which clinical commissioning group (CCG) values ranged from 6.6% to 11.9%, which is a 1.8-fold difference between CCGs.

The England value for 2017 was 8.5%.

The differences between CCGs may be influenced by many factors such as age structure, ethnicity, obesity and socioeconomic status.

Excess weight and diet are also important factors that influence the prevalence of diabetes across England. Numerous areas in the highest quintiles for percentage of people classified as overweight and obese are also in the highest quintiles for diabetes prevalence.

Additionally, access to healthcare may be a key factor that influences both early diagnosis and effective management of diabetes to prevent adverse outcomes.

Options for action

The key to reducing the prevalence of diabetes and importantly the associated adverse outcomes lies in early prevention, education and awareness.

Raising awareness of the risk factors for diabetes will help to promote routine health checks and lifestyle changes. Identifying people at risk in order to prevent or delay diabetes by encouraging changes to their diet and lifestyle is the focus of the NHS Diabetes Prevention Programme. The programme helps to introduce lifestyle interventions at a pre-diabetic stage and reduce the risk of developing type 2 diabetes.

Referral routes into the diabetes prevention programme vary according to local case finding pathways. Three primary mechanisms for referral are: the NHS Health Check Programme; those who have already been identified as having an appropriately elevated risk level (HbA1c or FPG) in the past and who have been included on a register of patients with high HbA1c or FPG; and those who are identified with nondiabetic hyperglycaemia (NDH) as part of routine clinical care.[12]

[12] Public Health England (2018) Health matters: preventing Type 2 Diabetes [Accessed 22 Jul 2021]

Education on the impacts of diabetes will help to encourage adherence to national screening programmes that are in place. Alongside personalised care planning, education can also empower patients to self-manage their diabetes more effectively and take a more proactive role in their care.

Additionally, recognising at-risk groups such as ethnic minority groups and developing culturally appropriate programmes is paramount. Certain ethnic minorities such as South Asian, African Caribbean or black African are 2 to 4 times more likely to develop type 2 diabetes.[13] NICE has specific guidance that recognises this increased risk and extends the usual recommendation of conducting a diabetic risk assessment in anyone over the age of 40 to people aged 25 to 39 in high risk minority ethnic groups. NICE guidance also promotes a healthy diet and physical activity and has recommendations on how to tailor services for minority ethnic communities and other at-risk groups.

Importantly, ensuring NICE guidance is followed at all tiers of healthcare will help to prevent the onset of complications such as diabetic retinopathy.

Resources

For further information about diabetic eye screening please refer to the Diabetic eye screening chapter of this publication.

Diabetes UK (2021) Resources to improve care [Accessed 18 Jun 2021]

National Institute for Health and Care Excellence (2018) NICEimpact: diabetes [Accessed 18 Jun 2021]

National Institute for Health and Care Excellence (2011) Type 2 diabetes prevention: population and community-level interventions (Public health guidance [PH35]) [Accessed 18 Jun 2021]

National Institute for Health and Care Excellence (2012) Type 2 diabetes: prevention in people at high risk Last updated: 15 September 2019 (Public health guidance [PH38]) [Accessed 18 Jun 2021]

National Institute for Health and Care Excellence (2018) Promoting health and preventing premature mortality in black, Asian and other minority ethnic groups (Quality standards [QS167]) [Accessed 18 Jun 2021]

[13] Cultural intelligence Hub (2020) A handbook for communicating with black and south Asian communities about Type 2 diabetes [Accessed 21 Jul 2021]

NHS Diabetes Prevention Programme (2021) [Accessed 18 Jun 2021]

NHS Health Check (2021) [Accessed 22 Jul 2021]

Public Health England Diabetes [Accessed 21 Jul 2021]

Public Health England Health matters: preventing Type 2 Diabetes [Accessed 21 Jul 2021]

Excess Weight

Context

Obesity is a significant public health concern with increasing prevalence in the UK. The majority of adults in England were overweight or obese in 2018 (63%) with 28% classified as being obese.[1] The World Health Organization (WHO) define obesity as a body mass index (BMI) of over 30. A BMI of 25 to 29.9 is classified as overweight.[2] Additionally, waist size can be used as a measure of obesity. A waist size greater than 94cm in men and greater than 80cm in women poses a higher risk of developing obesity related health problems.[3]

The medical consequences of obesity are well documented. It is associated with numerous comorbidities, most commonly:

- coronary heart disease
- type 2 diabetes mellitus
- hypertension
- stroke
- obstructive sleep apnoea
- certain cancers
- non-alcoholic fatty liver disease

Though less documented, obesity also has numerous consequences related to ocular health and vision. In particular, obesity has been shown to be associated with cataracts, age related macular degeneration (AMD), diabetic retinopathy and glaucoma.[4]

Obesity is associated with development of cataracts. A systematic review and meta-analysis of longitudinal studies showed that both obesity and being overweight were associated with an increased risk of different types of cataract.[5] The relationship between obesity and cataracts may be due to mutual mechanisms such as increased oxidative stress and systemic inflammation, or co-existing risk factors such as diabetes.

There is an established association between obesity and raised intraocular pressure, a strong risk factor for glaucoma. However, few studies have looked at the association with glaucomatous optic neuropathy.

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1 NHS Digital (2020) Statistics on Obesity, Physical Activity and Diet, England, 2020 Part 3: Adult overweight and obesity [Accessed 10 Jun 2021]
2 World Health Organization Health topics: Obesity [Accessed 10 Jun 2021]
3 NHS (2019) Conditions: Obesity [Accessed 10 Jun 2021]
4 Cheung N, Wong TY (2007) Obesity and eye diseases Surv Ophthalmol. 2007 Mar-Apr;52(2):180-95 [Accessed 24 Jun 2021]
5 Pan CW, Lin Y (2014) Overweight, obesity, and age-related cataract: a meta-analysis Optom Vis Sci. 2014 May;91(5):478-83 [Accessed 10 Jun 2021]

There is literature supporting the association between obesity and AMD.[4] Obesity promotes a pro-inflammatory state with increased oxidative stress. Alongside modulation in lipoprotein profiles, these changes are thought to indirectly relate to the pathophysiology behind AMD.[6]

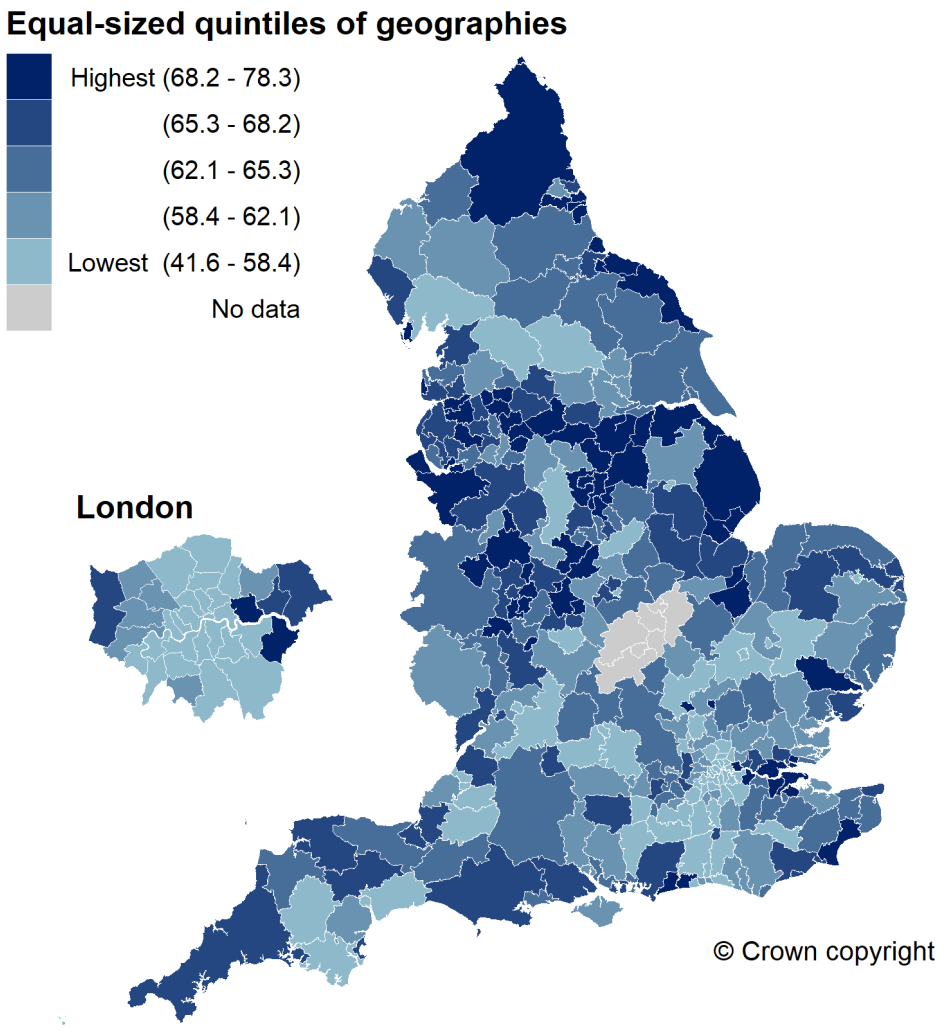
Obesity is a known cause of obstructive sleep apnoea, which has been linked to papilledema[7] and floppy eyelid syndrome.[8] Additionally, obese individuals have a 4-fold increased risk of retinal vein occlusion.[9]

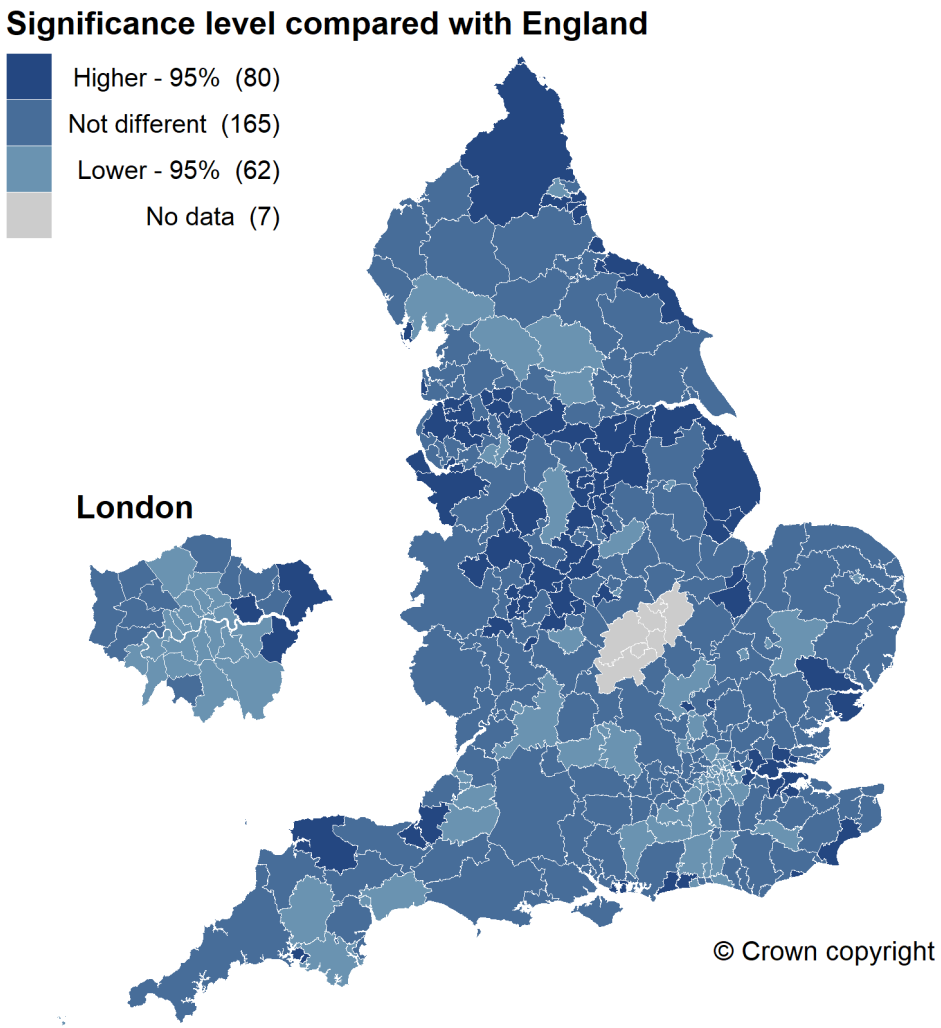
The cost of obesity related morbidity to the NHS in the UK was estimated to be £6.1 billion in 2014/15.[10] The rising financial cost, alongside the vast health burden to individuals, makes obesity an important public health challenge. Importantly, obesity is reversible and preventable, and therefore a priority area for intervention to prevent adverse general and eye health outcomes.

[6] Johnson E (2005) Obesity, Lutein Metabolism, and Age-Related Macular Degeneration: a Web of Connections Nutrition Reviews. 2005 Feb;63(1):9-15 [Accessed 10 Jun 2021]
[7] Purvin VA, Kawasaki A, Yee RD (2000) Papilledema and obstructive sleep apnea syndrome Arch Ophthalmol. 2000 Dec;118(2):1626–1630 [Accessed 10 Jun 2021]
[8] McNab AA (2005) The eye and sleep Clin Experiment Ophthalmol. 2005 Apr;33(2):117–125 [Accessed 10 Jun 2021]
[9] Wong TY, Larsen EK, Klein R and others Cardiovascular risk factors for retinal vein occlusion and arteriolar emboli: the Atherosclerosis Risk in Communities & Cardiovascular Health studies Ophthalmology. 2005 Apr;112(4):540–547 [Accessed 10 Jun 2021]
[10] Scarborough P, Bhatnagar P, Wickramasinghe KK and others (2011) The economic burden of ill health due to diet, physical inactivity, smoking, alcohol and obesity in the UK: an update to 2006-07 NHS costs J Public Health (Oxf). 2011 Dec;33(4):527-35 [Accessed 24 Jun 2021]

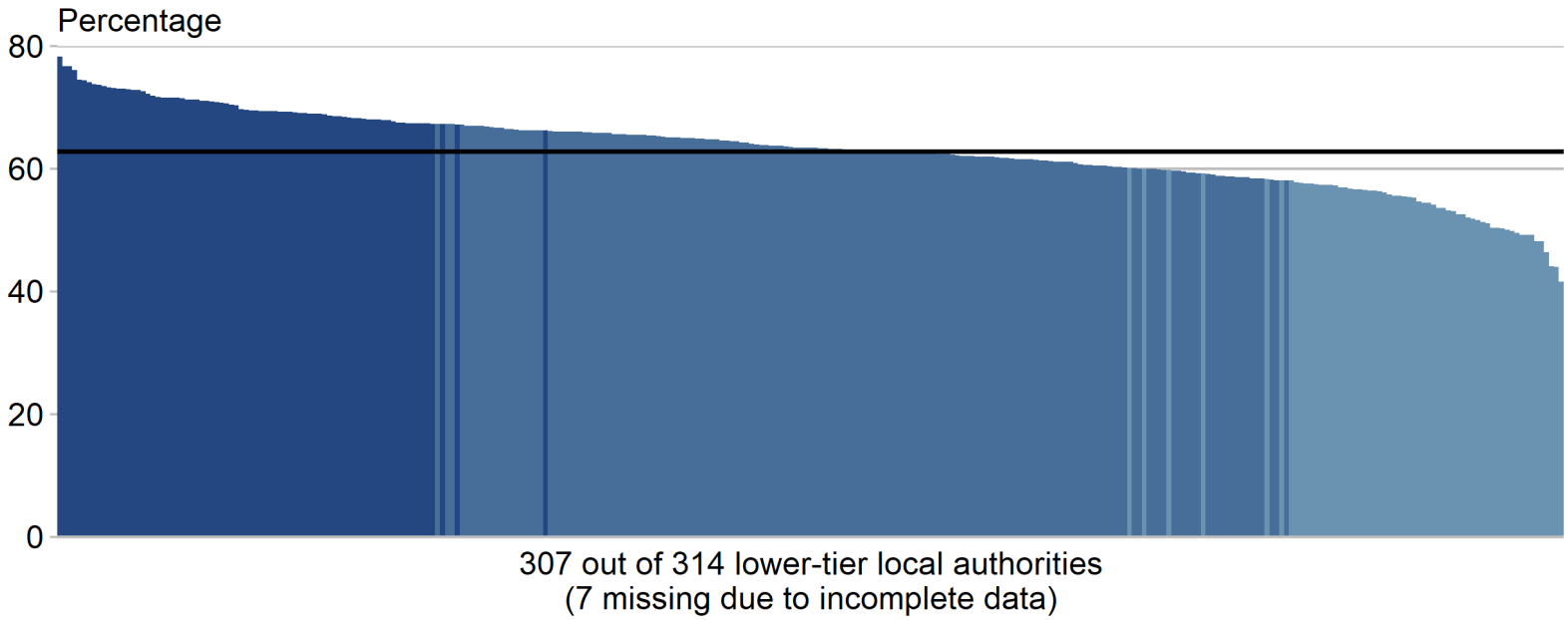
Map 12: Variation in percentage of people aged 18 years and over classified as overweight or obese (body mass index greater than or equal to 25 kg/m2) by lower-tier local authority (2019/20)

Optimum value: Low

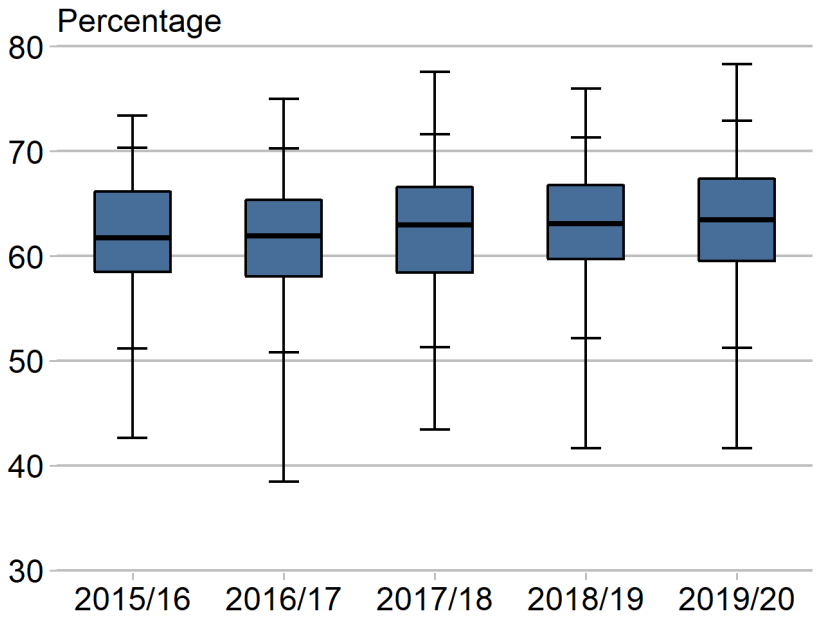




Column chart: Variation in percentage of people aged 18 years and over classified as overweight or obese (body mass index greater than or equal to 25 kg/m2) by lower-tier local authority (2019/20)



Box plot time series: Variation in percentage of people aged 18 years and over classified as overweight or obese (body mass index greater than or equal to 25 kg/m2) by lower-tier local authority (2015/16 to 2019/20)



Year	2015/16	2016/17	2017/18	2018/19	2019/20	
Max-Min (Range)	30.7	36.5	34.1	34.3	36.6	No significant change
75th-25th percentile	7.7	7.3	8.2	7.0	7.9	No significant change
95th-5th percentile	19.1	19.5	20.3	19.2	21.7	No significant change
Median	61.7	61.9	62.9	63.1	63.5	INCREASING Significant

Magnitude of Variation

Map 12: Variation in percentage of people aged 18 years and over classified as overweight or obese (body mass index greater than or equal to 25 kg/m2) by lower-tier local authority

The maps and column chart display the latest period (2019/20), during which lower-tier local authority values ranged from 41.6% to 78.3%, which is a 1.9-fold difference between lower-tier local authorities.

The England value for 2019/20 was 62.8%.

The box plot shows the distribution of lower-tier local authority values for the period 2015/16 to 2019/20.

The median increased significantly from 61.7% in 2015/16 to 63.5% in 2019/20.

It is important to recognise that the prevalence of obesity is high in all local authorities, with the lowest category in Map 12 (equal-sized quintiles of geographies) denoting 41.6% to 58.4% prevalence. Additionally, there have been no significant improvements in recent years nationally, as shown in the box plot.

Obesity is strongly linked to wider determinants of health. In particular, socioeconomic status and the environment where people live strongly influences their risk of obesity.[11] People's diets and exercise (which often comes at a cost) and access to services are also influenced by their environment. Obesity increases with age and some ethnic minority groups such as Black ethnic groups have a higher prevalence of obesity than other ethnic groups.[12]

Area deprivation is a risk factor for both obesity and eye diseases. It is associated with poorer access to open spaces which limits options for physical activity and further exacerbates risk.

Options for action

It is important to work with local authorities in order to address wider determinants of health that impact the prevalence of obesity. A better understanding of local drivers of obesity through community engagement will enable tailored plans of action. A range of resources and programmes have been developed to support local areas to promote a healthier weight in their communities including:

[11] Government Office for Science (2007) Reducing obesity: environmental factors Tackling obesities: future choices: obesogenic environments - evidence review [Accessed 22 Jul 2021]
[12] UK Government (2021) Overweight adults [Accessed 22 Jul 2021]

- a whole systems approach to obesity: a guide to support local approaches to promoting a healthy weight[13]
- promoting healthy weight in children, young people and families: resource to support local authorities[14]
- the Childhood Obesity Trailblazer programme which is testing local levers to tackle childhood obesity at a local level[15]

Education at an early stage about the possible dangers of obesity and how to lead a healthy lifestyle is of particular importance and has to be conducted sensitively. On a national level, government measures include measures around advertising, promotions (volume and location), labelling (out of home calorie labelling, alcohol calorie labelling),[16] and structural and other levers to impact obesity across the life course such as:

- the soft drinks industry levy
- working with businesses across all sectors of the food industry (retailers, manufacturers and the eating out/takeaway delivery sector) to reduce the sugar and calorie content of everyday foods and supporting innovation to help make food and drink products healthier
- promoting a healthy balanced diet through communication channels including; PHE social marketing campaigns (Change4Life,[17] Better Health[18]), PHE's healthier catering guidance[19] and dietary advice via the NHS.uk website[20]
- increasing weight management services for adults and children delivered through the NHS and local authorities
- providing support with the cost of healthy food for those in most need
- encouraging physical activity at school and helping schools to identify gaps in the existing opportunities for children to be active

Resources

Department of Health and Social Care (2020) Tackling obesity: empowering adults and children to live healthier lives [Accessed 22 Jul 2021]

[13] Public Health England (2019) Whole systems approach to obesity Whole systems approach to obesity: a guide to support local approaches to promoting a healthy weight [Accessed 22 Jul 2021]
[14] Public Health England (2018) Promoting healthy weight in children, young people and families Promoting healthy weight in children, young people and families: resource to support local authorities [Accessed 22 Jul 2021]
[15] Local Government Association Childhood Obesity Trailblazer Programme [Accessed 24 Jun 2021]
[16] Department of Health and Social Care (2020) Tackling obesity: empowering adults and children to live healthier lives [Accessed 22 Jul 2021]
[17] NHS Change4life [Accessed 06 Jul 2021]
[18] NHS Better Health [Accessed 06 Jul 2021]
[19] Public Health England (2017) Healthier and more sustainable catering [Accessed 22 Jul 2021]
[20] NHS Eat well [Accessed 06 Jul 2021]

National Institute for Health and Care Excellence (2015) Preventing excess weight gain (NICE guideline [NG7]) [Accessed 22 Jul 2021]

National Institute for Health and Care Excellence (2014) Obesity: identification, assessment and management (Clinical guideline [CG189]) [Accessed 22 Jul 2021]

National Institute for Health and Care Excellence Obesity: working with local communities overview (NICE pathway) [Accessed 22 Jul 2021]

National Institute for Health and Care Excellence Obesity overview (NICE pathway) [Accessed 22 Jul 2021]

National Institute for Health and Care Excellence Lifestyle weight management services for overweight or obese adults overview (NICE pathway) [Accessed 22 Jul 2021]

National Institute of Diabetes and Digestive and Kidney Diseases Understanding Adult Overweight & Obesity Treatment for Overweight & Obesity [Accessed 22 Jul 2021]

Royal College of Physicians (2015) Action on obesity: Comprehensive care for all [Accessed 22 Jul 2021]

Public Health England (2017) Weight management: guidance for commissioners and providers [Accessed 22 Jul 2021]

Public Health England (2017) Adult weight management: short conversations with patients [Accessed 22 Jul 2021]

Public Health England (2019) Adult obesity: applying All Our Health [Accessed 22 Jul 2021]

Public Health England (2020) Sugar reduction: progress report, 2015 to 2019 [Accessed 22 Jul 2021]

UK Government (2017) Childhood obesity: a plan for action [Accessed 22 Jul 2021]

Physical Activity

Context

Physical activity is a strong predictor of overall health and wellbeing. Lower levels of physical activity have been shown to be related to several eye conditions, including glaucoma, age related macular degeneration (AMD) and diabetic retinopathy (DR).

The relationship between lower levels of physical activity and eye disease is bidirectional. Visual impairment can significantly impact patient mobility and thus physical activity levels. Research has shown that visual impairment (corrected visual acuity worse than 20/40) was associated with a nearly 50% reduction in the time spent in moderate to vigorous physical activity states.[1] Whilst vision loss can significantly impair physical activity, increased levels of physical activity may protect against vision loss. Therefore, maintaining a healthy level of physical activity in individuals with visual impairment is especially important.

Glaucoma

Glaucoma can lead to significant visual field loss, affecting mobility, balance and increased risk of falling. An accelerometery study of glaucoma patients compared to people without glaucoma suggested that severity of visual field loss in glaucoma is associated with fewer daily steps and 21% less time spent in moderate to vigorous physical activity.[2] Laboratory studies also indicate a neuroprotective mechanism related to higher levels of physical activity[3] that could affect the development of glaucoma. Therefore, physical activity may have a role in preventing progression of glaucoma. Glaucoma field loss can deter patients from physical activity, thereby exacerbating potential worsening of disease.

Age related macular degeneration

AMD is a leading cause of irreversible blindness.[4] Not only does AMD limit physical activity but physical activity may also be protective against the progression of AMD. Physical inactivity has been associated with the development of macular drusen, a

[1] Willis JR, Vitale SE, Agrawal Y and others (2013) Visual impairment, uncorrected refractive error, and objectively measured balance in the United States JAMA Ophthalmol. 2013;131:1049–56 [Accessed 10 Jun 2021]
[2] Ramulu PY, Maul E, Hochberg C and others (2012) Real-world assessment of physical activity in glaucoma using an accelerometer Ophthalmology. 2012 Jun;119(6):1159-66 [Accessed 10 Jun 2021]
[3] Loprinzi PD, Herod SM, Cardinal BJ and others (2013) Physical activity and the brain: a review of this dynamic, bi-directional relationship Brain Res. 2013 Nov;1539:95–104 [Accessed 10 Jun 2021]
[4] Khandhadia S,Cherry J, Lotery AJ (2012) Age-Related Macular Degeneration. In: Ahmad SI (eds) Neurodegenerative Diseases. Advances in Experimental Medicine and Biology, vol 724. Springer, New York, NY. https://doi.org/10.1007/978-1-4614-0653-2_2 [Accessed 23 Jul 2021]

precursor for AMD.[5] Additionally, multiple longitudinal studies have shown greater physical activity levels decreases the risk of progression of AMD.[6,7]

Diabetic retinopathy

Physical activity is a well established modifiable risk factor for type 2 diabetes.[8] However, the relationship between physical activity and vision loss from DR is less well studied. Chronic inflammatory processes and glucose induced endothelial dysfunction underlie the development and progression of DR. Physical activity has been associated with improved vascular endothelial function[9] and is therefore thought to play a protective role in developing advanced DR. This has been supported by clinical studies objectively comparing physical activity levels to progression of DR.[10, 11, 12]

[5] Munch IC, Linneberg A, Larsen M (2013) Precursors of age-related macular degeneration: associations with physical activity, obesity, and serum lipids in the inter99 eye study Investigative Ophthalmology & Visual Science. 2013 Jun;54:3932-3940 [Accessed 10 Jun 2021]

[6] Knudtson MD, Klein R, Klein BE (2006) Physical activity and the 15-year cumulative incidence of age-related macular degeneration: the Beaver Dam Eye Study Br J Ophthalmol 2006 Dec;90(12):1461–1463 [Accessed 10 Jun 2021]

[7] Seddon JM, Cote J, Davis N and others (2003) Progression of age-related macular degeneration: association with body mass index, waist circumference, and waist-hip ratio Arch Ophthalmol 2003 Jun;121(6):785–792 [Accessed 10 Jun 2021]

[8] Department of Health and Social Care (2019) Physical activity guidelines: UK Chief Medical Officers' report [Accessed 22 Jun 2021]

[9] Di Francescomarino S, Sciartilli A, Di Valerio V and others (2009) The effect of physical exercise on endothelial function Sports Med. 2009;39(10):797–812 [Accessed 10 Jun 2021]

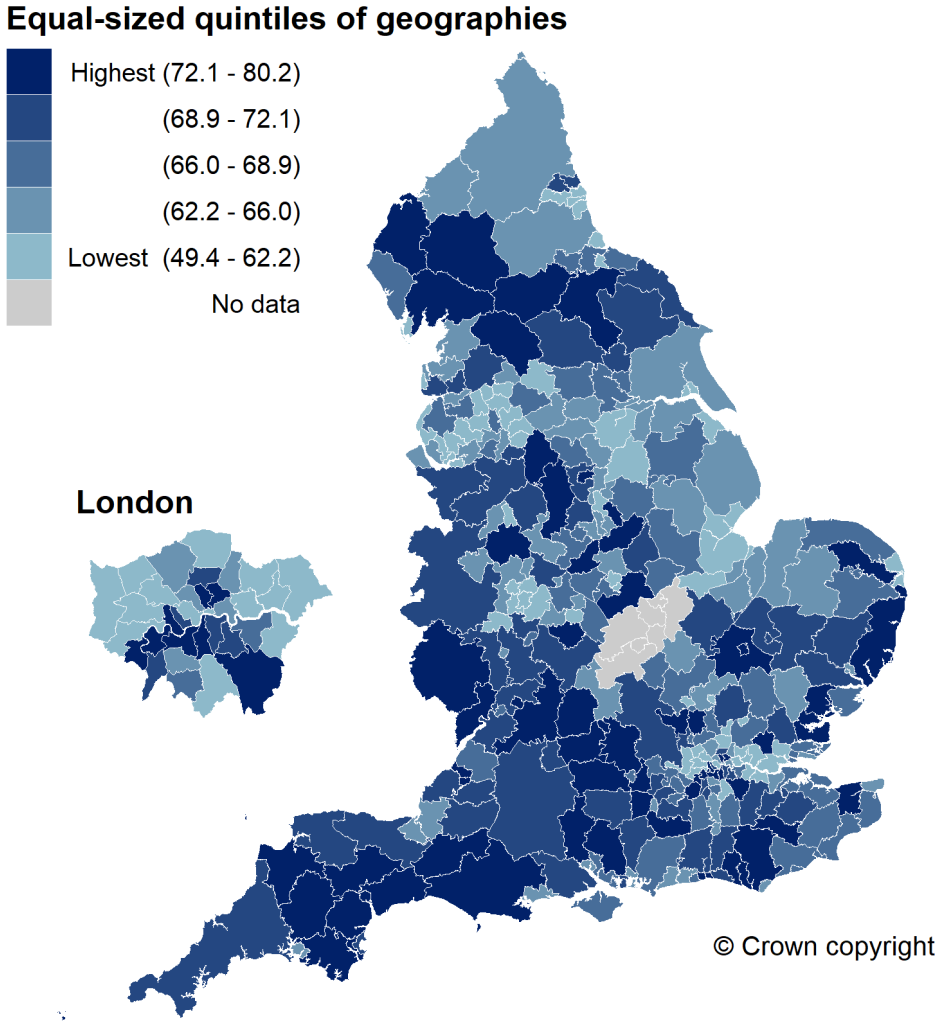
[10] Anuradha S, Dunstan DW, Healy GN and others (2011) Physical activity, television viewing time, and retinal vascular caliber Med Sci Sports Exerc. 2011 Feb;43(2):280–286 [Accessed 10 Jun 2021]

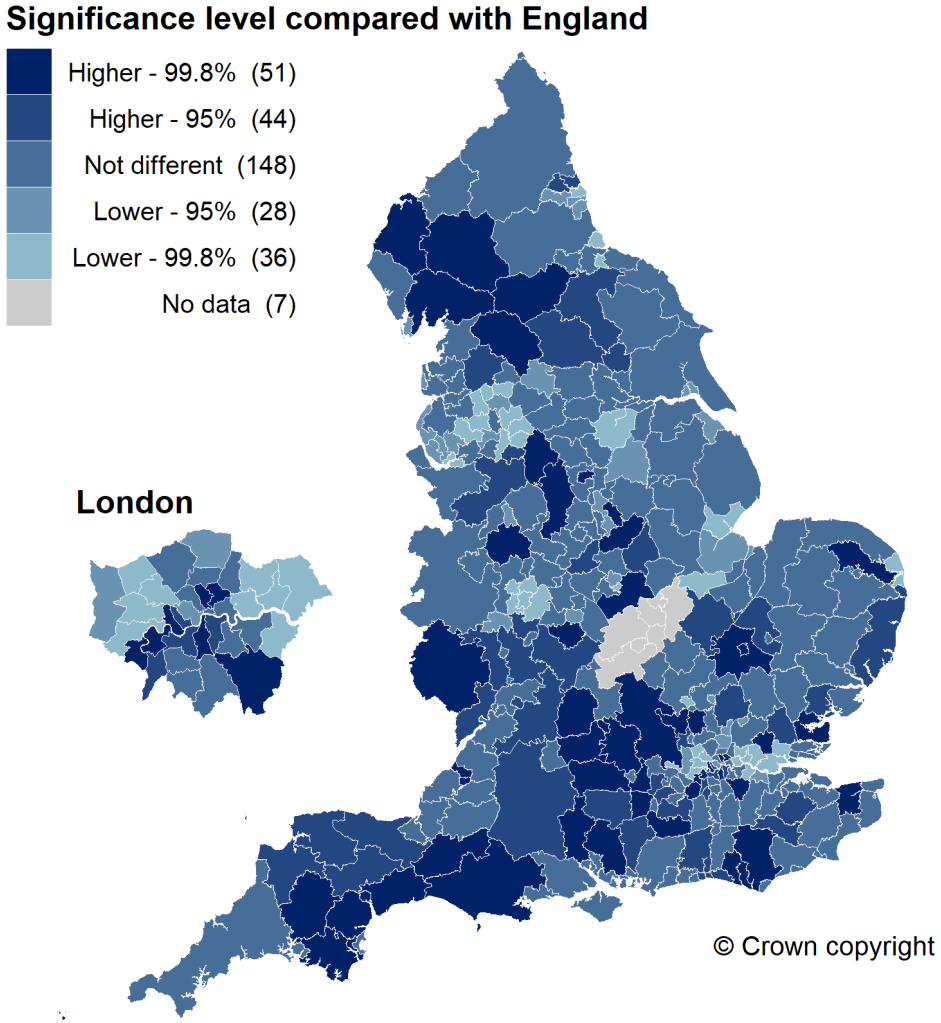
[11] Tikellis G, Anuradha S, Klein R and others (2010) Association between physical activity and retinal microvascular signs: the Atherosclerosis Risk in Communities (ARIC) Study Microcirculation. 2010 Jul;17(5):381–393 [Accessed 10 Jun 2021]

[12] Loprinzi PD, Joyner C (2016) Accelerometer-determined physical activity and mortality in a national prospective cohort study: considerations by visual acuity Prev Med. 2016 Jun;87:18–21 [Accessed 10 Jun 2021]

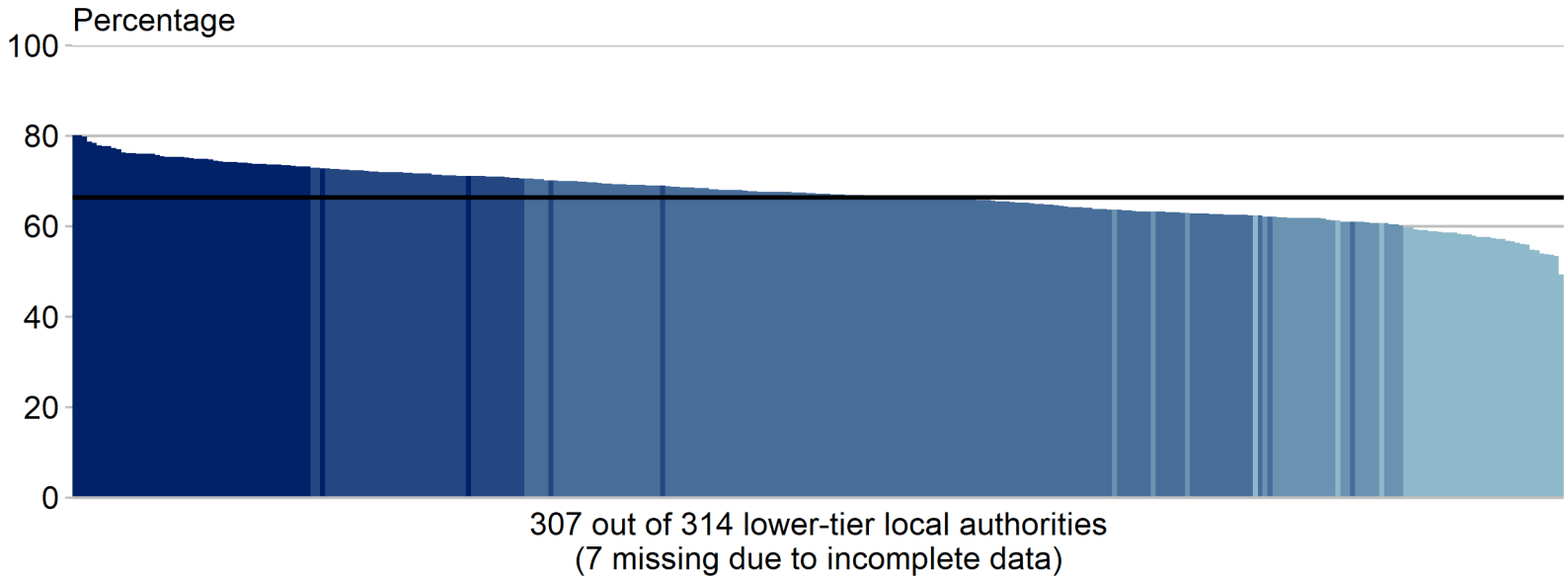
Map 13: Variation in percentage of people aged 19 years and over that meet CMO recommendations for physical activity (150+ moderate intensity equivalent minutes per week) by lower-tier local authority (2019/20)

Optimum value: High

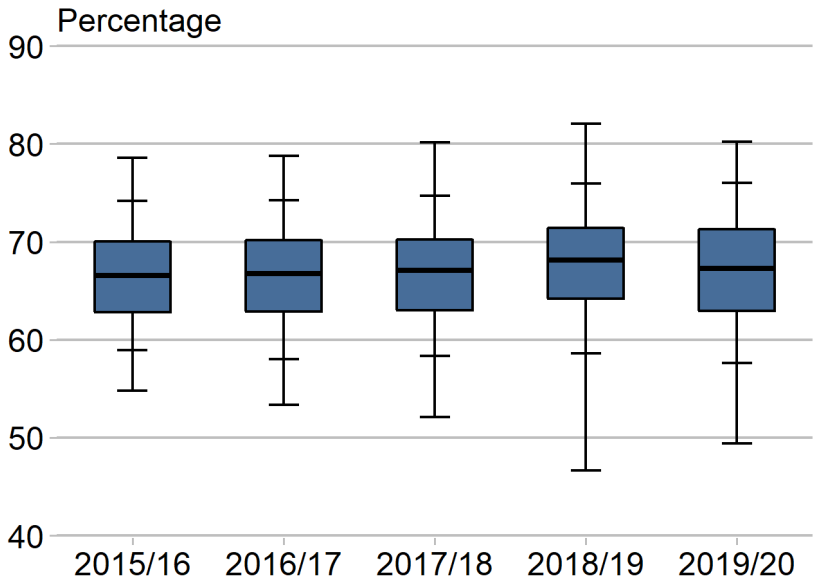




Column chart: Variation in percentage of people aged 19 years and over that meet CMO recommendations for physical activity (150+ moderate intensity equivalent minutes per week) by lower-tier local authority (2019/20)



Box plot time series: Variation in percentage of people aged 19 years and over that meet CMO recommendations for physical activity (150+ moderate intensity equivalent minutes per week) by lower-tier local authority (2015/16 to 2019/20)



Year	2015/16	2016/17	2017/18	2018/19	2019/20	
Max-Min (Range)	23.8	25.4	28.1	35.4	30.8	No significant change
75th-25th percentile	7.2	7.3	7.3	7.2	8.4	No significant change
95th-5th percentile	15.3	16.2	16.4	17.3	18.4	WIDENING Significant
Median	66.6	66.7	67.1	68.2	67.3	No significant change

Magnitude of Variation

Map 13: Variation in percentage of people aged 19 years and over that meet CMO recommendations for physical activity (150+ moderate intensity equivalent minutes per week) by lower-tier local authority

The maps and column chart display the latest period (2019/20), during which lower-tier local authority values ranged from 49.4% to 80.2%, which is a 1.6-fold difference between lower-tier local authorities.

The England value for 2019/20 was 66.4%.

The box plot shows the distribution of lower-tier local authority values for the period 2015/16 to 2019/20.

The 95th to 5th percentile gap widened significantly.

Neighbourhood design that promotes access to open spaces enables physical activity such as walking, cycling and running for leisure and travel. Access to open spaces varies, particularly for those living in deprived areas, influencing the prevalence of physical activity for some population groups.[13]

Age is markedly associated with levels of physical activity through its association with the prevalence of multiple health conditions and physical condition. Older adults are at a greater risk of falls, often resulting in avoidance of physical activity.

Other important factors that influence variations in recommended levels of physical activity include disability, ethnicity, health condition and culture.[14]

Options for action

Identifying areas and population groups with lower levels of physical activity is imperative for population level and targeted action. Ensuring there is widespread access to quality open spaces and approaches to support everyone to get more active and maintain activity levels is essential in order to enable recommended physical activity levels to be adhered to.

[13] Allen J and Balfour R (2014) Natural Solutions to Tackling Health Inequalities Institute of Health Equity [Accessed 22 Jul 2021]

[14] Public Health England (2014) Everybody active, every day: framework for physical activity Everybody active, every day: an evidence-based approach to physical activity [Accessed 23 Jun 2021]

A whole school approach, including education about the importance of physical activity is encouraged in school age children, partly through timetabled physical education.[15] Education and encouragement for adults can be given from employers who can promote and incorporate physical activity into workplace routines where possible.

Adopting a place based whole systems approach to physical activity, which includes creating an active environment, can help connect and align physical activity with other important local issues, such as air quality and other environmental issues.[14,16]

NICE guidance recommends that local authorities have a physical activity champion at a senior level in order to develop and implement local strategies, policies and plans for improving physical activity levels.[17]

Furthermore, targeted programmes for older adults must continue to be developed and endorsed. The value of activities that improve strength, balance and flexibility in older adults cannot be overstated; these components help to reduce the risk of falls, risk of social isolation, risk of mental and physical health morbidities; all are notable concerns in older adults.

People with eye diseases and disability are at increased risk of lower levels of physical activity due to the impact from poor visual function and associations with area deprivation. Lower levels of physical activity can further exacerbate their risk of eye disease progression as well as adversely impacting their general physical and mental health.

The Chief Medical Officer's Physical Activity Guidelines[8] advised the following for older adults (65 years and over):

- older adults should participate in daily physical activity to gain health benefits, including mental health, wellbeing and social functioning
- even light activity brings some health benefits compared to being sedentary
- older adults should maintain or improve their function by undertaking activities aimed at improving or maintaining muscle strength, balance and flexibility at least two days a week
- older adults should aim to accumulate at least 150 minutes of moderate intensity aerobic activity

[15] Public Health England (2020) What works in schools and colleges to increase physical activity What works in schools and colleges to increase physical activity? [Accessed 23 Jun 2021]
[16] Public Health England (2019) Health matters: whole systems approach to obesity [Accessed 22 Jun 2021]
[17] National Institute for Health and Care Excellence (2019) Physical activity: encouraging activity on the community (NICE quality standard [QS183]) [Accessed 09 Jun 2021]

Resources

British Blind Sport The National Disability Sport Organisation for people living with sight loss. Guidance and resources to support blind and partially sighted people get active and play sport [Accessed 20 Jul 2021]

British Blind Sport (2016) A Guide To Visually Impaired Friendly Sport [Accessed 20 Jul 2021]

Department of Health and Social Care (2019) Physical activity guidelines: UK Chief Medical Officers' report [Accessed 22 Jun 2021]

National Institute for Health and Care Excellence (2019) Physical activity: encouraging activity on the community (NICE quality standard [QS183]) [Accessed 09 Jun 2021]

National Institute for Health and Care Excellence (2013) Physical activity: brief advice for adults in primary care (NICE public health guideline [PH44]) [Accessed 09 Jun 2021]

National Institute for Health and Care Excellence (2014) Physical activity: exercise referral schemes (NICE public health guideline [PH54]) [Accessed 09 Jun 2021]

National Institute for Health and Care Excellence (2009) Physical activity for children and young people (NICE public health guideline [PH17]) [Accessed 09 Jun 2021]

National Institute for Health and Care Excellence (2008) Physical activity in the workplace (NICE public health guideline [PH13]) [Accessed 09 Jun 2021]

National Institute for Health and Care Excellence (2012) Physical activity: walking and cycling (NICE public health guideline [PH41]) [Accessed 09 Jun 2021]

NHS Digital (2017) Health Survey for England, 2016 [Accessed 09 Jun 2021]

Public Health England (2014) Everybody active, every day: framework for physical activity [Accessed 09 Jun 2021]

Public Health England Health matters: physical activity – prevention and management of long-term conditions [Accessed 20 July 2021]

Public Health England (2019) Health matters: whole systems approach to obesity [Accessed 22 Jul 2021]

Public Health England Physical Activity [Accessed 23 Jun 2021]

Public Health England (2015) Physical activity: applying All Our Health [Accessed 09 Jun 2021]

Public Health England (2017) Spatial planning for health: evidence review Spatial planning for health: an evidence resource for planning and designing healthier places [Accessed 22 Jul 2021]

Sport England Active lives [Accessed 22 Jun 2021]

Sport England Moving Healthcare Professionals [Accessed 22 Jun 2021]

Smoking

Context

Tobacco smoking is the leading preventable cause of morbidity and premature mortality in the UK.[1] The health consequences of smoking are numerous and are estimated to cost the NHS approximately £2.6 billion a year.[2]

As well as lung cancer, COPD and cardiovascular disease, smoking causes diseases across the full spectrum of major organ systems and crosses almost all areas of medicine.[3] Tobacco smoke contains toxic substances that when inhaled are distributed to the rest of the body; these chemicals cause damage through mechanisms including DNA damage, inflammation and oxidative stress.[4]

Many chronic ocular conditions have been linked to smoking, including:

- age related macular degeneration (AMD)
- cataracts
- diabetic retinopathy (DR)
- retinal ischaemia
- anterior ischaemic optic neuropathy
- thyroid eye disease (TED)/ Grave's ophthalmopathy
- alcohol amblyopia

AMD is a common cause of severe visual impairment that is irreversible and often difficult to treat. Tobacco smokers have a 2 to 4 fold increase in risk for AMD when compared to individuals that have never smoked.[5] A systematic review estimates the relative risk of AMD in smokers is 1.86 (95% CI 1.27 to 2.73).[6] Stopping or avoiding smoking is therefore an essential part of managing this condition. A couple of laboratory

[1] NHS Digital Statistics on Smoking, England - 2019 [Accessed 12 May 2021]
[2] Public Health England (2017) Cost of smoking to the NHS in England: 2015 [Accessed 12 May 2021]
[3] Royal College of Physicians (2018) Hiding in plain sight: Treating tobacco dependency in the NHS [Accessed 12 May 2021]
[4] Centers for Disease Control and Prevention (US); National Center for Chronic Disease Prevention and Health Promotion (US); Office on Smoking and Health (US) (2010) How Tobacco Smoke Causes Disease: The Biology and Behavioral Basis for Smoking-Attributable Disease: A Report of the Surgeon General [Accessed 26 Jul 2021]
[5] Smith W, Assink J, Klein R and others (2001) Risk factors for age-related macular degeneration: Pooled findings from three continents Ophthalmology 108(4):697–704 [Accessed 12 May 2021]
[6] Chakravarthy U, Wong TY, Fletcher A and others (2010) Clinical risk factors for age-related macular degeneration: a systematic review and meta-analysis BMC Ophthalmol 10:31 [Accessed 12 May 2021]

studies have demonstrated that nicotine can stimulate angiogenesis, a pathogenic pathway associated with wet AMD.[7, 8, 9]

Cataracts are the main cause of reversible blindness worldwide. There is a well-established association between smoking and cataract formation. A systematic review of cohort studies estimates an odds ratio of 1.47 (95% CI 1.36 to 1.59) for the onset of cataracts among current smokers and 1.19 (95% CI 1.01 to1.41) in former smokers.[10] Importantly, smoking cessation results in a decreased risk of cataract formation.[11,12]

DR is also a leading cause of visual impairment linked to smoking. Smoking is a significant risk factor for developing DR in both type 1 and type 2 diabetics.[13,14] There is also a higher prevalence of smokers in more deprived areas, where multiple risk factors converge to potentially amplify risks of blindness from DR.

Grave's ophthalmopathy, an autoimmune inflammatory eye disorder also known as TED, is also linked to tobacco smoke, with cohort studies showing that people who smoke have over twice the risk of developing TED.[15]

Maternal smoking is a source of significant health inequality and it is associated with a number of ocular defects in unborn children including: astigmatism, anophthalmia, microphthalmia, strabismus and optic nerve hypoplasia.[16,17] Data from booking appointments show mothers in the most deprived decile to be almost 6 times more likely

[7] Lee J and Cooke JP (2012) Nicotine and Pathological Angiogenesis Life Sci 91(21-22):1058-64 [Accessed 28 Jul 2021]
[8] Suner IJ, Espinosa-Heidmann DE, Marin-Castano ME and others (2004) Nicotine increases size and severity of experimental choroidal neovascularization Invest Ophthalmol Vis Sci 45(1):311-7 [Accessed 28 Jul 2021]
[9] Pons M and Marin-Castano ME (2011) Nicotine Increases the VEGF/PEDF Ratio in Retinal Pigment Epithelium: A Possible Mechanism for CNV in Passive Smokers with AMD. Invest Ophthalmol Vis Sci 52(6): 3842–3853 [Accessed 28 Jul 2021]
[10] Ye J, He J, Wang C and others (2012) Smoking and Risk of Age-Related Cataract: A Meta-Analysis Invest Ophthalmol Vis Sci 53:3885–95 [Accessed 12 May 2021]
[11] Lindblad BE, Hakansson N and Wolk A (2014) Smoking Cessation and the Risk of Cataract: A Prospective Cohort Study of Cataract Extraction Among Men JAMA Ophthalmol 132(3):253-257 [Accessed 02 Jun 2021]
[12] Lindblad BE, Hakansson N, Svensson H and others (2005) Intensity of Smoking and Smoking Cessation in Relation to Risk of Cataract Extraction: A Prospective Study of Women Am J Epidemiol 162:73–9 [Accessed 02 Jun 2021]
[13]Hammes HP, Kerner W, Hofer S and others (2011) Diabetic retinopathy in type 1 diabetes-a contemporary analysis of 8,784 patients Diabetologia 54(8):1977-1984 [Accessed 02 Jun 2021]
[14] Zhong ZL, Han M and Chen S (2011) Risk factors associated with retinal neovascularization of diabetic retinopathy in type 2 diabetes mellitus International Journal of Ophthalmology 4(2):182-185 [Accessed 12 May 2021]
[15] Thornton J, Kelly S, Harrison R and others (2007) Cigarette smoking and thyroid eye disease: a systematic review Eye 21:1135–1145 [Accessed 12 May 2021]
[16] Hackshaw A, Rodeck C and Boniface S (2011) Maternal smoking in pregnancy and birth defects: a systematic review based on 173 687 malformed cases and 11.7 million controls Human reproduction update 17(5):589-604 [Accessed 12 May 2021]
[17] Pueyo V, Güerri N, Oros D and others (2011) Effects of smoking during pregnancy on the optic nerve neurodevelopment Early human development 87(5):331-4 [Accessed 12 May 2021]

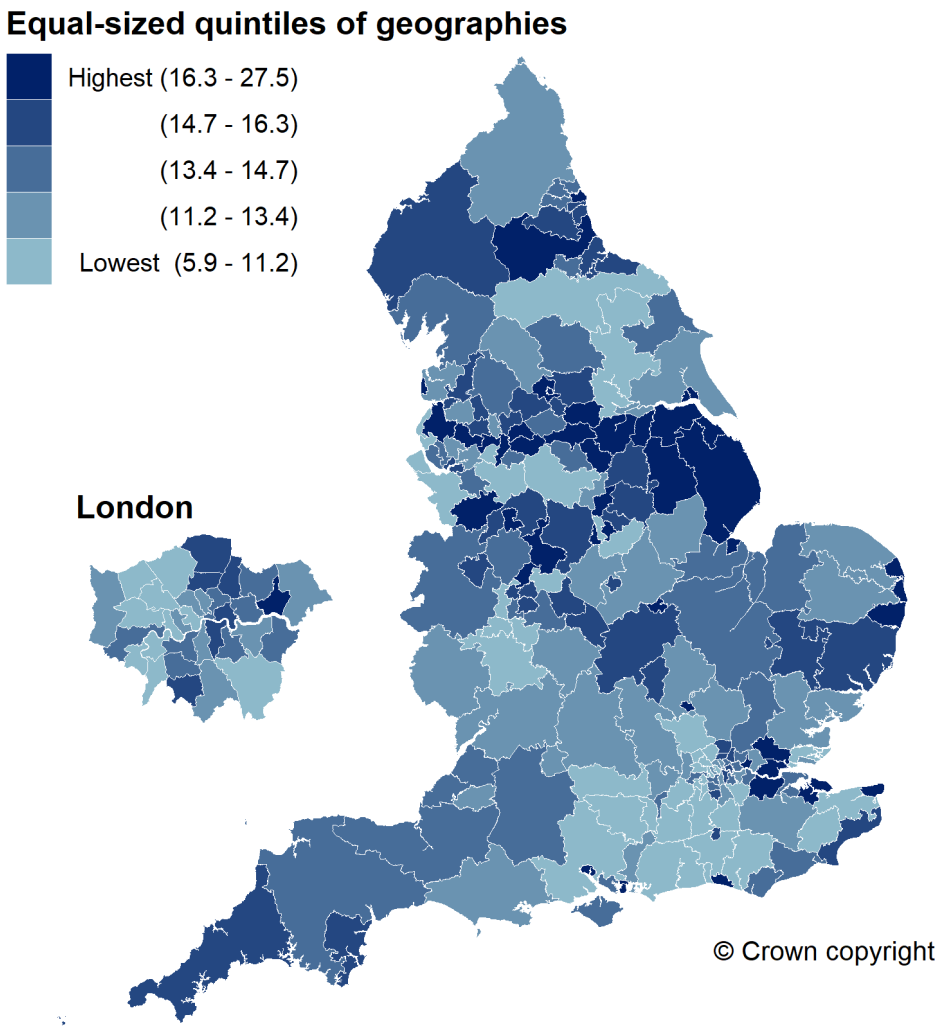
to actively smoke than those in the least deprived decile (24.7% compared to 4.1%).[18] This further exacerbates eye health inequalities.

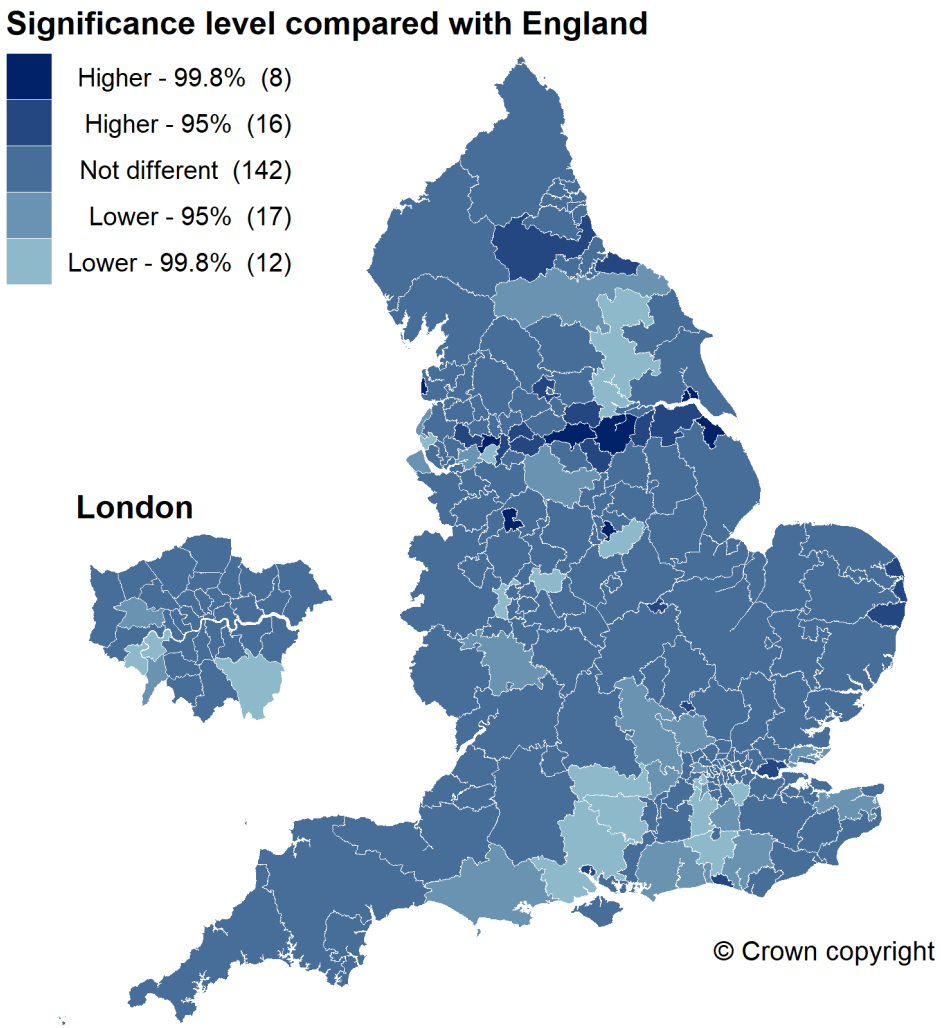
Smoking is the leading avoidable cause of death, disability and social inequalities in health within the UK. As such, the Royal College of Physicians state that smoking prevention and cessation should therefore be the highest priority in medicine.[3]

[18] Public Health England (2019) Health of women before and during pregnancy: health behaviours, risk factors and inequalities [Accessed 12 May 2021]

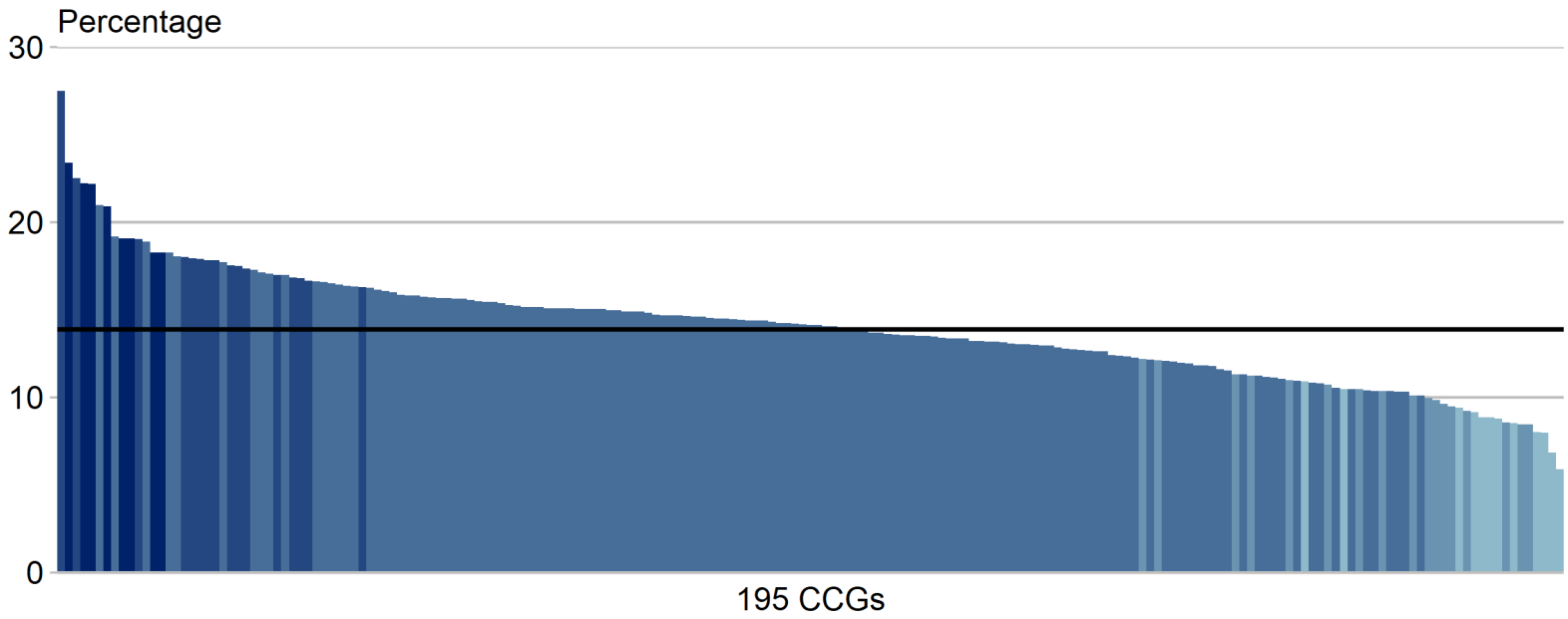
Map 14a: Variation in percentage of people aged 18 years and over self-reporting as smokers by clinical commissioning group (2019)

Optimum value: Low

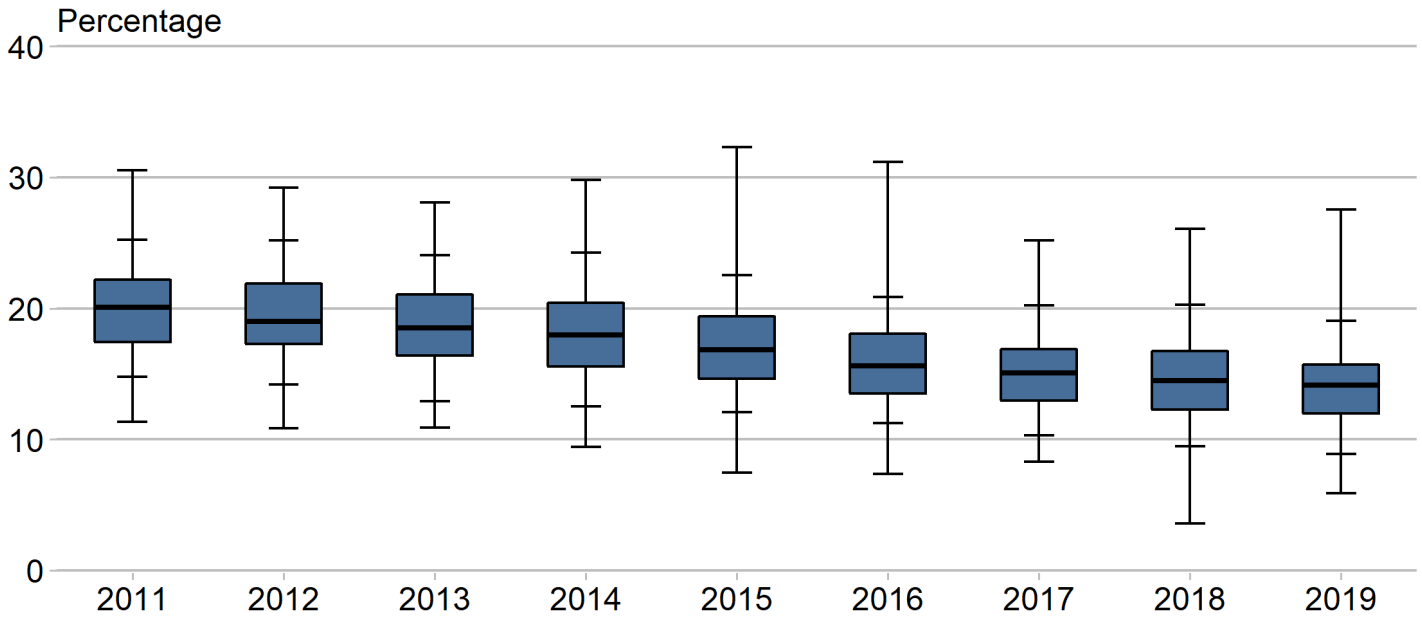




Column chart: Variation in percentage of people aged 18 years and over self-reporting as smokers by CCG (2019)



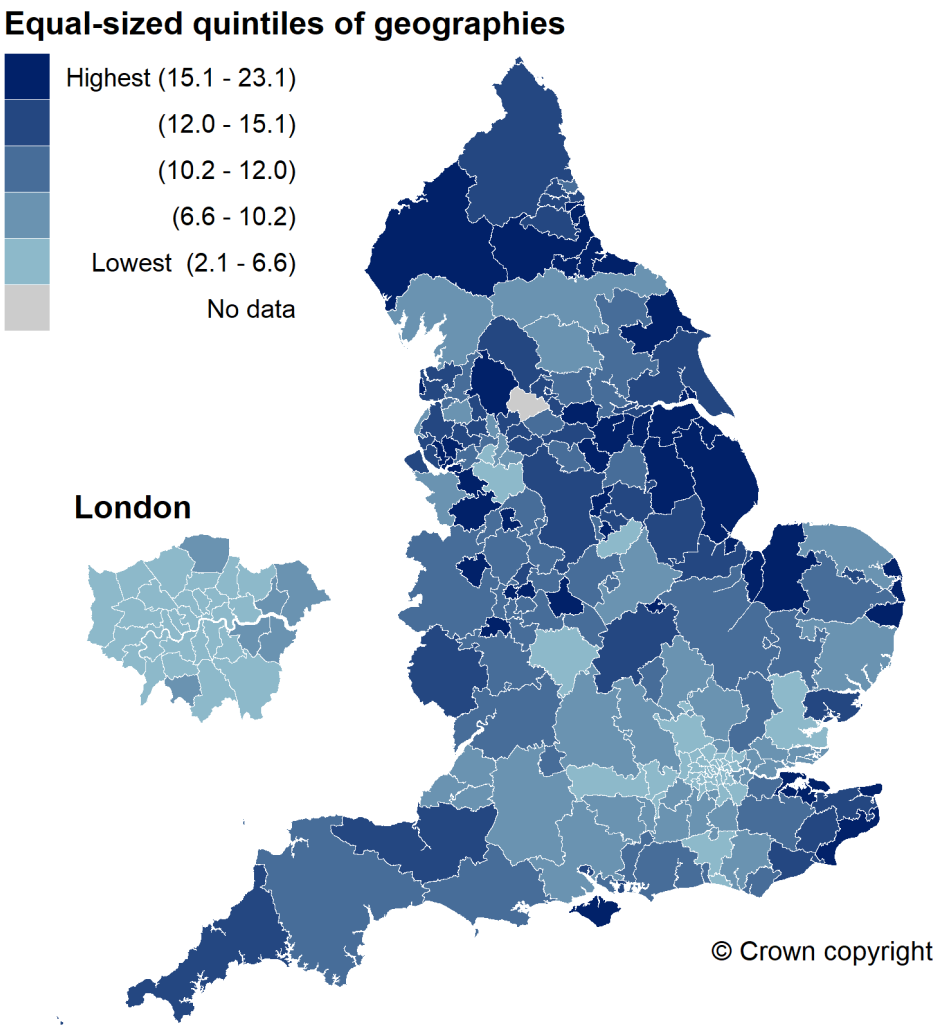
Box plot time series: Variation in percentage of people aged 18 years and over self-reporting as smokers by CCG (2011 to 2019)

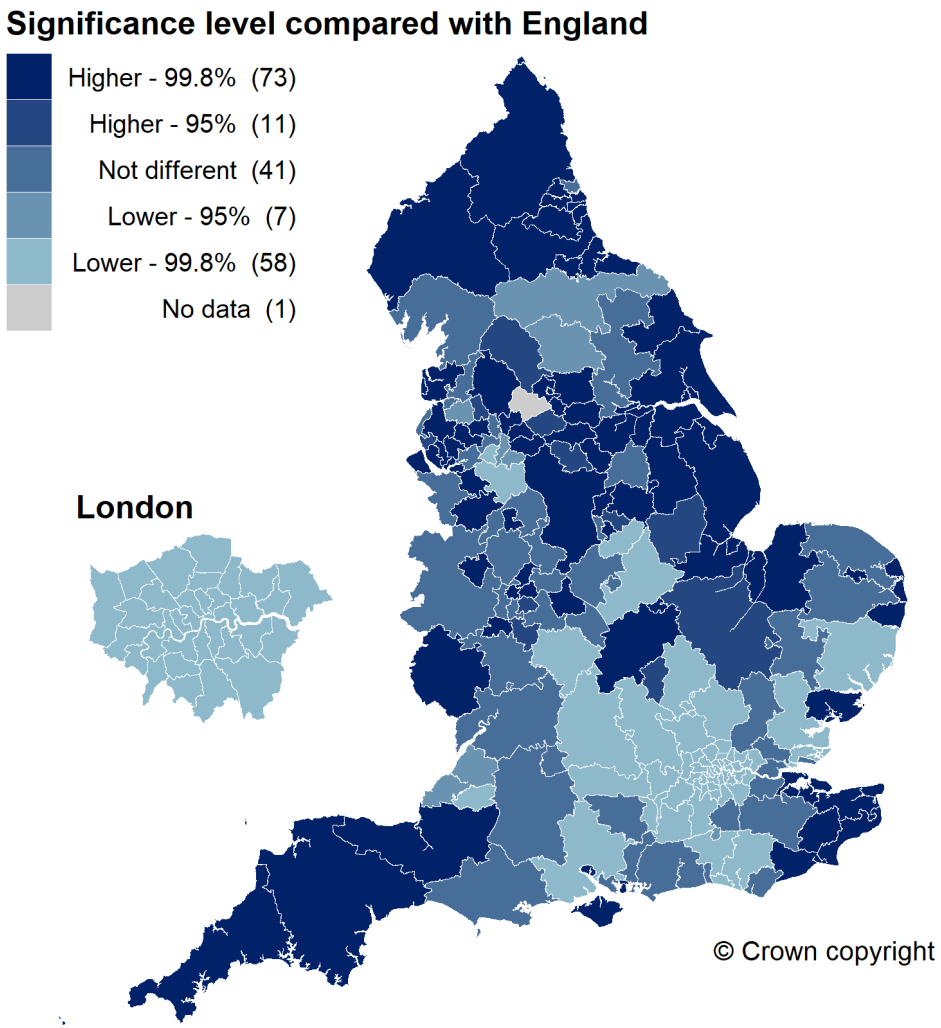


Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	
Max-Min (Range)	19.2	18.4	17.2	20.4	24.8	23.8	16.9	22.5	21.6	No significant change
75th-25th percentile	4.8	4.6	4.6	4.9	4.7	4.6	3.9	4.5	3.7	NARROWING Significant
95th-5th percentile	10.4	11.0	11.1	11.7	10.5	9.7	9.9	10.8	10.2	No significant change
Median	20.1	19.0	18.5	17.9	16.9	15.6	15.1	14.5	14.1	DECREASING Significant

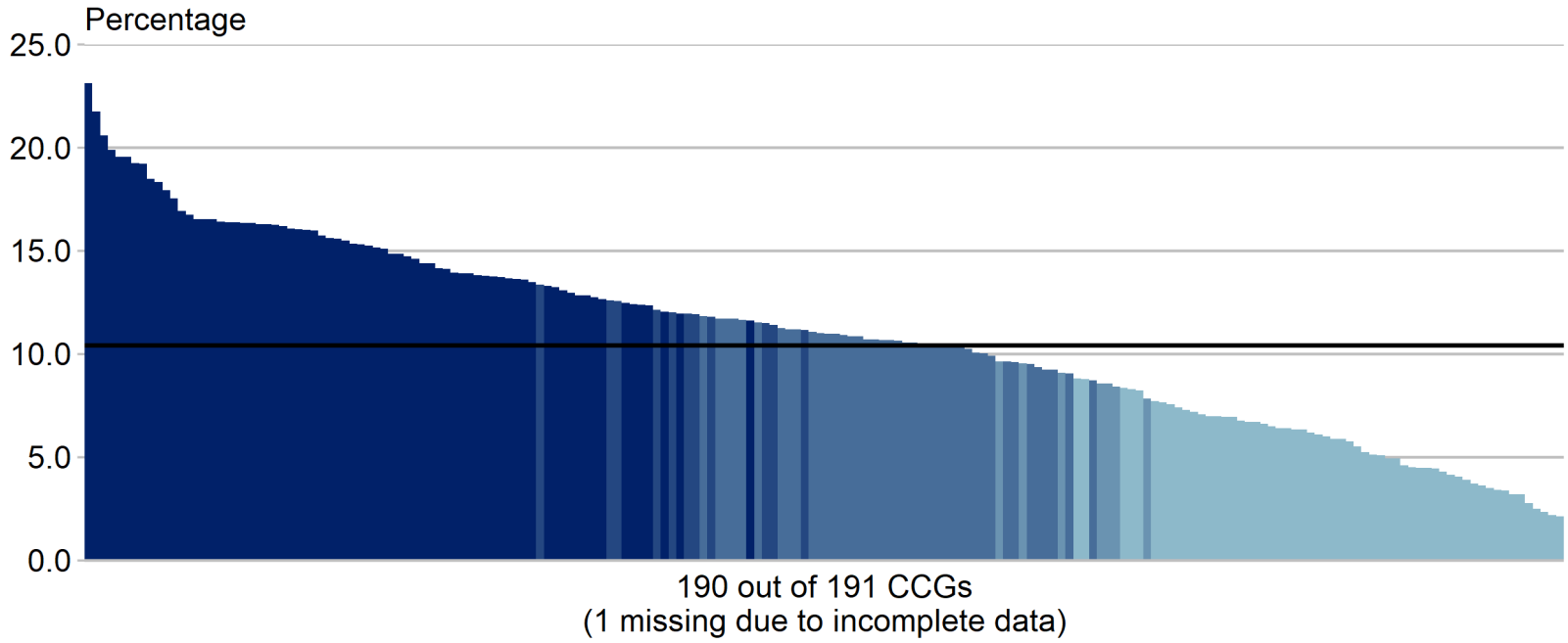
Map 14b: Variation in percentage of women who are known to smoke at time of delivery by clinical commissioning group (2019/20)

Optimum value: Low

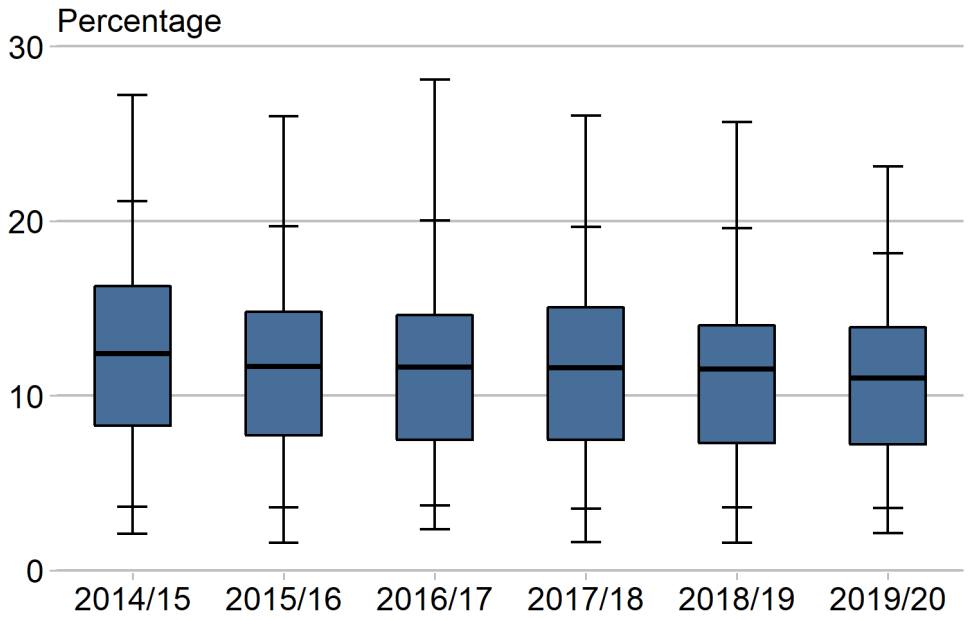




Column chart: Variation in percentage of women who are known to smoke at time of delivery by CCG (2019/20)



Box plot time series: Variation in percentage of women who are known to smoke at time of delivery by CCG (2014/15 to 2019/20)



Year	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	
Max-Min (Range)	25.1	24.4	25.8	24.4	24.1	21.0	No significant change
75th-25th percentile	8.0	7.1	7.1	7.6	6.7	6.7	No significant change
95th-5th percentile	17.5	16.1	16.3	16.1	16.0	14.6	NARROWING Significant
Median	12.4	11.7	11.6	11.6	11.5	11.0	DECREASING Significant

Magnitude of Variation

Map 14a: Variation in percentage of people aged 18 years and over self-reporting as smokers by clinical commissioning group

The maps and column chart display the latest period (2019), during which clinical commissioning group (CCG) values ranged from 5.9% to 27.5%, which is a 4.7-fold difference between CCGs.

The England value for 2019 was 13.9%.

The box plot shows the distribution of CCG values for the period 2011 to 2019.

The 75th to 25th percentile gap narrowed significantly.

The median decreased significantly from 20.1% in 2011 to 14.1% in 2019.

Map 14b: Variation in percentage of women who are known to smoke at time of delivery by clinical commissioning group

The maps and column chart display the latest period (2019/20), during which CCG values ranged from 2.1% to 23.1%, which is a 10.8-fold difference between CCGs.

The England value for 2019/20 was 10.4%.

The box plot shows the distribution of CCG values for the period 2014/15 to 2019/20.

The 95th to 5th percentile gap narrowed significantly.

The median decreased significantly from 12.4% in 2014/15 to 11.0% in 2019/20.

Smoking prevalence in England has declined year on year since 2011 and is now at a record low. However, it is clear that inequalities still exist with a vast 10.8-fold difference in prevalence between CCGs for women who are known to smoke at time of delivery and a large 4.7-fold difference for adults self-reporting as smokers

Health inequalities vastly influence the prevalence of smoking across England. Key factors include socioeconomic status, education attainment, ethnicity and mental health. Given the extensive adverse health outcomes associated with smoking, this variation renders further differences in morbidity and mortality rates across England. In turn, smoking is the most significant driver of health inequalities.

Smoking is much more common in low socioeconomic groups. It is also harder to tackle in such groups due to the societal and cultural affiliation; the activity is passed through generations and reinforced by role models who may smoke. Access to tobacco is also increased in such environments, triggering young people to become regular life long smokers.

Whilst inter CCG variation in smoking is inextricably linked to health inequalities and socioeconomic deprivation, variations within CCGs also exist due to higher rates amongst people with mental health conditions and lesbian, gay, bisexual and trans (LGBT) people.

Options for action

To reduce this variation across England and within local communities, there is a need to identify those communities at greatest risk and curate measures that target and positively impact these higher prevalence groups.

Education and early intervention are crucial for engendering a smoke free generation. Training professionals on smoking cessation is particularly important for the successful treatment of tobacco dependence.

Extensive evidence exists on smoking cessation. In conjunction with cessation advice, behavioural support, pharmacotherapies and the use of nicotine replacement are all effective, especially in combination.

The challenge is therefore not due to a lack of effective management options, but in encouraging access by smokers and promoting these services.

There is extensive NICE guidance on smoking cessation which covers the following recommendations:

- identify and prioritise groups at high risk of tobacco related harm
- campaigns to promote awareness of local stop smoking services
- engage with people who smoke
    - opportunistic interviewing and advise in a way that is sensitive to their preferences and needs
    - encourage people being referred for elective surgery to stop smoking before their operation

- ensure the following evidence-based interventions are available for adult smokers:
    - behavioural support
    - bupropion
    - nicotine replacement therapy

    - varenicline
- set targets for stop smoking services
    - treating at least 5% of the local population who smoke each year
    - achieving a successful quit rate of at least 35% at 4 weeks (confirmed by carbon monoxide monitoring of exhaled breath)

- education for persons not ready to quit smoking
    - ensure they understand stopping smoking reduces the risk of smoking-related illnesses
    - encouraging adopting a harm reduction approach[19]

Resources

Department of Health and Social Care (2018) Tobacco control plan: delivery plan 2017 to 2022 [Accessed 12 May 2021]

National Institute for Health and Care Excellence (2013) Smoking: acute, maternity and mental health services (NICE Public health guideline [PH48]) [Accessed 12 May 2021]

National Institute for Health and Care Excellence (2013) Smoking: harm reduction (NICE Public health guideline [PH45]) [Accessed 12 May 2021]

National Institute for Health and Care Excellence (2010) Smoking prevention in schools (NICE Public health guideline [PH23]) [Accessed 12 May 2021]

National Institute for Health and Care Excellence (2008, updated 2014) Smoking: preventing uptake in children and young people (Public health guidance [PH14] [Accessed 12 May 2021]

National Institute for Health and Care Excellence (2010) Smoking: stopping in pregnancy and after childbirth (NICE Public health guideline [PH26]) [Accessed 12 May 2021]

National Institute for Health and Care Excellence (2007) Smoking: workplace interventions (NICE Public health guideline (PH5]) [Accessed 12 May 2021]

National Institute for Health and Care Excellence (2018) Stop smoking interventions and services (NICE guideline [NG92]) [Accessed 12 May 2021]

[19] National Institute for Health and Care Excellence (2013) Smoking: harm reduction (NICE Public health guideline [PH45]) [Accessed 12 May 2021]

Preterm Birth

Context

Preterm is defined by the World Health Organization (WHO) as babies born alive before 37 weeks' gestation.[1] Preterm is further subcategorised into moderately preterm (32 to 37 weeks' gestation), very preterm (28 to 32 weeks' gestation) and extremely preterm (before 28 weeks).[1] Worldwide around 10% of babies are born prematurely and premature birth is the leading cause of death in those under the age of 5.[1,2] In England and Wales approximately 1.3% of infants per year are born very or extremely preterm.[3] Children born prematurely may face lifelong problems such as physical or learning disability, hearing problems[4] and visual abnormalities.[5]

In the UK, the commonest cause of reduced vision in children is amblyopia secondary to refractive error or strabismus.[6] These are all conditions that disproportionately affect premature children[7], who are particularly susceptible to visual and ophthalmic problems, as the development of normal visual function depends on the perfectly coordinated timing and interaction of extremely complex processes.[8] Around 3% of children born prematurely experience visual impairment of which one-third were blind.[9] This blindness is frequently due to either retinopathy of prematurity (ROP), cerebral visual impairment or optic nerve disorders.[10,11] ROP is of particular interest as the resultant blindness is avoidable if identified and treated early.[12]

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[1] World Health Organization (2018) WHO: Preterm birth fact sheets [Accessed 23 Nov 2020]
[2] Lawn JE, Kinney MV, Belizan JM, and others (2013) Born too soon: accelerating actions for prevention and care of 15 million newborns born too soon Reprod Health 2013;10 Suppl 1:S6 [Accessed 23 Nov 2020]
[3] Office for National Statistics (7 December 2020) Provisional births in England and Wales: 2020 [Accessed 22 Jun 2021]
[4] Wroblewska-Seniuk K, Greczka G, Dabrowski P and others (2017) Hearing impairment in premature newborns-Analysis based on the national hearing screening database in Poland PloS one 12(9), e0184359 [Accessed 20 Jul 2021]
[5] Pétursdóttir D, Holmström G, and Larsson E (2020) Visual function is reduced in young adults formerly born prematurely: a population-based study Br J Ophthalmol 104(4), 541–546 [Accessed 20 Jul 2021]
[6] Williams C, Northstone K, Howard M, and others (2008) Prevalence and risk factors for common vision problems in children: data from the ALSPAC study Br J Ophthalmol 2008 Jul; 92(7):959–64 [Accessed 23 Nov 2020]
[7] Birch EE, O'Connor AR (2001) Preterm birth and visual development Semin Neonatol 2001 Dec;6(6):487–97 [Accessed 23 Nov 2020]
[8] Pueyo V, González I, Altemir I and others (2015) Microstructural changes in the retina related to prematurity Am J Ophthalmol Apr;159(4):797–802 [Accessed 23 Nov 2020]
[9] Holmström GE, Källen K, Hellström A and others (2014) Ophthalmologic outcome at 30 months' corrected age of a prospective Swedish cohort of children born before 27 weeks of gestation: the extremely preterm infants in Sweden study JAMA Ophthalmol 2014 Feb;132(2):182–9 [Accessed 23 Nov 2020]
[10] Solebo AL, Rahi J (2014) Epidemiology, aetiology and management of visual impairment in children Arch Dis Child 2014 Apr 1 [cited 2014 Sep 9];99(4):375–9 [Accessed 23 Nov 2020]
[11] Kong L, Fry M, Al-Samarraie M and others (2012) An update on progress and the changing epidemiology of causes of childhood blindness worldwide J AAPOS 2012 Dec [cited 2014 Sep 9];16(6):501–7 [Accessed 23 Nov 2020]
[12] Gilbert C, Muhit M (2008) Twenty years of childhood blindness: what have we learnt? Community eye Heal 2008 Sep;21(67):46–7 [Accessed 23 Nov 2020]

ROP is a potentially sight impairing proliferative retinal vascular disease affecting low birthweight neonates and those born before 32 weeks. An international classification exists based on the principle that disease severity relates to the amount of retinal vascular tissue involved and how posterior the disease location.[13,14] Early treatment is key to short and long-term visual outcomes.[15] Current good practice should ensure the availability of timely assessment and management of preterm babies as recommended by the Royal College of Ophthalmologists.[16] Around 14% of infants screened require treatment through dense peripheral retinal ablation, the aim of which is to prevent progression and reversing the growth of abnormal vessels. Originally cryotherapy was used, but current UK guidelines are based on use of laser therapy. Those born earliest are most affected[17] and around 10% of children treated require repeat treatments.[18] In recent years anti-vascular endothelial growth factor (anti-VEGF) have been approved for use in ROP treatment, however the safety and efficacy of mono-therapy or a combination of anti-VEGF and laser treatment remains uncertain particularly in terms of disease recurrence and potential extra-ocular side effects due to systemic absorption.[19]

Table 15.1 illustrates that failure to meet ROP screening timescales in over 10% of cases occurred in 11% of neonatal intensive care units, 12% of local neonatal units and 17% of special care units. Table 15.2 presents the number of eligible babies meeting the 2008 ROP screening criteria by type of unit. Neonatal intensive care units (NICU) experience the highest numbers of eligible babies closely followed by local neonatal units (LNU).

[13] International Committee for the Classification of Retinopathy of Prematurity (2005) The International Classification of Retinopathy of Prematurity revisited Arch Ophthalmol (Chicago, Ill 1960) 2005 Jul;123(7):991–9 [Accessed 23 Nov 2020]
[14] Committee for the Classification of Retinopathy of Prematurity (1984) An international classification of retinopathy of prematurity Arch Ophthalmol (Chicago, Ill 1960)1984 Aug;102(8):1130–4 [Accessed 23 Nov 2020]
[15] Good WV (2004) Early Treatment for Retinopathy of Prematurity Cooperative Group (2004) Final results of the Early Treatment for Retinopathy of Prematurity (ETROP) randomized trial Trans Am Ophthalmol Soc 2004;102:233–48; discussion 248-50 [Accessed 23 Nov 2020]
[16] Royal College of Ophthalmologists & Royal College of Paediatrics and Child Health (2008) Guideline for the Screening and treatment of retinopathy of Prematurity [Accessed 23 Nov 2020]
[17] Tavassoli S, Wach R, Haynes R and others (2019) Estimate of incidence of ROP requiring treatment in extreme preterms and impact on service-7 year review in tertiary unit Eye (Lond) 2019;33(5):845–9 [Accessed 23 Nov 2020]
[18] Adams GG, Bunce C, Xing W and others (2018) Retinopathy of prematurity in the United Kingdom: retreatment rates, visual and structural 1-year outcomes Eye (Lond) 2018;32(11):1752–9 [Accessed 23 Nov 2020]
[19] Sankar MJ, Sankar J, Chandra P (2018) Anti-vascular endothelial growth factor (VEGF) drugs for treatment of retinopathy of prematurity Cochrane database Syst Rev 2018;1:CD009734 [Accessed 23 Nov 2020]

Table 15.1: Number of Neonatal / Special Care Baby units by percentage band 2019[20]

Type of unit		100%	90.0% to 99.9%	50.0% to 89.9%	Total units
NICU	Neonatal Intensive Care Unit	9	30	5	**44**
LNU	Local Neonatal Unit	31	36	9	**76**
SCU	Special Care Unit	20	9	6	**35**
All units		**60**	**75**	**20**	**155**

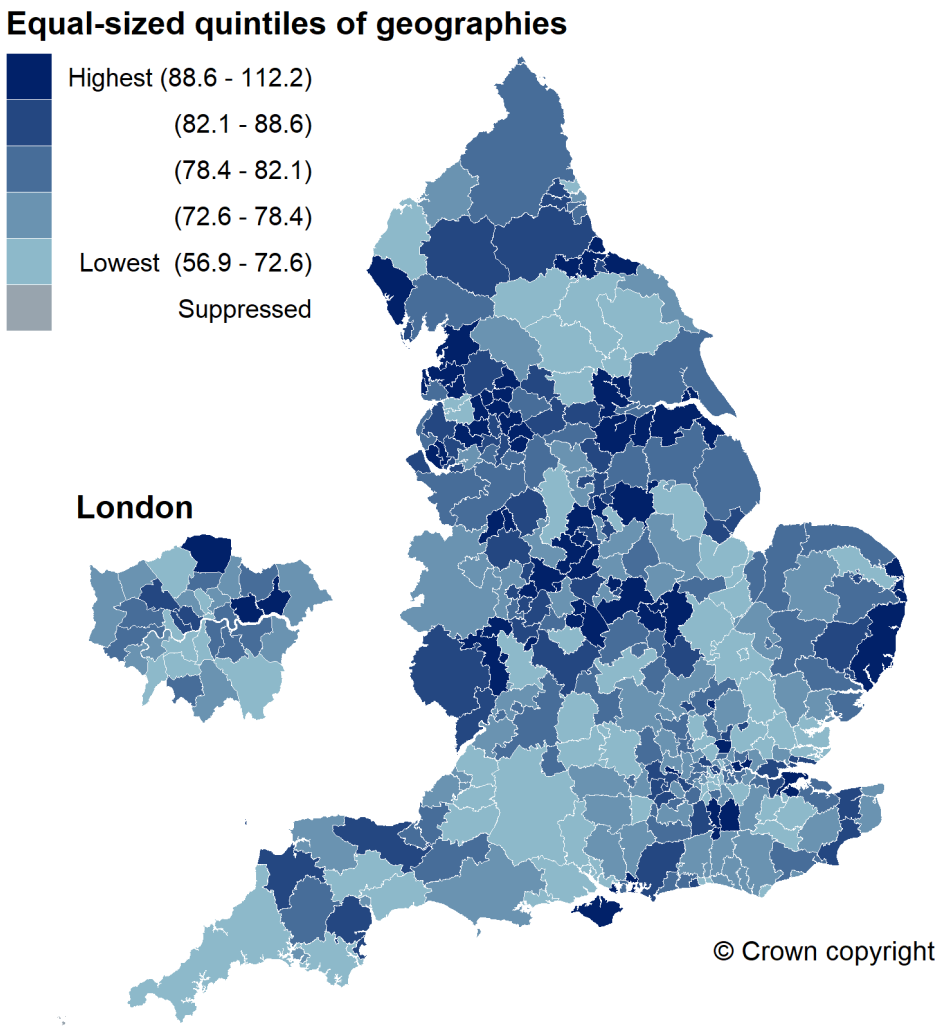
Table 15.2: Number of eligible babies by type of Neonatal / Special care baby unit 2019[20]

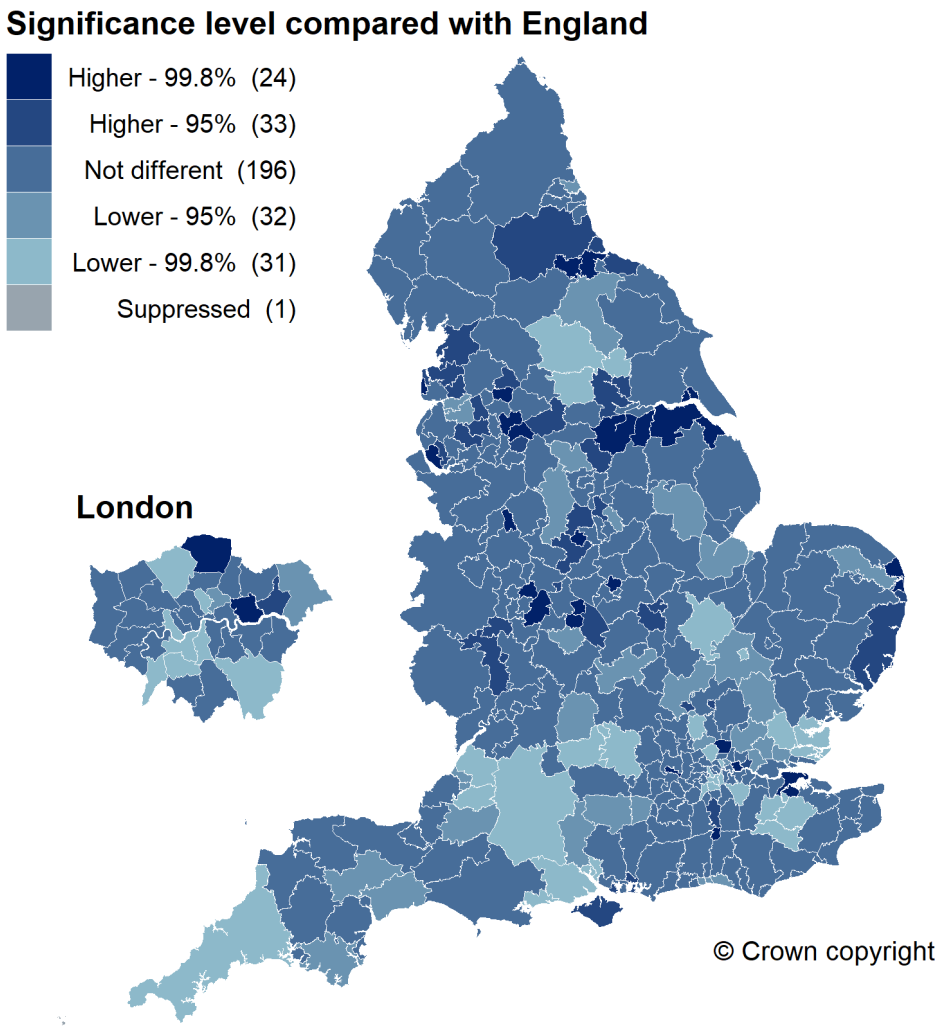
Type of unit		Number of eligible babies
NICU	Neonatal Intensive Care Unit	3,734
LNU	Local Neonatal Unit	3,078
SCU	Special Care Unit	639
All units		**7,451**

[20] Healthcare Quality Improvement Partnership (HQIP) Royal College of Paediatrics and Child Health (RCPCH) National Neonatal Audit Programme (NNAP) online [Accessed 09 Aug 2021]

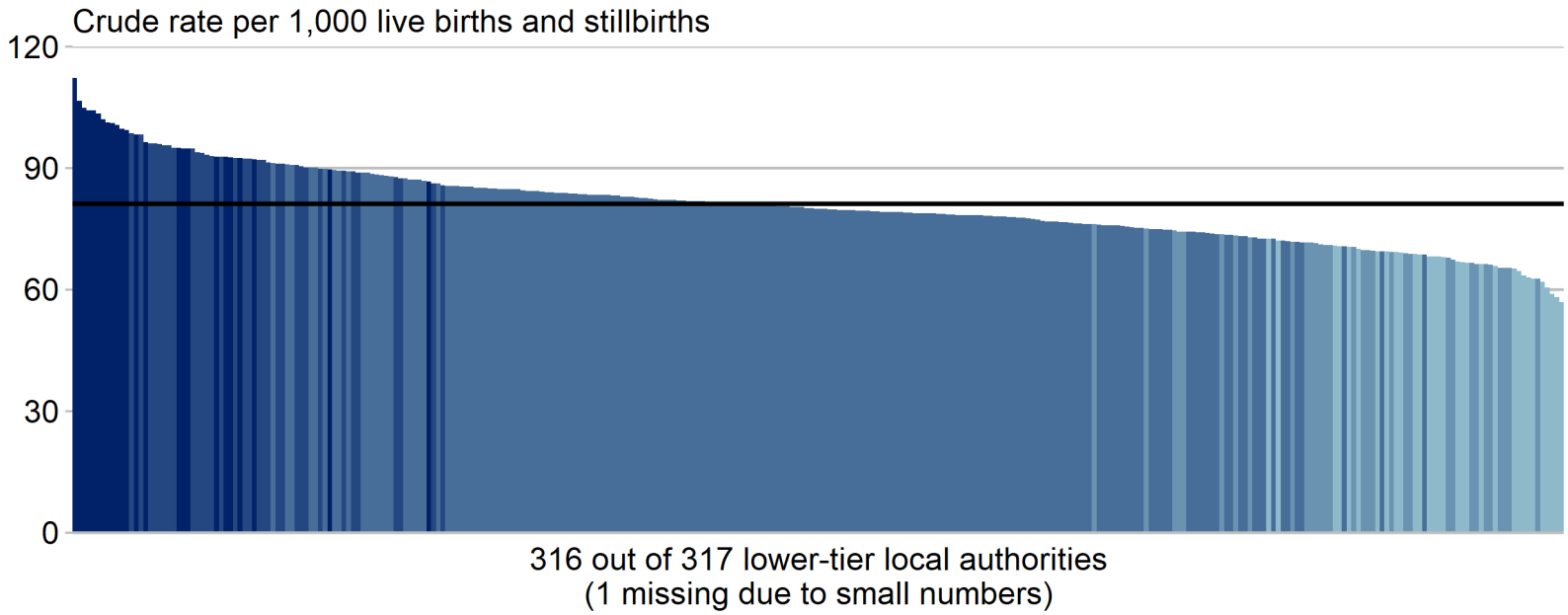
Map 15a: Variation in rate of premature live births (less than 37 weeks gestation) and all stillbirths by lower-tier local authority (2016-18)

Crude rate per 1,000 live births and stillbirths
Optimum value: Low

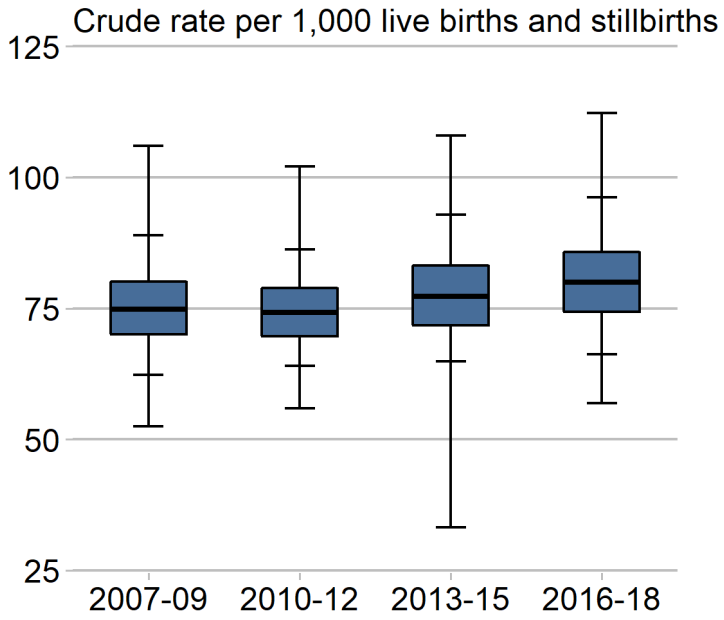




Column chart: Variation in rate of premature live births (less than 37 weeks gestation) and all stillbirths by lower-tier local authority (2016-18)



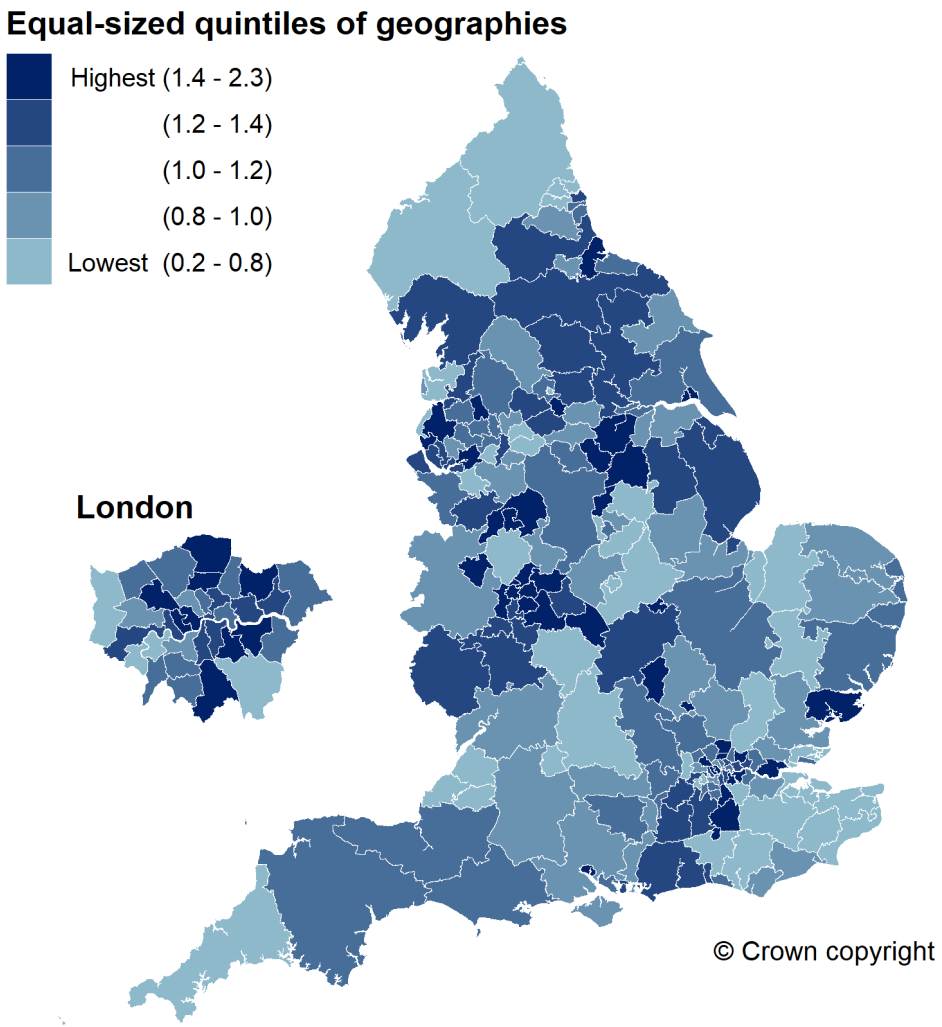
Box plot time series: Variation in rate of premature live births (less than 37 weeks gestation) and all stillbirths by lower-tier local authority (2007-09 to 2016-18)

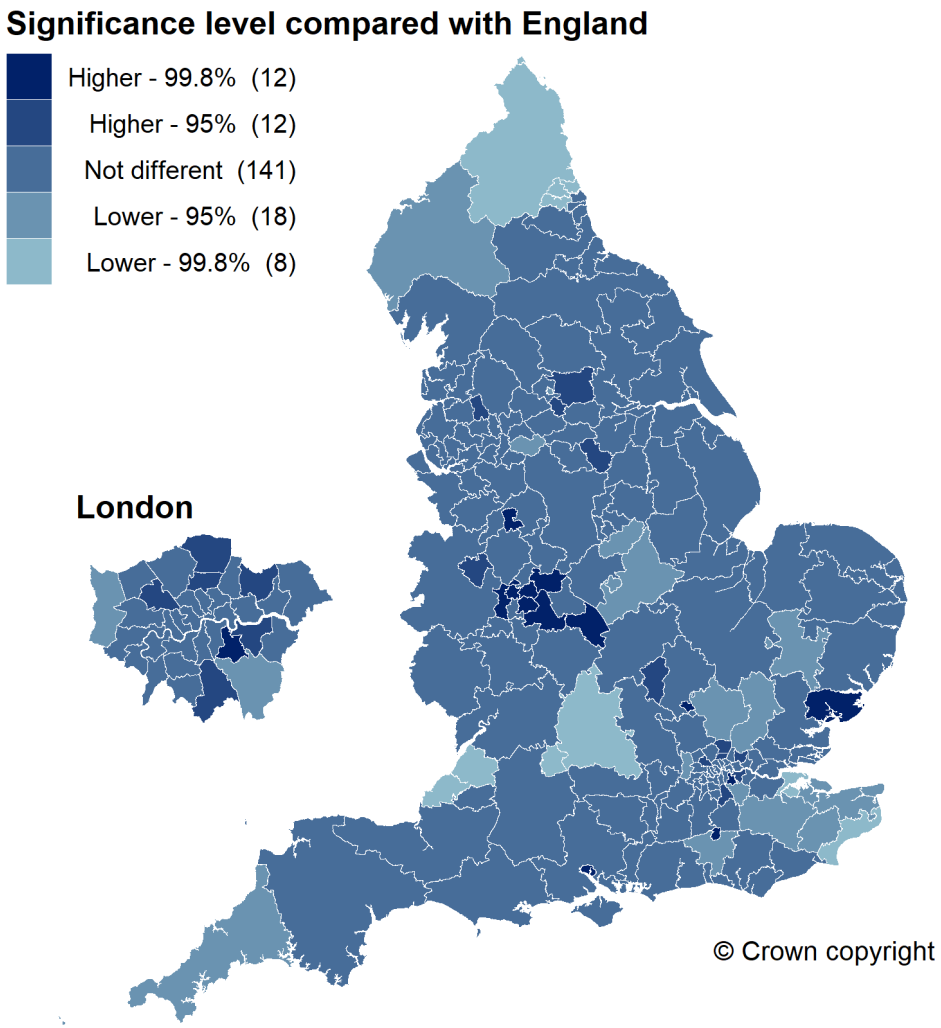


Year	2007-09	2010-12	2013-15	2016-18	
Max-Min (Range)	53.5	46.1	74.7	55.4	No significant change
75th-25th percentile	10.0	9.1	11.4	11.4	No significant change
95th-5th percentile	26.6	22.3	28.0	29.9	No significant change
Median	74.8	74.2	77.3	80.0	No significant change

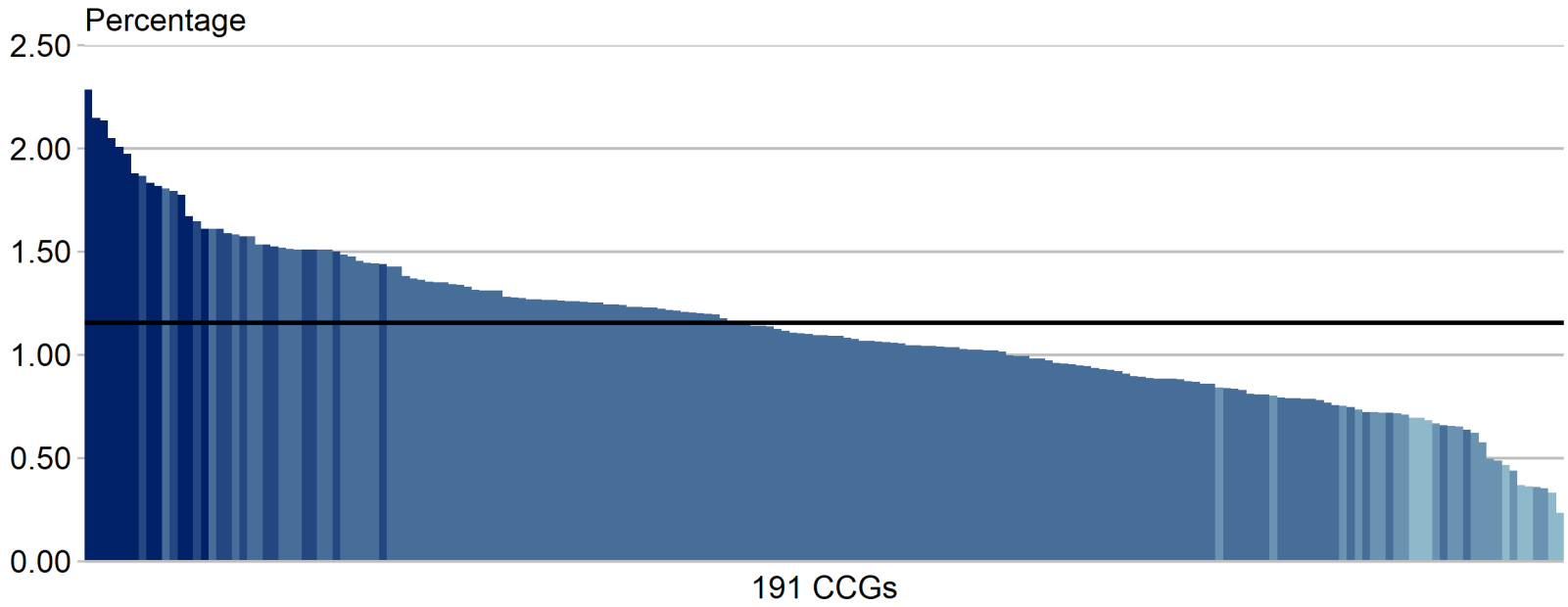
Map 15b: Variation in percentage of all births (live and stillbirths) with very low weight (under 1,500g) by clinical commissioning group (2018)

Optimum value: Low

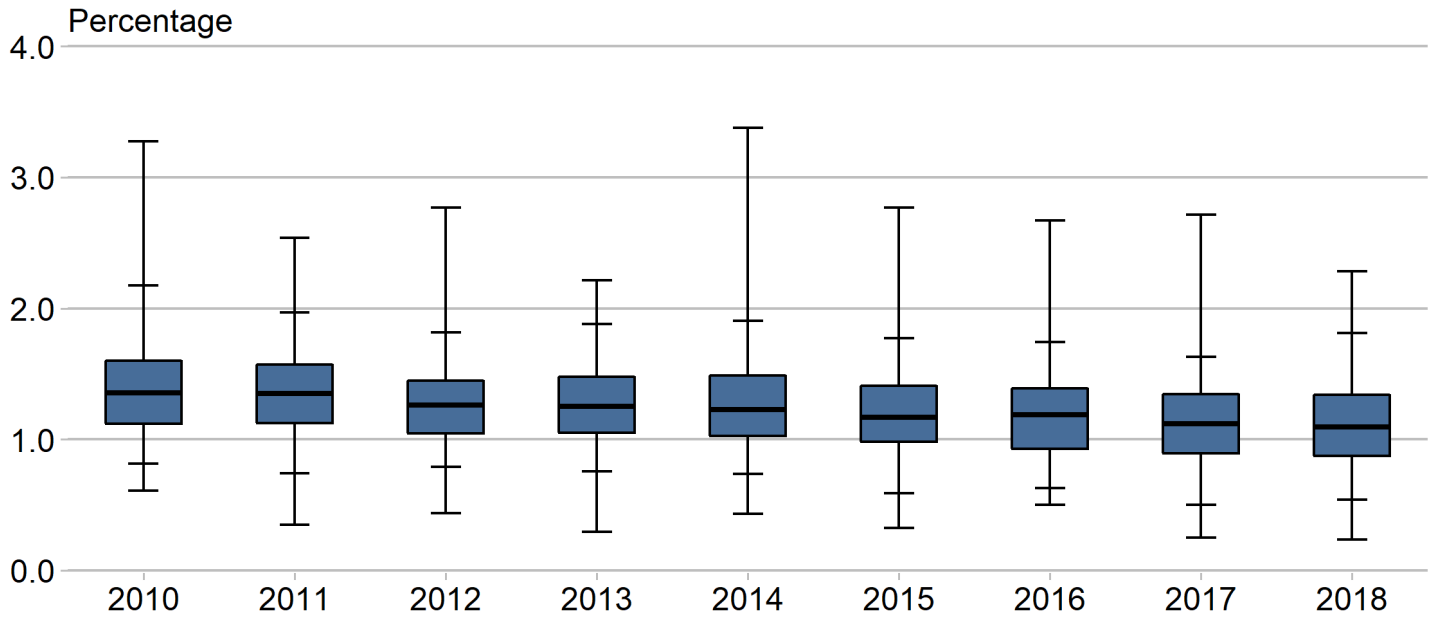




Column chart: Variation in percentage of all births (live and stillbirths) with very low weight (under 1,500g) by CCG (2018)



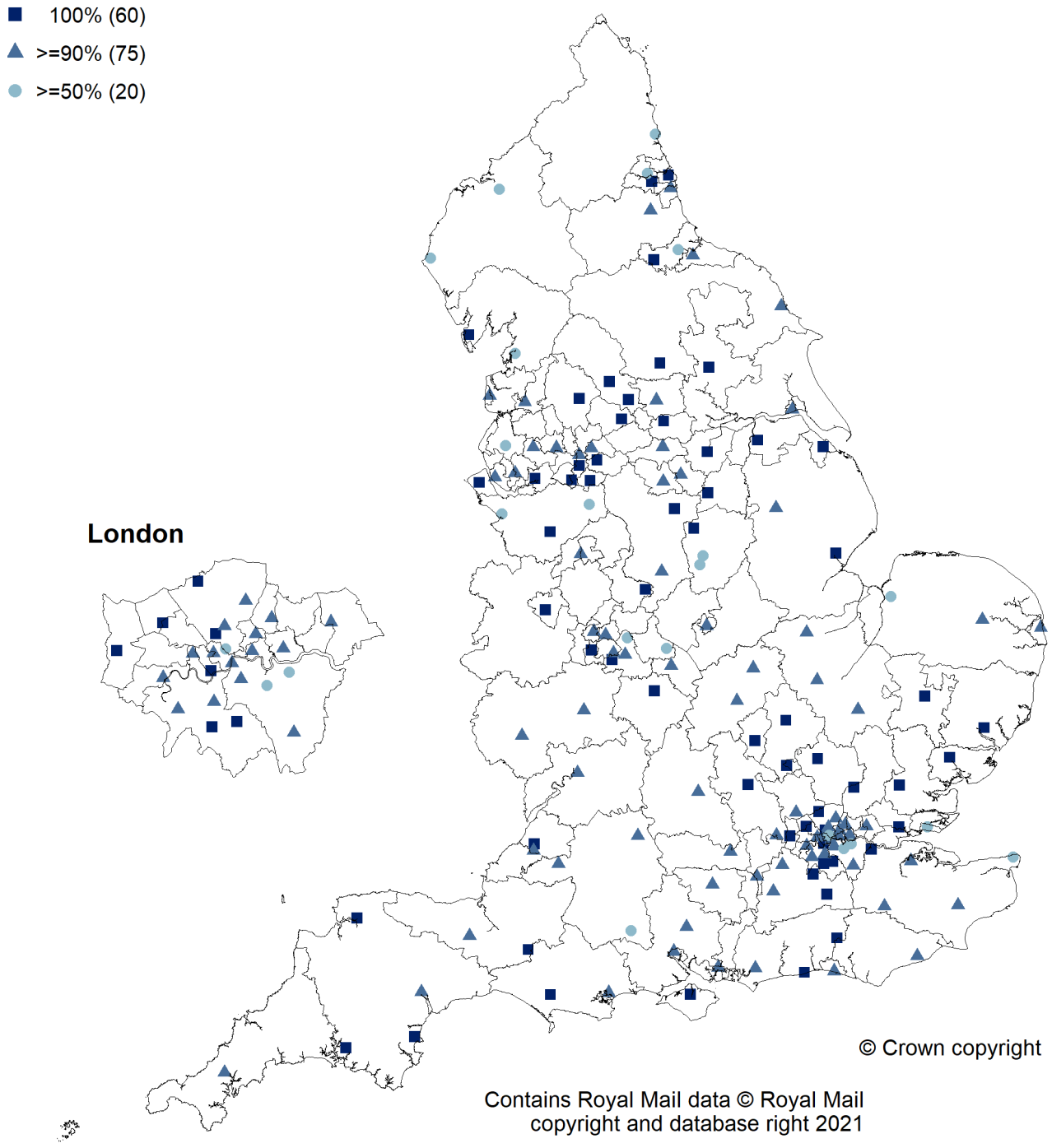
Box plot time series: Variation in percentage of all births (live and stillbirths) with very low weight (under 1,500g) by CCG (2010 to 2018)



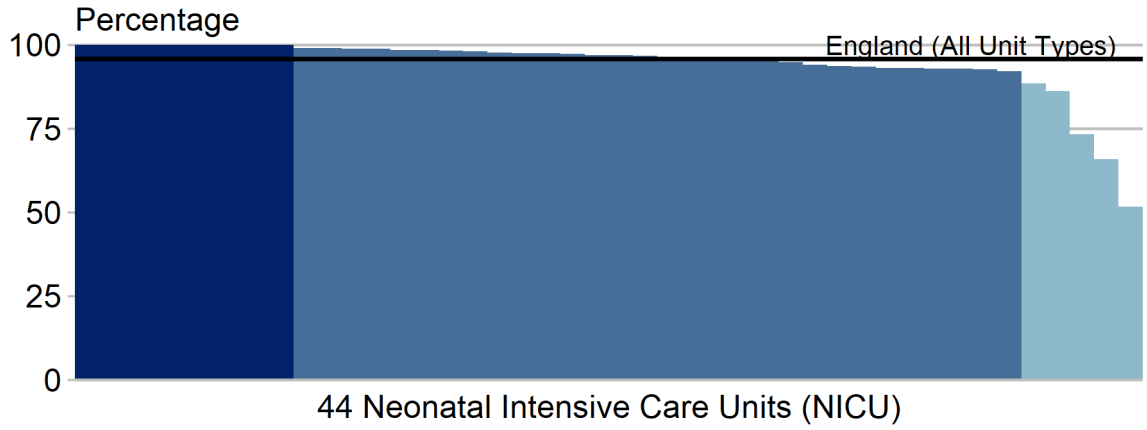
Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	
Max-Min (Range)	2.7	2.2	2.3	1.9	2.9	2.4	2.2	2.5	2.0	No significant change
75th-25th percentile	0.5	0.4	0.4	0.4	0.5	0.4	0.5	0.4	0.5	No significant change
95th-5th percentile	1.4	1.2	1.0	1.1	1.2	1.2	1.1	1.1	1.3	No significant change
Median	1.4	1.3	1.3	1.3	1.2	1.2	1.2	1.1	1.1	DECREASING Significant

Map 15c: Variation in percentage of eligible babies screened on-time for retinopathy of prematurity (ROP) by hospital unit (2019)

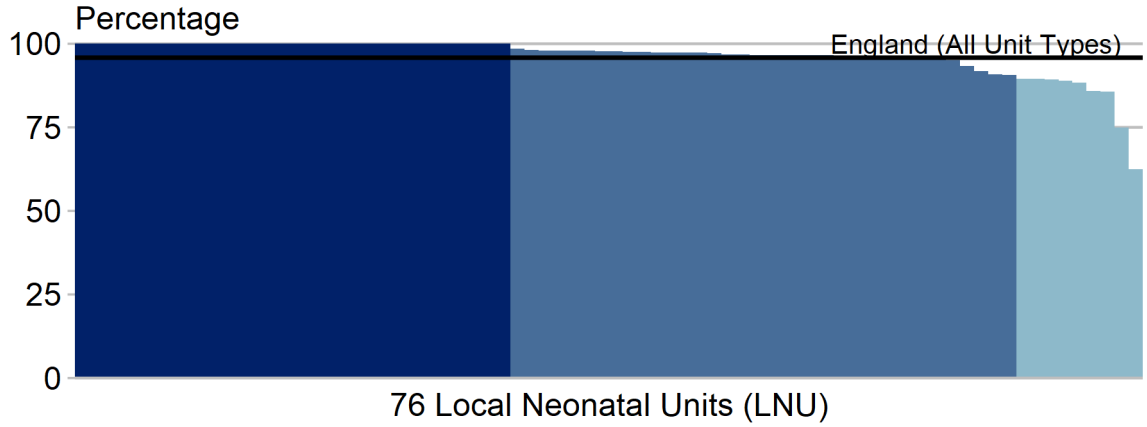
Optimum value: High



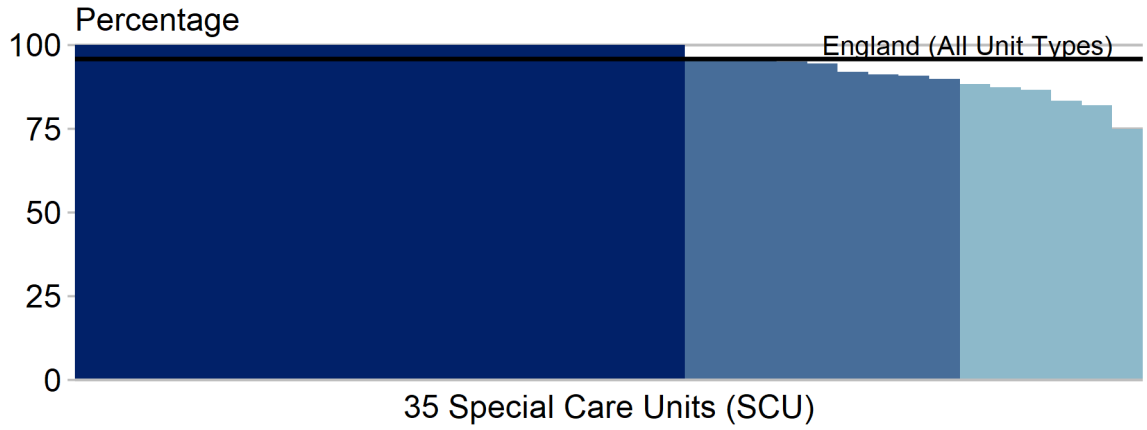
Column chart: Variation in percentage of eligible babies screened on-time for retinopathy of prematurity (ROP) by hospital unit (2019) - NICU



Column chart: Variation in percentage of eligible babies screened on-time for retinopathy of prematurity (ROP) by hospital unit (2019) - LNU



Column chart: Variation in percentage of eligible babies screened on-time for retinopathy of prematurity (ROP) by hospital unit (2019) - SCU



Magnitude of Variation

Map Eye15a: Variation in rate of premature live births (less than 37 weeks gestation) and all stillbirths by lower-tier local authority

The maps and column chart display the latest period (2016-18), during which lower-tier local authority values ranged from 56.9 per 1,000 live births and stillbirths to 112.2 per 1,000 live births and stillbirths, which is a 2.0-fold difference between lower-tier local authorities.

The England value for 2016-18 was 81.2 per 1,000 live births and stillbirths.

The box plot shows the distribution of lower-tier local authority values for the period 2007-09 to 2016-18.

According to these data rates of premature birth before 37 weeks have remained relatively steady between 2007-09 and 2016-18. Differences between local areas of up to double the rate of preterm birth may be due to many factors, such as antenatal care, the prevalence of local risk factors for premature delivery such as cigarette smoking[21] and transfer of expectant mothers to tertiary centres prior to preterm delivery. Without further breakdown by gestational age at birth it is not possible to determine whether the distribution of extremely preterm and moderately preterm deliveries has changed, or whether it is extremely preterm or moderate preterm births that account for the national variation.

As children born on or after 32 weeks will rarely require ROP screening it is difficult to ascertain whether or not there has been a rise in requirement for ROP screening or whether this is required to a greater extent in those locations with higher rates of preterm birth less than 37 weeks.

Map 15b: Variation in percentage of all births (live and stillbirths) with very low weight (under 1,500g) by clinical commissioning group

The maps and column chart display the latest period (2018), during which clinical commissioning group (CCG) values ranged from 0.2% to 2.3%, which is a 9.7-fold difference between CCGs.

The England value for 2018 was 1.2%.

The box plot shows the distribution of CCG values for the period 2010 to 2018.

[21] Chiriboga CA (2003) Fetal Alcohol and Drug Effects The Neurologist: Nov 2003 volume 9 Issue 6 p 267-279 [Accessed 04 May 2021]

The median decreased significantly from 1.4% in 2010 to 1.1% in 2018.

According to these data rates of infants born at very low birth weight have decreased slightly between 2010 and 2018. National variation is vast with the most affected areas experiencing almost ten-fold the rate of low birth weight deliveries experienced by the least affected locations. As with premature birth, reasons for variation may include differences in antenatal care, the prevalence of local risk factors for low birth weight, and transfer of high-risk expectant mothers to tertiary centres prior to delivery.

Map 15c: Variation in percentage of eligible babies screened on-time for retinopathy of prematurity (ROP) by hospital unit

The maps and column chart display the latest period (2019), during which hospital unit values ranged from 51.8% to 100%, which is a 1.9-fold difference between hospitals.

The England value for 2019 was 95.8%, and the median was 97.7%.

The three charts show the variation across different types of care unit.

The NICU values ranged from 51.8% to 100%, which is a 1.9-fold difference. The median was 97.0%.

The LNU values ranged from 62.5% to 100%, which is a 1.6-fold difference. The median was 97.8%.

The SCU values ranged from 75.0% to 100%, which is a 1.3-fold difference. The median was 100%.

There is clear guidance on the practice of ROP screening in premature or low birth weight infants. However, there is a concerning amount of variation between centres. The high median rates of timely screening indicate that while many centres are achieving around 100% timely screening of eligible infants others are dramatic outliers, with some only meeting the criteria in half of babies. There are both large and small units achieving 100% compliance. Where screening is delayed this may involve babies who are healthy enough to be discharged home prior to starting screening, or may relate to the availability of ophthalmic staff, particularly in smaller units. Movement between units due to a ‘step down’ in care requirements may also play a part. The degree of delay is not clear from the data and these findings require further exploration.

ROP screening is a highly skilled procedure usually performed by an experienced paediatric ophthalmologist. In serious cases delayed diagnosis and treatment may result in blindness. It is unclear from these data whether those who are not screened within the recommended timeframe are higher or lower risk for severe ROP, for example the

highest risk babies are usually those born earliest, or at the lowest birth weights. One potential explanation for delays in screening or failure to screen eligible infants is failure to coordinate care, for example when babies are transferred back to local services, or when babies are undergoing surgery or investigations that mean they are away from the ward when the ophthalmic teams visit. Healthier babies may be discharged home prior to ophthalmic screening and then may be missed by outpatient services. A second possibility is that hospitals with very few premature deliveries, or those located in rural areas may not have local access to ophthalmic services and so rely on ophthalmic visits which may be sporadic. If extremely premature birth is unusual, awareness of the ROP guidance may be limited. In some cases a single ophthalmologist is responsible for all screening within a region and so sickness or holiday may result in gaps in service delivery.

Options for action

Support is needed for areas where the paediatric ophthalmic service is sparse or understaffed. These data further support previous proposals to discuss whether there is a role for technicians or nursing staff in obtaining images for telemedicine review.[22] A review of current practice in areas where screening and treatment are timely and where parent satisfaction is high would be helpful in guiding such a project.

Service planning would also be aided by coordinated, detailed, freely available electronic data relating to premature births and ROP screening and treatment.

Resources

Bliss for babies born premature or sick [Accessed 23 Nov 2020]

Royal College of Ophthalmologists & Royal College of Paediatrics and Child Health (2008) Guideline for the Screening and Treatment of Retinopathy of Prematurity [Accessed 23 Nov 2020]

UK National Screening Committee (2019) The UK NSC recommendation on Vision defects screening in children [Accessed 23 Nov 2020]

[22] Campbell JP, Mathenge C, Cherwek H and others (2021) Artificial Intelligence to Reduce Ocular Health Disparities: Moving From Concept to Implementation Translational Vision Science & Technology 2021 Mar;10(3):19

Learning disabilities

Context

There are estimated to be 1.2 million people in England with a learning disability.[1] Adults with learning disabilities are 10 times more likely to have serious sight problems than other adults, and children are 28 times more likely.[2] Six in 10 people with learning disabilities need spectacles and often need support to feel comfortable to wear them.[3] They can benefit from spectacles, surgery, low vision aids and certificate of vision impairment (CVI) to support their activities of daily living. The 2013 Confidential Inquiry into premature deaths of people with learning disabilities (CIPOLD) report documented that 50% of adults with a learning disability who died prematurely had a vision problem.[4]

Vision impairment is an even greater problem in those with profound and multiple learning disabilities. They may not know they have a sight problem and may not be able to communicate this to people who care for them such as supporters, carers and teachers. It has been recommended that individuals in this group should be considered visually impaired unless proven otherwise.[5] Good eye care helps people to live healthier, more active and independent lives. With the right support, sight tests can be done for people with any level of disability.

A person with learning disabilities has a significantly reduced ability to understand new or complex information and to learn new skills, and a reduced capacity to cope independently. Many people with learning disability have more than one diagnosis, and in some cases the cause is not known. The major causes of learning disability in the UK are:

- preterm birth
- cerebral palsy
- Down's syndrome
- fragile-X syndrome
- genetic disorders
- metabolic disorders[6]

[1] MENCAP How common is learning disability? [Accessed 09 Jul 21]
[2] Public Health England (2020) Eye care and people with learning disabilities: making reasonable adjustments [Accessed 14 Jun 2021]
[3] Emerson E, Robertson J (2011) Estimated prevalence of visual impairment among people with learning disabilities in the UK Royal National Institute of Blind People (RNIB) and SeeAbility Learning Disabilities Observatory [Accessed 25 Jun 2021]
[4] University of Bristol (2013) Confidential Inquiry into premature deaths of people with learning disabilities (CIPOLD) Full final report [Accessed 16 Jul 2021]
[5] van Splunder J, Stilma J, Bernsen R and others (2006) Prevalence of visual impairment in adults with intellectual disabilities in the Netherlands: cross-sectional study Eye Sep;20(9):1004-10 [Accessed 16 Jul 2021]
[6] Royal College of Ophthalmologists (2015) Eye care services for adults with learning disabilities [Accessed 08 Jul 2021]

Vision Impairment comprises ocular visual impairment: abnormal function of the eye; and cerebral visual impairment: dysfunction of the complex processing pathways in the brain which interprets the image received by the eye. Patients with cerebral visual impairment may have normal visual acuity but a spectrum of dysfunction relating to visual search, visual attention, visual guided movement and/or visual recognition (places, faces, objects). The reported rates of cerebral visual impairment in prematurity, cerebral palsy[7] and Down's syndrome are between 20 and 50%.[8]

The sight problems that people with learning disabilities experience can include:

- refractive error
- cataract
- visual processing problems or cerebral visual impairment
- eye movement disorders including squint and nystagmus
- keratoconus
- optic nerve anomalies

The prevalence of autism spectrum disorder (ASD) is reported as around 1% of the UK population. Although not a cause of learning disability, around half of people with ASD also have a learning disability.[1] People with ASD are not included in the presented indicators unless they have a learning disability.

The recent British Childhood Visual Impairment Study 2 (BCVIS)[9] published findings indicating that almost half of all visual impairment in children is due to cerebral visual impairment. Seventy-two per cent of children with visual impairment have non-ocular morbidity most commonly associated with developmental delay. It has been demonstrated that documentation of vision impairment is omitted within a child's education, health and care plan (EHCP) for many children with complex needs and the impact of visual dysfunction on the child's ability to access education is overlooked.[10]

Recognising visual impairment in people with learning disabilities can be difficult as there may be impaired communication abilities present. Some behaviours have been associated with sight loss in people with learning disabilities, these include:

- anxiety in unfamiliar situations
- unwillingness to venture out of their immediate environment
- hesitancy on steps, at pavement edges or in poorly lit areas
- depression

[7] National Institute for Health and Care Excellence (2019) Cerebral palsy: What are the complications and comorbidities? [Accessed 16 Jul 2021]
[8] Wilton G J, Woodhouse R, Vinueala-navarro V and others (2021) Behavioural features of cerebral visual impairment are common in children with Down's syndrome Frontiers in Human Neuroscience 2021 Jun;15: 673342 [Accessed 16 Jul 2021]
[9] Teoh LJ, Solebo AL, Rahi JS (2021) Visual impairment, severe visual impairment, and blindness in children in Britain (BCVIS2): a national observational study Lancet Child Adolesc Health. 2021 Mar;5(3):190-200 [Accessed 16 Jul 2021]
[10] Donaldson LA, Karas M, O'Brien D and others (2019) Findings from an opt-in eye examination service in English special schools. Is vision screening effective for this population? PLoS ONE 14(3): e0212733 [Accessed 16 Jul 2021]

- anger or frustration
- eye poking or rubbing
- reduction in social or domestic skills in participation
- loss of interest in family, friends, TV or social activities
- undue alarm at unfamiliar noises or when approached
- self injurious behaviour[11]

Vision screening is recommended for children at age 4 to 5 years and takes place in mainstream schools in most regions. However, not all healthcare regions fund the programme outside mainstream schools. A framework for provision of eye care in special schools, to address this healthcare inequality, was therefore proposed in 2016.[12] While acknowledging that some areas may have a vision screening programme at school entry[13] the framework does not recommend screening as a tool for the special school population. Instead, the framework recommends that children in special schools should follow a pathway which includes a prescribed list of vision tests (outlined in section 6.4 and in the flowchart in appendix D of the framework).[12] This pathway is now being rolled out in special schools.[13,14]

Children with more severe or profound and multiple learning disabilities are more likely to attend a special school than their counterparts with mild or moderate learning disabilities.[15] A study in Bradford showed that a third of children in special schools who had never attended the relevant eye clinics would be considered visually impaired under the World Health Organisation (WHO) classification of visual impairment.[16] Moreover a further study has found that most children in special schools would fail the standard vision screen test.[10]

There is also evidence that significant barriers also exist for adults. Studies have shown only 50% of adults with a learning disability who attended a sight test reported having previously had a sight test within the 2 year recommended period for adults of working

[11] Cooper SA, Smiley E, Allan LM and others (2009) Adults with intellectual disabilities: prevalence, incidence and remission of self-injurious behaviour, and related factors J Intellect Disabil Res. 2009 Mar;53(3):200-216 [Accessed 16 Jul 2021]
[12] SeeAbility in association with the Association of British Dispensing Opticians, the British and Irish Orthoptic Society, the College of Optometrists, the Local Optical Committee Support Unit (LOCSU) and the Royal College of Ophthalmologists (2016) Framework for provision of eye care in special schools in England [Accessed 18 Jun 2021]
[13] Public Health England (2019) Child vision screening: Service specification [Accessed 21 Jul 2021]
[14] SeeAbility NHS England's Special School Eye Care Service [Accessed 16 Jun 2021]
[15] Public Health England (2020) People with learning disabilities in England Chapter 1: education and children's social care [Accessed 11 Jun 2021]
[16] Pilling RF, Outhwaite L (2017) Are all children with visual impairment known to the eye clinic? Br J Ophthalmol. 2017 Apr;101(4):472-474 [Accessed 16 Jul 2021]

age.[17,18] This is strikingly low as the GP annual learning disabilities health check includes a prompt to review whether patients have had a sight test.

Barriers can include:

- assumptions - that it is not possible to have a sight test for someone who does not speak or read
- awareness - that people with learning disabilities are more likely to have vision problems, and less likely to be able to communicate a problem
- overshadowing - that changes in behaviour or a reduction in function may be due to vision rather than the person's learning disability
- misguided kindness - that a carer believes it would be too difficult for the patient, or cause them distress to have an eye test

It is a statutory requirement under the Equality Act 2010[19] and the NHS and Social Care Act 2008[20] that public sector agencies make reasonable adjustments to their practice, so these patients are not disadvantaged in both access and outcomes for treatment. Additionally, all organisations that provide NHS or adult social care must follow the NHS England Accessible Information Standard.[21]

For healthcare professionals, there is a paucity of data on outcomes of interventions for adults with learning disabilities and eye problems, leading to difficulties in decision making and establishing best interests. There is little data collected on access to eye care by people with learning disabilities, which also hampers understanding of the eye health outcomes they experience at a local or national level. The impact of deteriorating and restoring vision in patients on their caring needs and quality of life is under researched and a likely contributory factor in the cautious approach taken during surgical decision making.

Access to screening services, including diabetic eye screening programme, has been shown to be reduced for adults with learning disability, although they are at higher risk of developing sight threatening complications.[22]

Improvements in neonatal and paediatric care over the past 2 decades has resulted in longer life expectancies for children born with neurological, developmental and

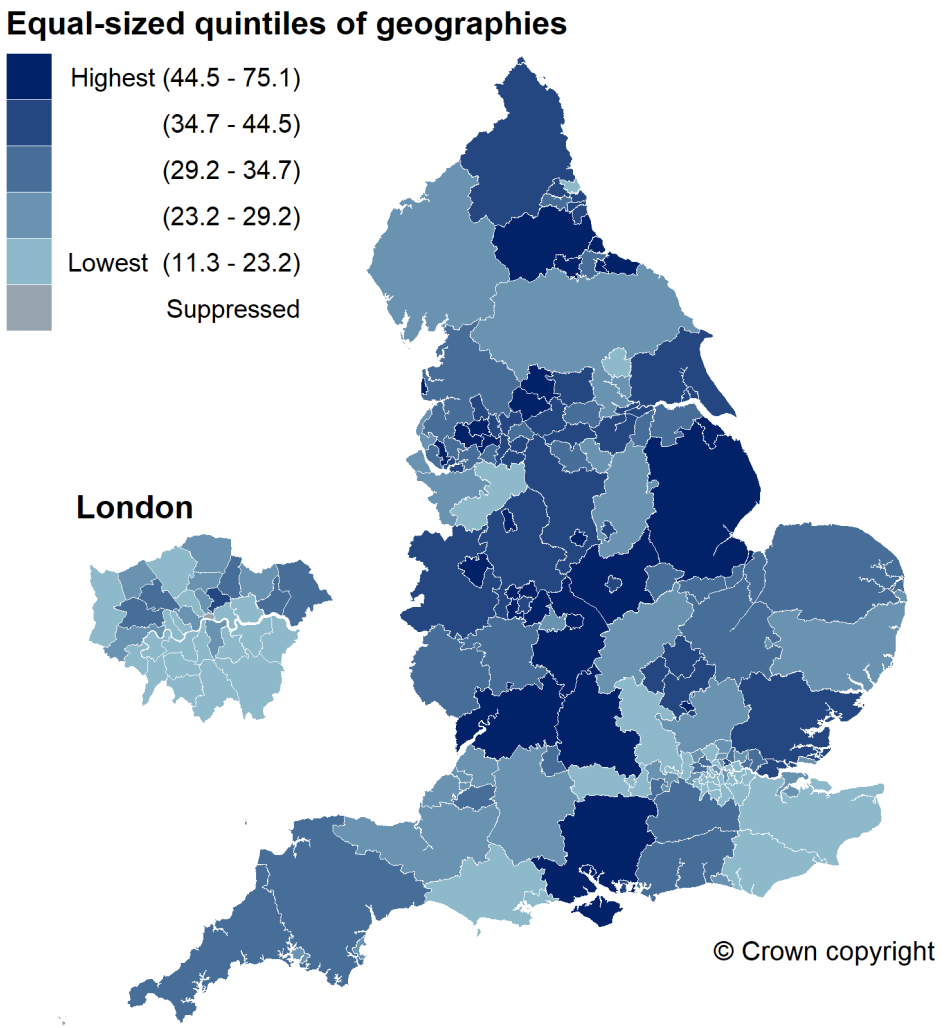
[17] SeeAbility (2015) Pilot of the LOCSU Community Eye Care Pathway for Adults and Young People with Learning Disabilities in the Tri-Borough area of Kensington and Chelsea, Hammersmith and Fulham and Westminster [Accessed 16 Jul 2021]
[18] Wessex Voices (2020) Improving Eye Care in Wessex [Accessed 16 Jul 2021]
[19] UK Government (2010) Equality Act 2010 [Accessed 16 Jun 2021]
[20] UK Government (2008) Health and Social Care Act 2008 [Accessed 16 Jul 2021]
[21] NHS England Accessible Information Standard [Accessed 16 Jun 2021]
[22] Pilling RF (2014) Screening for diabetic retinopathy in adults with learning disability: current uptake and adjustments to facilitate equality of access British Journal of Learning Disabilities 2014 Feb;43(1):62-65 [Accessed 16 Jul 2021]

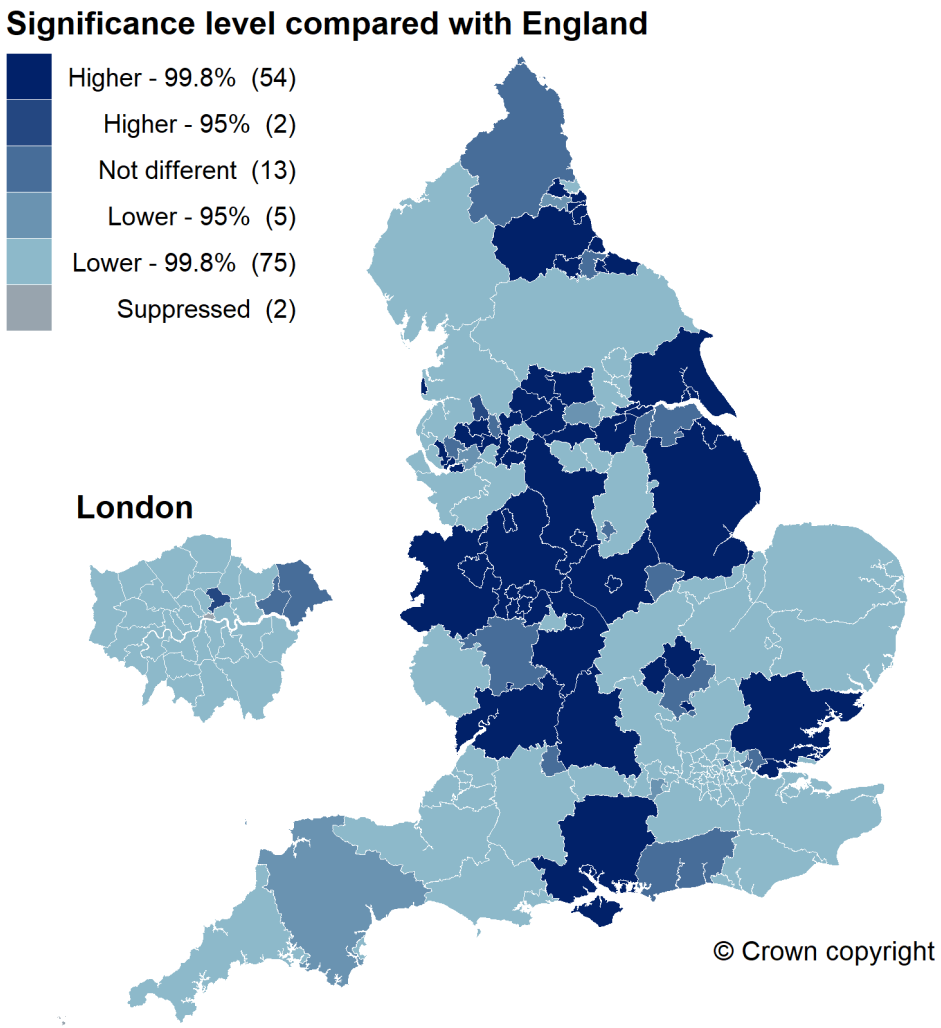
chromosomal abnormalities.[23] This is expected to lead to an increase in adults with learning disability presenting with glaucoma, cataract and macular degeneration. Without improving access to community and secondary care, a commensurate increase in preventable sight loss will occur.

[23] University of Bristol (2020) The Learning Disabilities Mortality Review (LeDeR) Programme Annual Report 2020 [Accessed 16 Jul 2021]

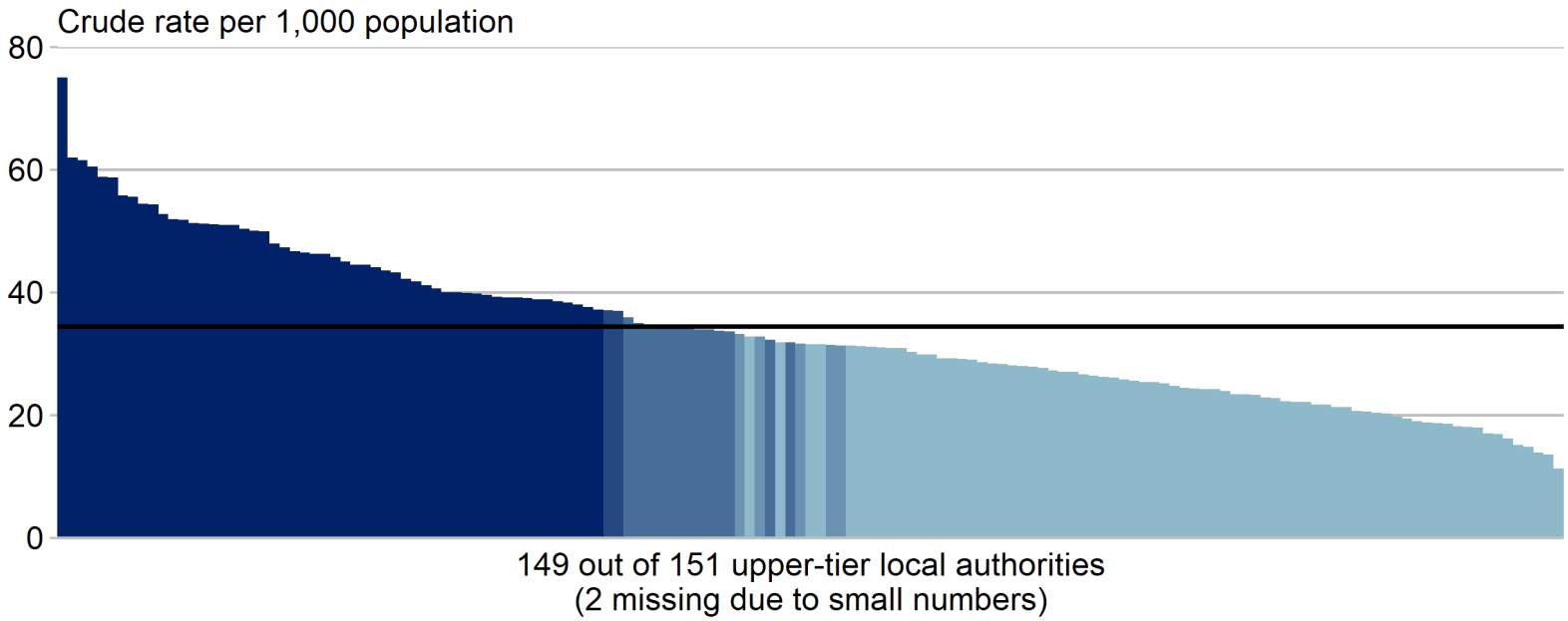
Map 16a: Variation in rate of children with learning difficulties known to schools by upper-tier local authority (2020)

Crude rate per 1,000 population
Optimum value: Requires local interpretation

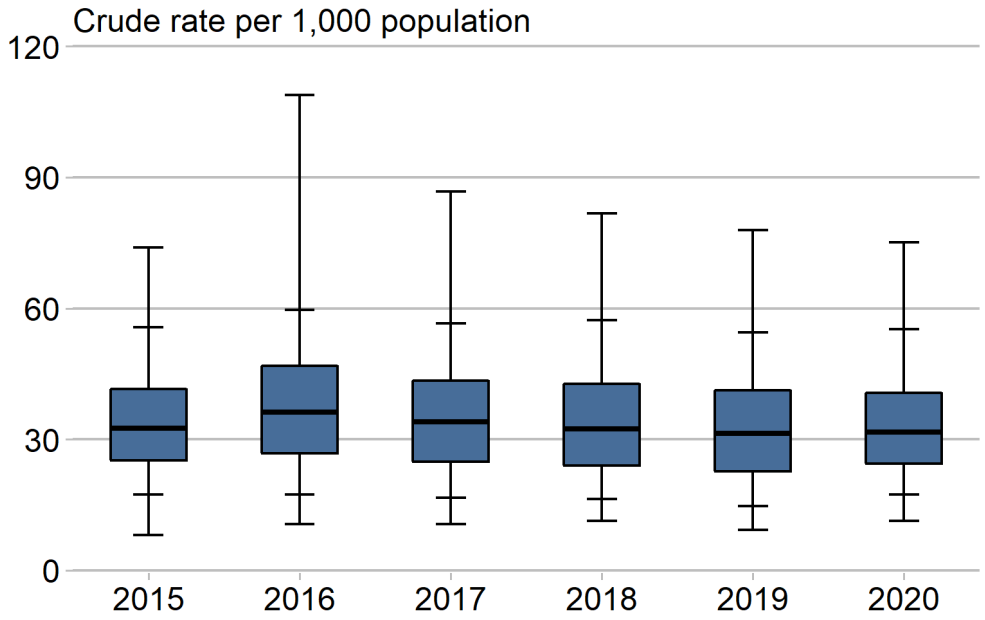




Column chart: Variation in rate of children with learning difficulties known to schools by upper-tier local authority (2020)



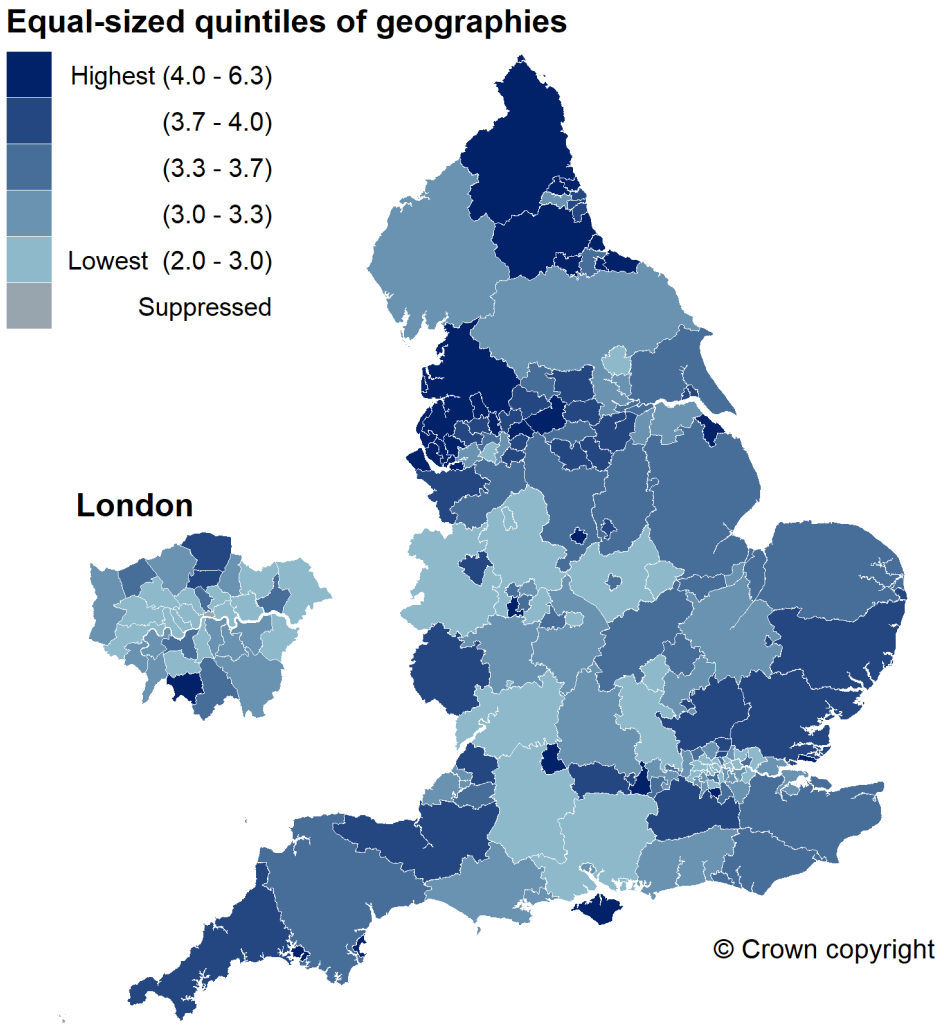
Box plot time series: Variation in rate of children with learning difficulties known to schools by upper-tier local authority (2015 to 2020)

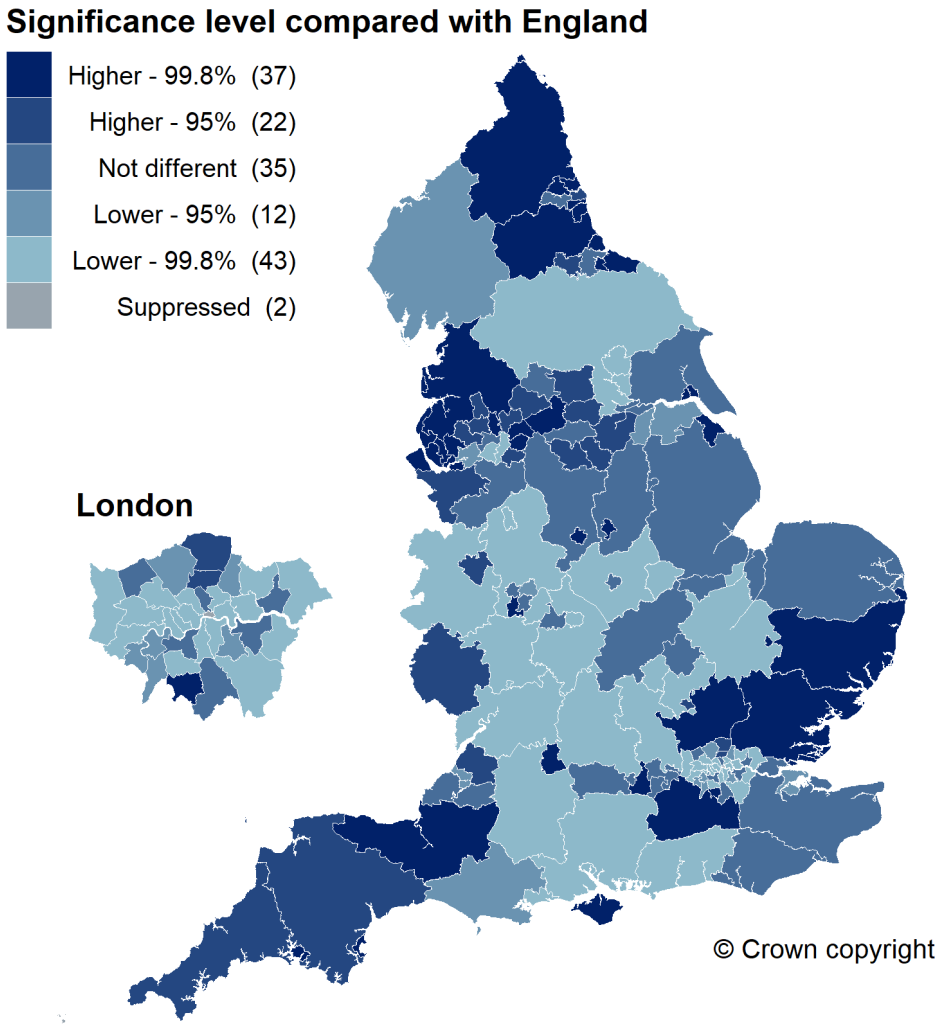


Year	2015	2016	2017	2018	2019	2020	
Max-Min (Range)	65.9	98.2	76.2	70.4	68.6	63.7	No significant change
75th-25th percentile	16.3	20.1	18.5	18.7	18.5	16.2	No significant change
95th-5th percentile	38.3	42.2	40.0	40.9	39.8	37.7	No significant change
Median	32.5	36.2	34.0	32.3	31.4	31.6	No significant change

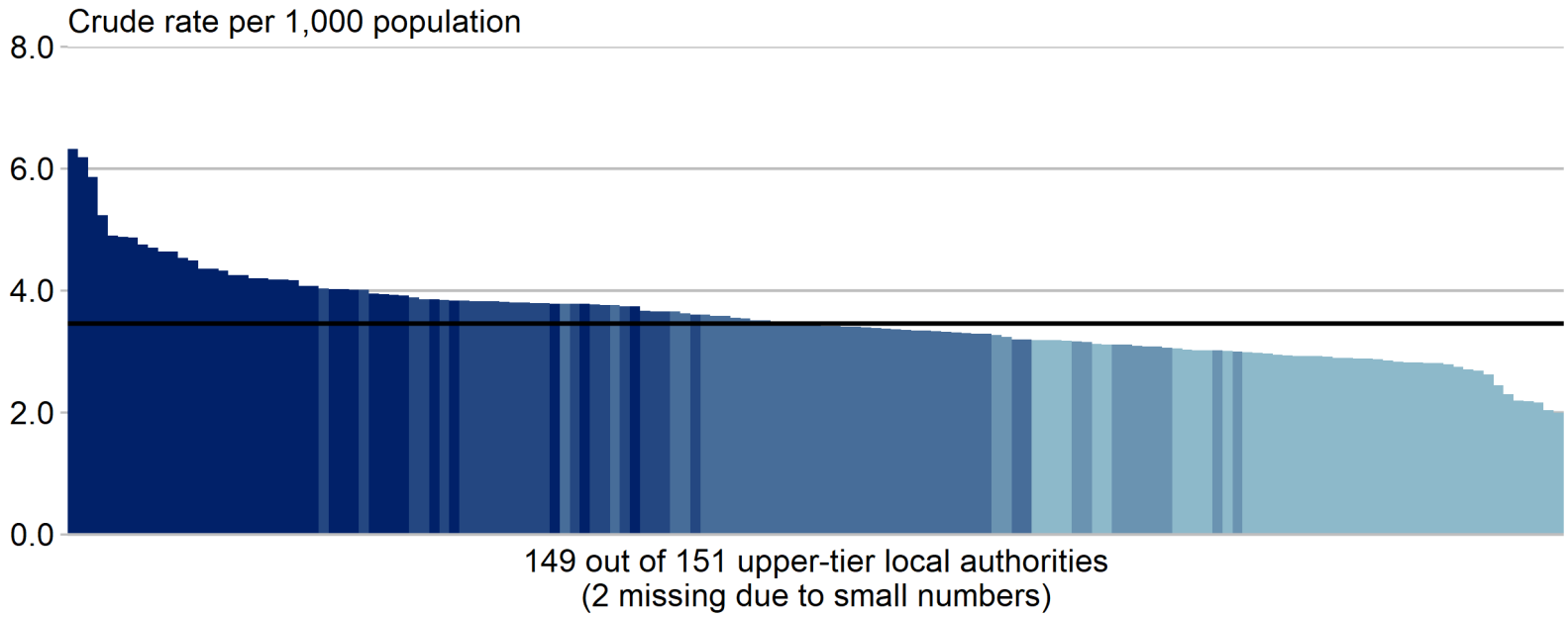
Map 16b: Variation in rate of people aged 18 years and over with a learning disability getting long-term support from local authorities by upper-tier local authority (2019/20)

Crude rate per 1,000 population
Optimum value: Requires local interpretation

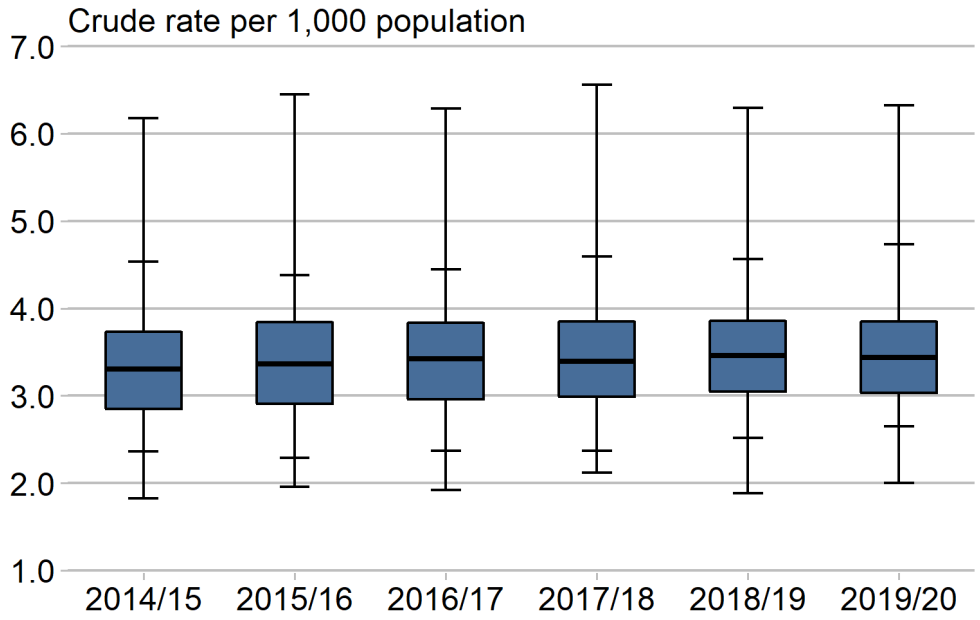




Column chart: Variation in rate of people aged 18 years and over with a learning disability getting long-term support from local authorities by upper-tier local authority (2019/20)



Box plot time series: Variation in rate of people aged 18 years and over with a learning disability getting long-term support from local authorities by upper-tier local authority (2014/15 to 2019/20)



Year	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	
Max-Min (Range)	4.4	4.5	4.4	4.4	4.4	4.3	No significant change
75th-25th percentile	0.9	0.9	0.9	0.9	0.8	0.8	NARROWING Significant
95th-5th percentile	2.2	2.1	2.1	2.2	2.0	2.1	No significant change
Median	3.3	3.4	3.4	3.4	3.5	3.4	INCREASING Significant

Magnitude of Variation

Map 16a: Variation in rate of children with learning difficulties known to schools by upper-tier local authority

The maps and column chart display the latest period (2020), during which upper-tier local authority values ranged from 11.3 per 1,000 population to 75.1 per 1,000 population, which is a 6.6-fold difference between upper-tier local authorities.

The England value for 2020 was 34.4 per 1,000 population.

The box plot shows the distribution of upper-tier local authority values for the period 2015 to 2020.

There is extensive geographical variation in the rate of children with learning disabilities who are known to schools. This could suggest that there is variation in the rate of children with learning disabilities in different upper-tier local authorities, which could be due to socioeconomic and demographic factors. It could also suggest variation in the abilities of local authorities to assess pupils' needs or identify when a learning disability is present. Differences in funding allocated to services within and between geographical areas may be both a cause and effect of this variation.

Map 16b: Variation in rate of people aged 18 years and over with a learning disability getting long-term support from local authorities by upper-tier local authority

The maps and column chart display the latest period (2019/20), during which upper-tier local authority values ranged from 2.0 per 1,000 population to 6.3 per 1,000 population, which is a 3.2-fold difference between upper-tier local authorities.

The England value for 2019/20 was 3.5 per 1,000 population.

The box plot shows the distribution of upper-tier local authority values for the period 2014/15 to 2019/20.

The 75th to 25th percentile gap narrowed significantly.

The median increased significantly from 3.3 per 1,000 population in 2014/15 to 3.4 per 1,000 population in 2019/20.

There is substantial geographical variation in the rate of people aged 18 years and over with a learning disability receiving long-term support from local authorities. This variation

is seen in both the type of social care provided and expenditure.[24] The uneven distribution of social care provision stems from the fact that funding is not centrally controlled. Faced with competing demands for their limited resources, local authorities can make very different decisions about how they spend on social care provision.[25] It may also represent cultural differences in approach to family carers. There can also be substantial variation in numbers of people with learning disabilities accessing a GP learning disability annual health check[26] despite GPs being incentivised to provide targeted checks.

Options for action

Assessing if people with learning disability have a vision problem can be undertaken as a functional visual assessment, rather than using a standard chart. A functional visual assessment is useful in determining how the patient uses their vision day to day and establishes if there has been a change in visual function to support the diagnosis of onset of ocular pathology. Functional tools have been developed to assess adults with learning disability prior to cataract surgery,[27] and another example can be found on the SeeAbility website.[28] Employing the skills of an orthoptist, using forced choice preferential looking techniques or picture/letter matching tests, can also be useful. Other measures such as contrast sensitivity or the Bradford Visual Function Box[29] can be used to demonstrate reduction in visual function.

The current system of registration/certification for vision impairment refers clinicians to a visual acuity or visual field threshold. As many patients with learning disability are unable to participate in formal testing, some clinicians feel unable to certify a patient and this presents a barrier to accessing services. Changes in the form to allow functional visual impairment regardless of visual acuity, would be more inclusive.

A critical step to increasing awareness is the specific inclusion of eye conditions relating to children with special needs and adults with learning disability within professional curricula. Good professional practice guidance exists for ophthalmologists and

[24] Public Health England (2020) People with learning disabilities in England Chapter 5: adult social care [Accessed 16 Jul 2021]
[25] NHS Digital (2020) Adult Social Care Activity and Finance Report Adult Social Care Activity and Finance Report, England - 2019-20 [Accessed 11 Jun 2021]
[26] Public Health England (2020) People with learning disabilities in England Chapter 7: health checks [Accessed 16 Jul 2021]
[27] Rostron E, Rawse C and Pilling R (2018) Validation of VSLD questionnaire in patients with learning disabilities undergoing cataract surgery Eye 2018;32:833–834 [Accessed 20 Jul 2021]
[28] SeeAbility Functional Vision Assessment (FVA) [Accessed 16 Jul 2021]
[29] Pilling RF, Outhwaite L and Bruce A (2016) Assessing visual function in children with complex disabilities: the Bradford visual function box Br J Ophthalmol. 2016 Aug;100(8):1118-21 [Accessed 20 Jul 2021]

optometrists.[30,31] Case studies and examples of reasonable adjustments to facilitate access to eye care have been published by Public Health England in 2020.[2] A national scheme of mandatory training in learning disabilities across health and social care is planned for introduction in the future.[32]

Public Health information campaigns using peer to peer led community champions with learning disabilities, promoting accessible information and understanding of different aspects of eye care to this high risk group has also been recommended.[18]

Ophthalmologists should be proactive in identifying people with learning disability prior to clinic attendance so that preparation can be offered to the patient and the carer. Appendix B of the Eye Care for Adults with Learning Disabilities guidance from the Royal College of Ophthalmologists[31] includes a list of reasonable adjustments which could be considered for accessing the eye clinic. Appendix D[31] includes reasonable adjustments to facilitate successful diabetic retinopathy screening. Easy Read leaflets are available to help the patient prepare for an eye test so they might be better able to anticipate what will happen.[33] The Royal National Institute of Blind People (RNIB) have published advice on how to communicate with a person,[34] and how to manage the environment to improve services. They have also devised a list of questions which can be addressed to the patient or carer.[35] These reasonable adjustments are also applicable for people with ASD, especially where a learning disability is also present.

SeeAbility have an eye surgery support plan which can be used by hospital and community support teams to help plan surgery.[36] Initiatives such as Books Beyond Words[37] developed by and with people with learning disability can also support patients and carers in their decision making and preparation for eye surgery.

Ophthalmologists should be aware that people with learning disability may have a written health record that sets out how they prefer to be treated. It should be ensured that where possible, people with a learning disability are enabled to consent for themselves, as per the 2005 Mental Capacity Act.[38] People with a learning disability are vulnerable patients and should be exempt from Trust did not attend policies.

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[30] Royal College of Ophthalmologists (2015) Ophthalmic Services Guidance: Eye Care for Adults with Learning Disabilities [Accessed 16 Jul 2021]
[31] Royal College of Ophthalmologists (2015) Examining patients with learning disabilities [Accessed 16 Jul 2021]
[32] NHS Health Education England The Oliver McGowan Mandatory Training in Learning Disability and Autism [Accessed 16 Jul 2021]
[33] SeeAbility Having an eye test (easy read) [Accessed 16 Jul 2021]
[34] Royal National Institute of Blind People (RNIB) Learning disabilities [Accessed 16 Jul 2021]
[35] Royal National Institute of Blind People (RNIB) Learning Disability and Sight Loss [Accessed 16 Jul 2021]
[36] SeeAbility Eye Surgery Support Plan [Accessed 16 Jul 2021]
[37] Beyond Words Looking after my eyes Books [Accessed 16 Jul 2021]
[38] UK Government (2005) Mental Capacity Act 2005 [Accessed 16 Jun 2021]

The adoption of a learning disabilities eye care pathway, both pre appointment as well as during and after a sight test appointment, is recommended in areas where there are none commissioned. Improved funding to support longer appointment times can be allocated for the test and accessible information and support can be provided, for example to get support in wearing spectacles and have the results of the sight test explained in an easy read format.

The GP annual health check for people with learning disabilities[39] provides a further opportunity for patients to be prompted and encouraged to go for a regular sight test. Evidence that this leads to more patients accessing eye tests however is lacking.

Public Health England's service specification for the child vision screening programme[13] does not recommend screening for special schools, instead they recommend more comprehensive and regular eye care. A vision screen is not a full eye examination and does not pick up all eye conditions and so a full eye examination is recommended for children with learning disabilities. See the framework for proposed special schools service.[10]

It will require collaboration with secondary eye care to ensure children are offered hospital eye care, particularly for formal diagnosis with cerebral visual impairment and sight impairment certification where appropriate. NHS England is introducing a programme of eye care for special schools across England from 2021.[14] This programme will reach over 120,000 children and will address a range of unmet needs. Research in special schools in Northern Ireland has evidenced improvements in educational attainment when there is an in school eye care service.[40]

The Down's syndrome Society[41] have established a simple and robust surveillance protocol to ensure children are assessed at key stages of childhood to proactively detect vision problems. Similar approaches in those with prematurity, cerebral palsy and other common causes of ocular and cerebral visual impairment would promote prompt diagnosis and access to support in children who would otherwise be unable to express visual dysfunction.

Improvements in data collection for example in the diabetic eye screening programme, NHS sight test data, and in hospital eye care records, would allow more understanding of access and outcomes for these patients. Changes to NHS information technology infrastructure are being piloted and will allow for a digital flag to be provided for these patients so health professionals and services are alerted to the reasonable adjustments

[39] NHS Annual health checks Learning disabilities [Accessed 16 Jun 2021]
[40] Black SA, McConnell EL, McKerr L and others (2019) In-school eyecare in special education settings has measurable benefits for children's vision and behaviour PLoS ONE. 2019 Aug;14(8): e0220480 [Accessed 16 Jul 2021]
[41] Down's Syndrome Association Eyes [Accessed 16 Jun 2021]

patients with learning disabilities need.[42] The certificate of vision impairment has a mandatory field for clinicians to record the patient's cognitive status which will lead to improvements in data collection for prevalence of sight impairment and different sight impairing conditions in this population.[43]

Resources

Beyond Words Looking after my eyes Books [Accessed 16 Jul 2021]

Department of Health and Social Care (2018) Registering vision impairment as a disability Certificate of Vision Impairment (CVI) form and Referral of Vision Impairment (RVI) letter template for consultant ophthalmologists and hospital eye clinic staff [Accessed 16 Jul 2021]

Down's Syndrome Association Eyes [Accessed 16 Jun 2021]

General Medical Council Learning disabilities [Accessed 18 Jun 2021]

Improving Health and Lives: Learning Disabilities Observatory, Supported by the Department of Health (2014) The Estimated Prevalence of Visual Impairment among People with Learning Disabilities in the UK [Accessed 18 Jun 2021]

Local Optical Committee Support Unit (2020) Service pathway: Enhanced eye care for people with learning disabilities [Accessed 18 Jun 2021]

Pilling RF, Donaldson L, Karas M and others (2020) Referral thresholds for an integrated learning disability eye care pathway: a consensus approach Eye 2021 [Accessed 16 Jul 2021]

Pilling RF, Outhwaite L and Bruce A (2016) Assessing visual function in children with complex disabilities: the Bradford visual function box Br J Ophthalmol. 2016 Aug;100(8):1118-21 [Accessed 20 Jul 2021]

Public Health England (2020) Diabetic eye screening: easy read guide [Accessed 16 Jul 2021]

Public Health England (2020) Eye care and people with learning disabilities: making reasonable adjustments [Accessed 14 Jun 2021]

[42] NHS Digital Reasonable Adjustment Flag [Accessed 09 Aug 2021]
[43] Department of Health and Social Care (2018) Registering vision impairment as a disability Certificate of Vision Impairment (CVI) form and Referral of Vision Impairment (RVI) letter template for consultant ophthalmologists and hospital eye clinic staff [Accessed 16 Jul 2021]

Public Health England Learning Disability Profiles [Accessed 16 Jul 2021]

NHS Digital (2020) Adult Social Care Activity and Finance Report Adult Social Care Activity and Finance Report, England - 2019-20 [Accessed 11 Jun 2021]

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Royal National Institute of Blind People (RNIB) Learning disabilities [Accessed 16 Jul 2021]

Royal National Institute of Blind People (RNIB) Learning Disability and Sight Loss [Accessed 16 Jul 2021]

Royal National Institute of Blind People (RNIB) Healthy Eyes Helping adults with learning disabilities to recognise the signs of sight loss [Accessed 16 Jul 2021]

SeeAbility in association with the Association of British Dispensing Opticians, the British and Irish Orthoptic Society, the College of Optometrists, the Local Optical Committee Support Unit (LOCSU) and the Royal College of Ophthalmologists (2016) Framework for provision of eye care in special schools in England [Accessed 18 Jun 2021]

SeeAbility Eye care factsheets [Accessed 18 Jun 2021]

SeeAbility Eye care champions [Accessed 25 Jun 2021]

SeeAbility Eye Surgery Support Plan [Accessed 16 Jul 2021]

SeeAbility Having an eye test (easy read) [Accessed 16 Jul 2021]

SeeAbility NHS England's Special School Eye Care Service [Accessed 16 Jun 2021]

About Public Health England

Public Health England exists to protect and improve the nation's health and wellbeing, and reduce health inequalities. We do this through world-leading science, research, knowledge and intelligence, advocacy, partnerships and the delivery of specialist public health services. We are an executive agency of the Department of Health and Social Care, and a distinct delivery organisation with operational autonomy. We provide government, local government, the NHS, Parliament, industry and the public with evidence-based professional, scientific and delivery expertise and support.

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