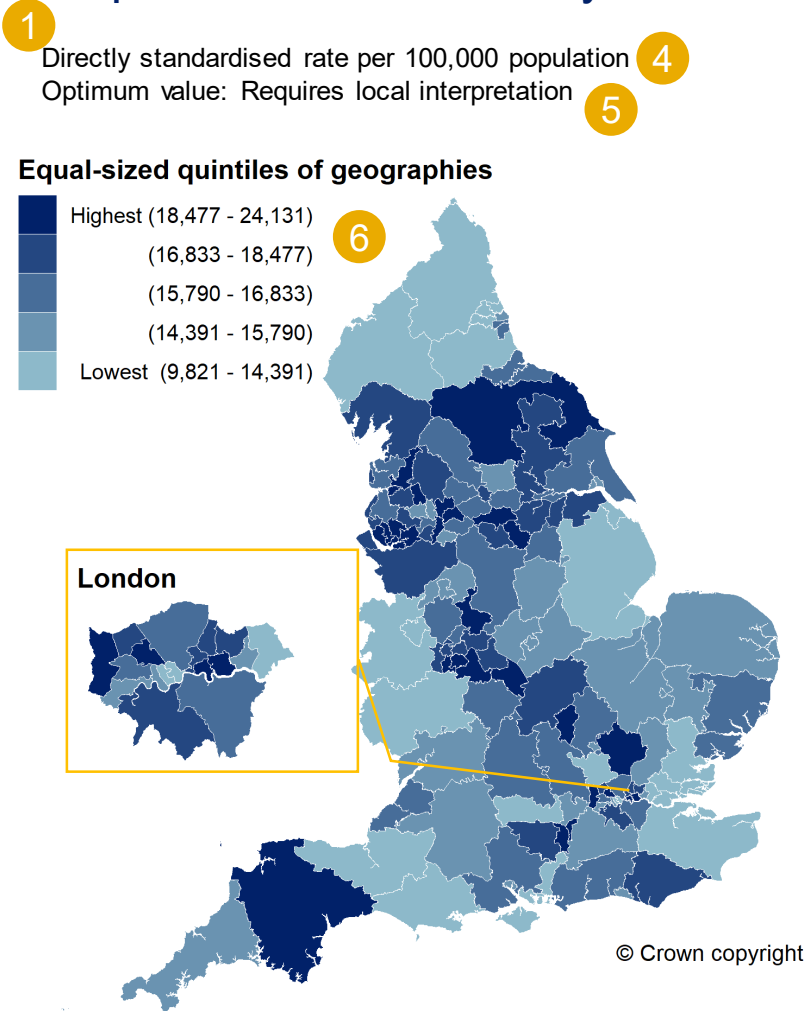


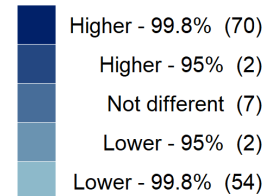
## Maps

- 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)



#### Significance level compared with England



## Quick user guide

- 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.

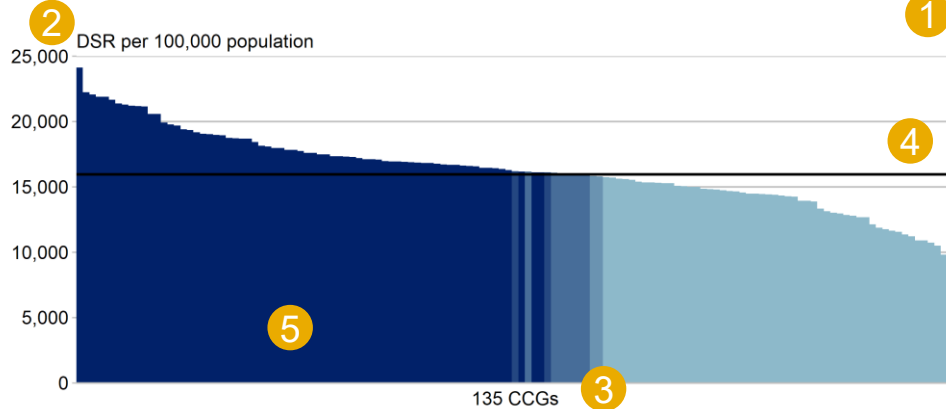
- 8 London** is presented as a separate zoomed in map for clarity.

## Chart, box plot and table

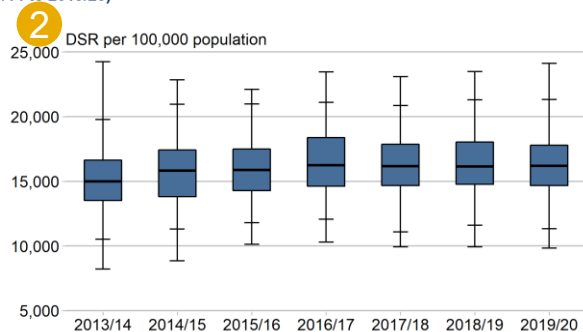
## Quick user guide

- 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.
- 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.

Column chart: Experimental statistic: Variation in rate of all vision outpatient attendances by CCG (2019/20)



Box plot time series: Experimental statistic: Variation in rate of all vision outpatient attendances by CCG (2013/14 to 2019/20)



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

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.

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 67<sup>th</sup> and 68<sup>th</sup> 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.

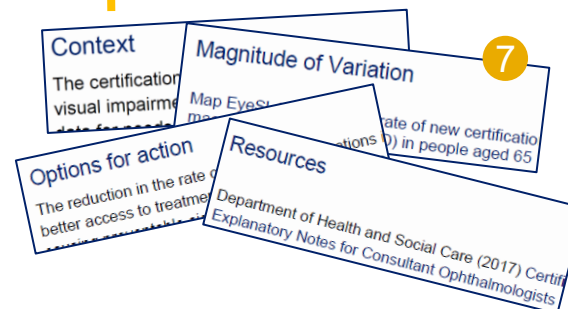
### 7 Sections in the chapter

**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

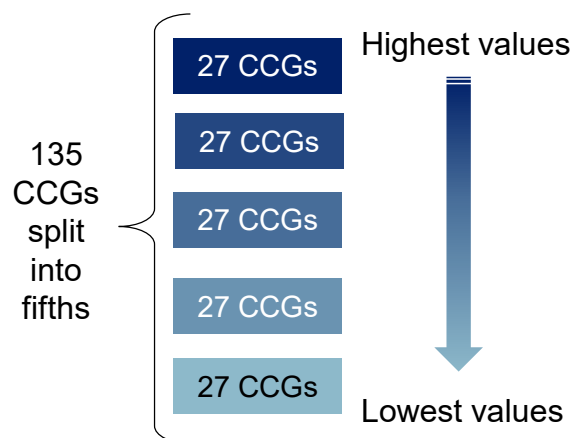
**Options for action** – suggestions for best practice

**Resources** – links to useful documents

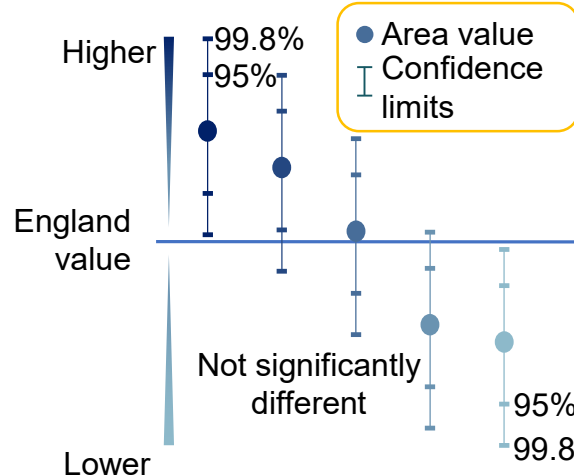


## How were the categories calculated?

## 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 99.8% and lower 95% CI, the CCG is classed as *not being significantly different* from England.

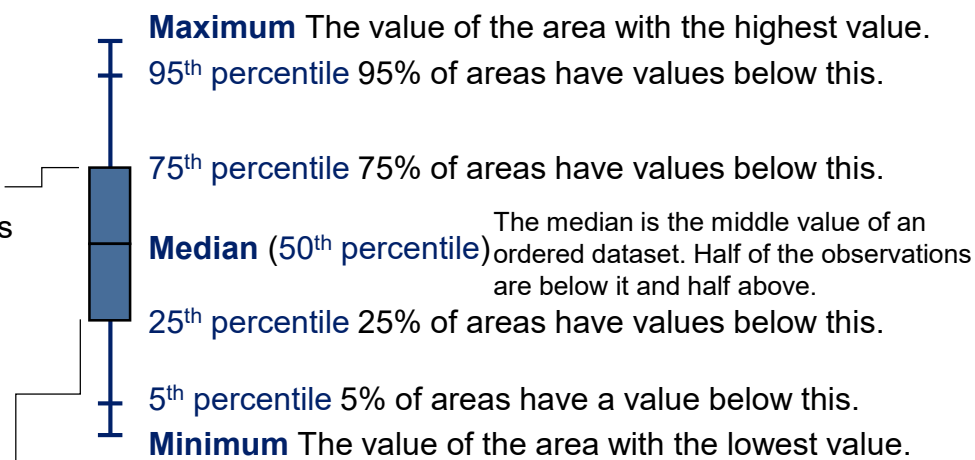
## Box &amp; whisker plot

## Whiskers

Show the extreme values in the dataset.

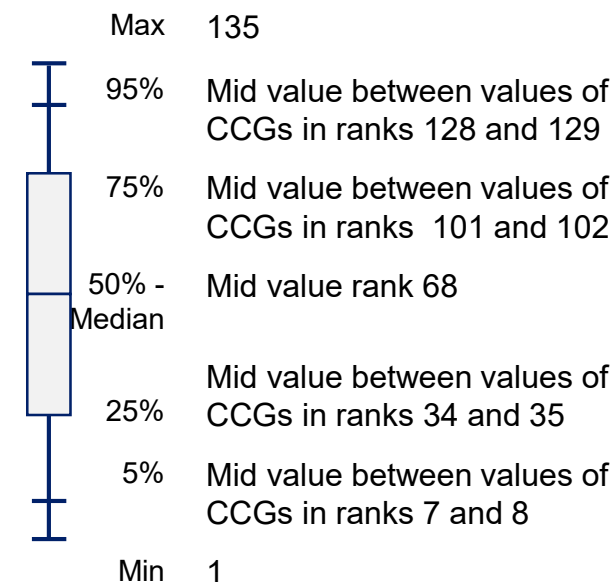
## Box

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



## Box plot percentile

## CCG rank position (135 CCGs in 2020)



# Rhegmatogenous retinal detachment surgery

## Context

The retina is the light-sensitive layer at the back of the eye. Retinal detachment refers to the separation of the retina from the surrounding tissues.<sup>1,2</sup> The process results in progressive loss of vision and can lead to permanent visual loss in the affected eye. Retinal detachment is one of the most common eye emergencies in England.

The most common type of retinal detachment is rhegmatogenous retinal detachment (RRD) associated with a tear or break in the retina.<sup>1,2</sup> The most common sub-group of RRD, are those secondary to pathological posterior vitreous detachment causing tears to form in the retina. Fluid then accumulates underneath the retina (in the subretinal space) causing retinal separation (retinal detachment).<sup>3</sup> Risk factors for this type of retinal detachment include age, myopia, eye injuries, ophthalmic operations, and familial or genetic risk factors. From the data presented in the atlas, the rate of surgery for RRD in England during the financial year beginning 2019, was 23.5 per 100,000 of the adult population affecting approximately 10,600 people a year.

The main symptoms of a retinal detachment are new or worsening floaters and sudden-onset painless and progressive visual field loss or blurred vision.<sup>2</sup> Patients presenting with one or more of these symptoms should be referred for immediate assessment by an ophthalmologist.<sup>4</sup> Prompt recognition and referral may allow early surgical repair – before the macula, the part of the retina responsible for central and colour vision, is detached – reducing the risk of permanent impairment of visual acuity,<sup>5</sup> or even preventing retinal detachment by retinopexy to any retinal tears before progression to retinal detachment has commenced. Symptomatic retinal detachment invariably results in lifelong loss of vision if left untreated.<sup>5</sup>

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<sup>1</sup> Yanoff M (editor) and Duker J (2018) *Ophthalmology* 5<sup>th</sup> ed St Louis, USA: Elsevier

<sup>2</sup> Fraser S and Steel D (2010) [Retinal detachment](#) BMJ Clin Evid. 2010;2010;0710 [Accessed 03 June 2020]

<sup>3</sup> Ang A, Poulson AV, Snead DR and others (2005) [Posterior vitreous detachment: current concepts and management](#) Compr Ophthalmol Update. 2005; 6: 167-175 [Accessed 11 May 2021]

<sup>4</sup> Kang HK and Luff AJ (2008) [Management of retinal detachment: a guide for non-ophthalmologists](#) BMJ. 2008;336(7665):1235-1240 [Accessed 03 June 2020]

<sup>5</sup> Royal College of Ophthalmologists (2010) [Ophthalmic Services Guidance: Management of acute retinal detachment](#) [Accessed 03 June 2020]

## Rhegmatogenous retinal detachment surgery during the COVID-19 pandemic

In 2020, starting from March, the number of admissions for retinal detachment repair fell when compared with previous years, showing a decrease of around 36% in April as compared to 2019. January 2021 also showed a marked decrease in admissions for retinal detachment repair. The timing for these decreases coincides with the timeline of lockdown measures imposed by the UK government in response to the coronavirus (COVID-19) pandemic.

It is very likely that these figures for reduced retinal detachment repair are not due to a fall in the prevalence of retinal detachment, but rather a fall in the number of symptomatic people seeking help from a physician. In the week following the first lockdown, primary care physicians saw a 30% drop in consultations, and would not see consultation rates recover for at least 3 months.<sup>6</sup> While retinal detachment is a serious condition requiring immediate treatment, patients who first experience symptoms such as flashes and floaters may underestimate the potential severity of these. As a result, they may Choose not to go to their GP for fear of increasing the burden on the overstretched healthcare system. They may also be worried about contracting COVID-19 in a high risk hospital environment. Additionally, as many people switched to virtual work-from-home arrangements, they could have incorrectly attributed their visual symptoms to the digital eye strain caused by increased usage of digital devices.<sup>7</sup>

As many GPs often lack the equipment, knowledge or confidence to diagnose retinal detachment, patients with flashes and floaters are often referred to optometrists for further investigation. During the COVID-19 pandemic, many optometry clinics were closed, and a large proportion of optometrists were furloughed.<sup>8</sup> As a result, many patients were unable to be seen by their usual primary care optometrist, and several optometrists expressed concerns regarding accessibility of their services and regarding referral pathways from GPs during the pandemic.<sup>8</sup>

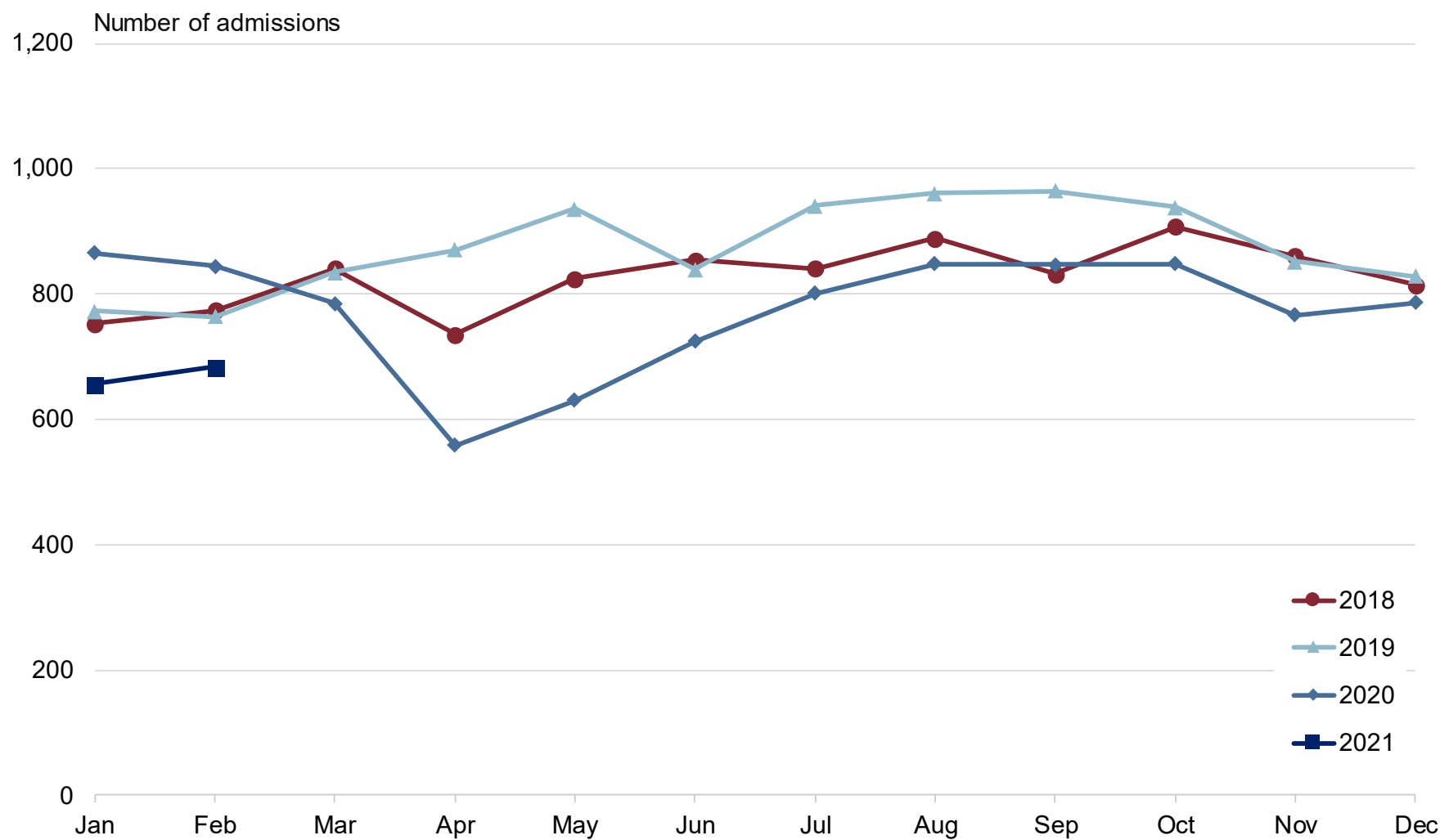
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<sup>6</sup> Watt T, Firth Z, Fisher R and others (2020) [Use of primary care during the COVID-19 pandemic](#) The Health Foundation. [Accessed 07 May 2021]

<sup>7</sup> Sheppard AL, Wolffsohn JS (2018) [Digital eye strain: prevalence, measurement and amelioration](#). BMJ Open Ophthalmol. 2018 Apr 16;3(1):e000146. [Accessed 07 Jun 2021]

<sup>8</sup> Nagra M, Allen P M, Norgett Y and others (2021). [The effect of the COVID-19 pandemic on working practices of UK primary care optometrists](#). Ophthalmic & physiological optics: the journal of the British College of Ophthalmic Opticians (Optometrists) 2021 Mar; 41(2): 378–392 [Accessed 11 May 2021]

**Figure 4.1: Provisional data: Rhegmatogenous retinal detachment surgery in people aged 18 years and over for England (January 2018 to February 2021)**



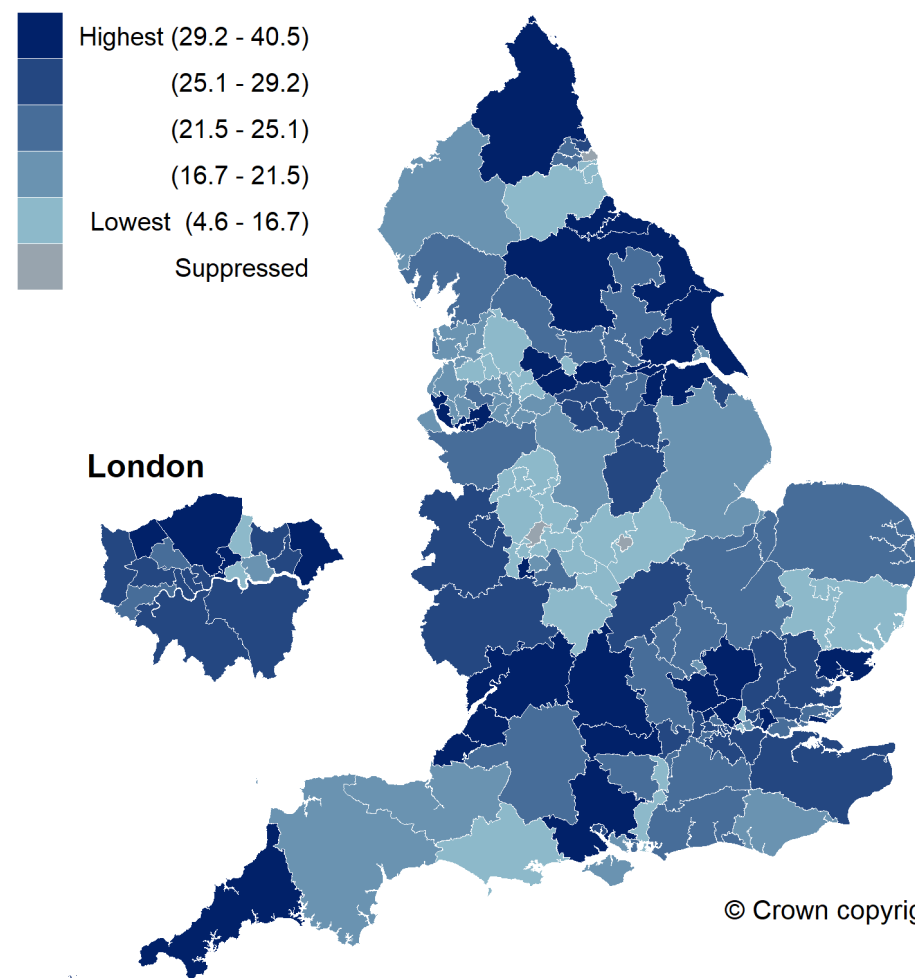


## Map 4: Variation in rate of rhegmatogenous retinal detachment surgery in people aged 18 years and over by clinical commissioning group (2019/20)

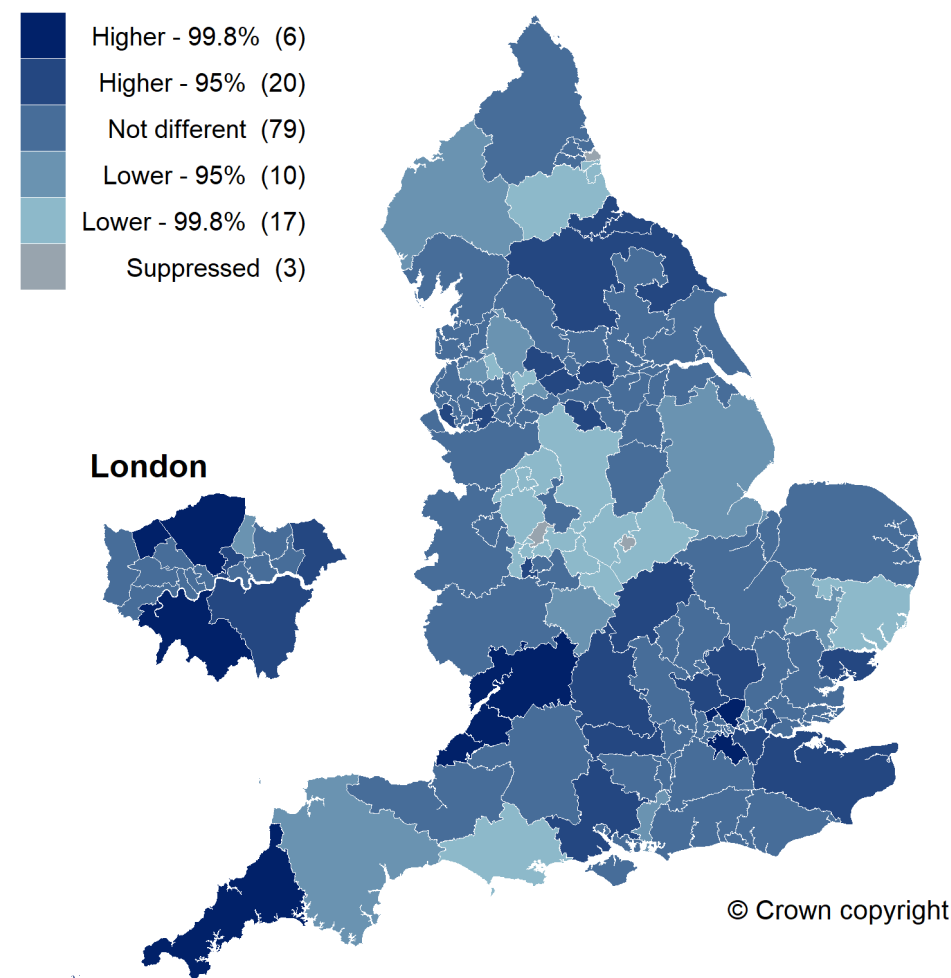
Directly standardised rate per 100,000 population

Optimum value: Requires local interpretation

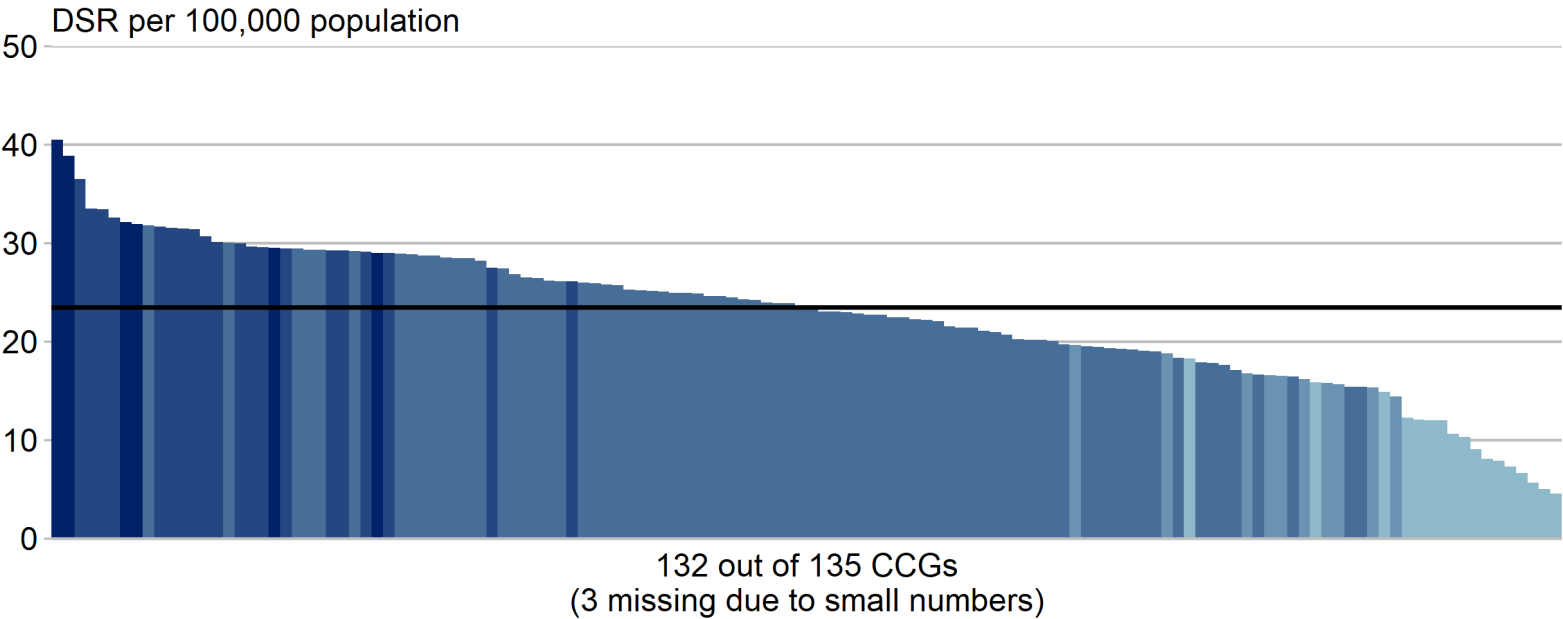
### Equal-sized quintiles of geographies



### Significance level compared with England

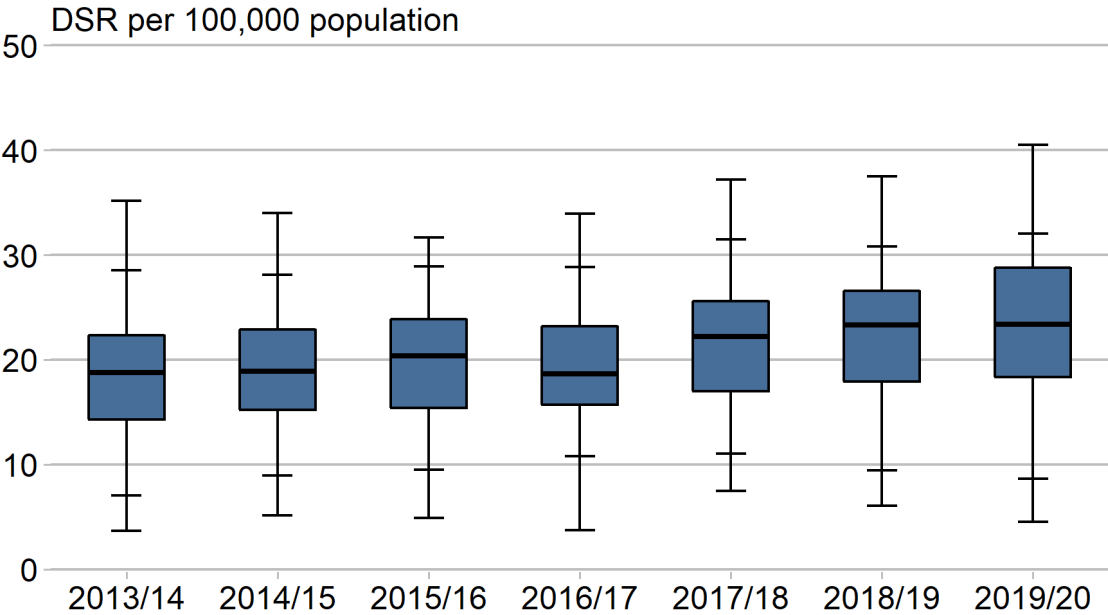


Column chart: Variation in rate of rhegmatogenous retinal detachment surgery in people aged 18 years and over by CCG (2019/20)





**Box plot time series: Variation in rate of rhegmatogenous retinal detachment surgery in people aged 18 years and over by CCG (2013/14 to 2019/20)**



Year	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	
Max-Min (Range)	31.4	28.8	26.7	30.2	29.8	31.4	36.0	No significant change
75th-25th percentile	8.1	7.7	8.5	7.5	8.6	8.6	10.4	No significant change
95th-5th percentile	21.5	19.1	19.4	18.0	20.4	21.4	23.4	No significant change
Median	18.8	18.9	20.3	18.7	22.2	23.3	23.4	INCREASING Significant

## Magnitude of Variation

### Map 4: Variation in rate of rhegmatogenous retinal detachment surgery in people aged 18 years and over by clinical commissioning group

The maps and column chart display the latest period (2019/20), during which clinical commissioning group (CCG) values ranged from 4.6 per 100,000 population to 40.5 per 100,000 population, which is a 8.9-fold difference between CCGs.

The England value for 2019/20 was 23.5 per 100,000 population.

The box plot shows the distribution of CCG values for the period 2013/14 to 2019/20.

There was no significant change in any of the three variation measures between 2013/14 and 2019/20.

The median increased significantly from 18.8 per 100,000 population in 2013/14 to 23.4 per 100,000 population in 2019/20.

Variation in recorded rates of vitreoretinal surgical activity for rhegmatogenous retinal detachment between CCGs may be due to:

#### Differences in re-operation rates and case-mix:

Depending on case-mix, some rhegmatogenous retinal detachments may require multiple procedures. Some health care providers may have a higher rate of re-operation than others reflecting those providing tertiary level surgical services for more complex cases, or differences in service effectiveness.

#### Ethnic differences between local populations:

It has been shown that White people are 3 times as likely as Asians to present with retinal detachment in the UK.<sup>9</sup>

#### Difference in gender ratios between local populations:

Males are more likely to develop traumatic rhegmatogenous retinal detachment as compared to females.<sup>9,10</sup>

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<sup>9</sup> Mowatt L, Shun-Shin G, Price N (2003) [Ethnic differences in the demand incidence of retinal detachments in two districts in the West Midlands](#) Eye 2003;17(1): 63–70 [Accessed 08 May 2021]

<sup>10</sup> Limeira-Soares PH, Lira RP, Arieta CE and others (2006) [Demand incidence of retinal detachment in Brazil](#) Eye (Lond) 2007 Mar; 21(3):348-52 [Accessed 08 May 2021]

### Differences in underlying risk factors for rhegmatogenous retinal detachment:

Differences in underlying risk factors for example posterior vitreous detachment, myopia or ocular trauma.<sup>11,12</sup>

### Data quality - accuracy and completeness of coding for diagnosis and procedures

The increase in rate of retinal detachment surgery over time may be due to:

- myopia, a predisposing factor to retinal detachment, becoming increasingly prevalent globally<sup>13</sup>
- increasing awareness of the symptoms of retinal detachment, and when to seek medical treatment
- ageing UK population<sup>14</sup>

## Options for Action

As posterior vitreous detachment accounts for the majority of acute emergency cases of rhegmatogenous retinal detachment, identifying those patients at risk at an early stage of posterior vitreous detachment is likely to be more effective in terms of prevention of retinal detachment. As such, it is recommended that a peripheral retinal examination is conducted within 6 weeks for patients with symptoms of posterior vitreous detachment, and within 2 days for patients at risk following the algorithm in Figure 4.2.

In addition, the following is recommended:

- healthcare workers are trained to identify symptoms of posterior vitreous detachment even before retinal detachment has occurred
- better information is provided by NHS111 to people experiencing posterior vitreous detachment symptoms

Patients at risk of rhegmatogenous complications include people with myopia (including those who have undergone previous refractive surgery and may no longer be refractively myopic), those who have experienced RRD or retinal tear in the fellow eye, those with family history of RRD, and those with early onset cataract or early cataract surgery below the age of 60.

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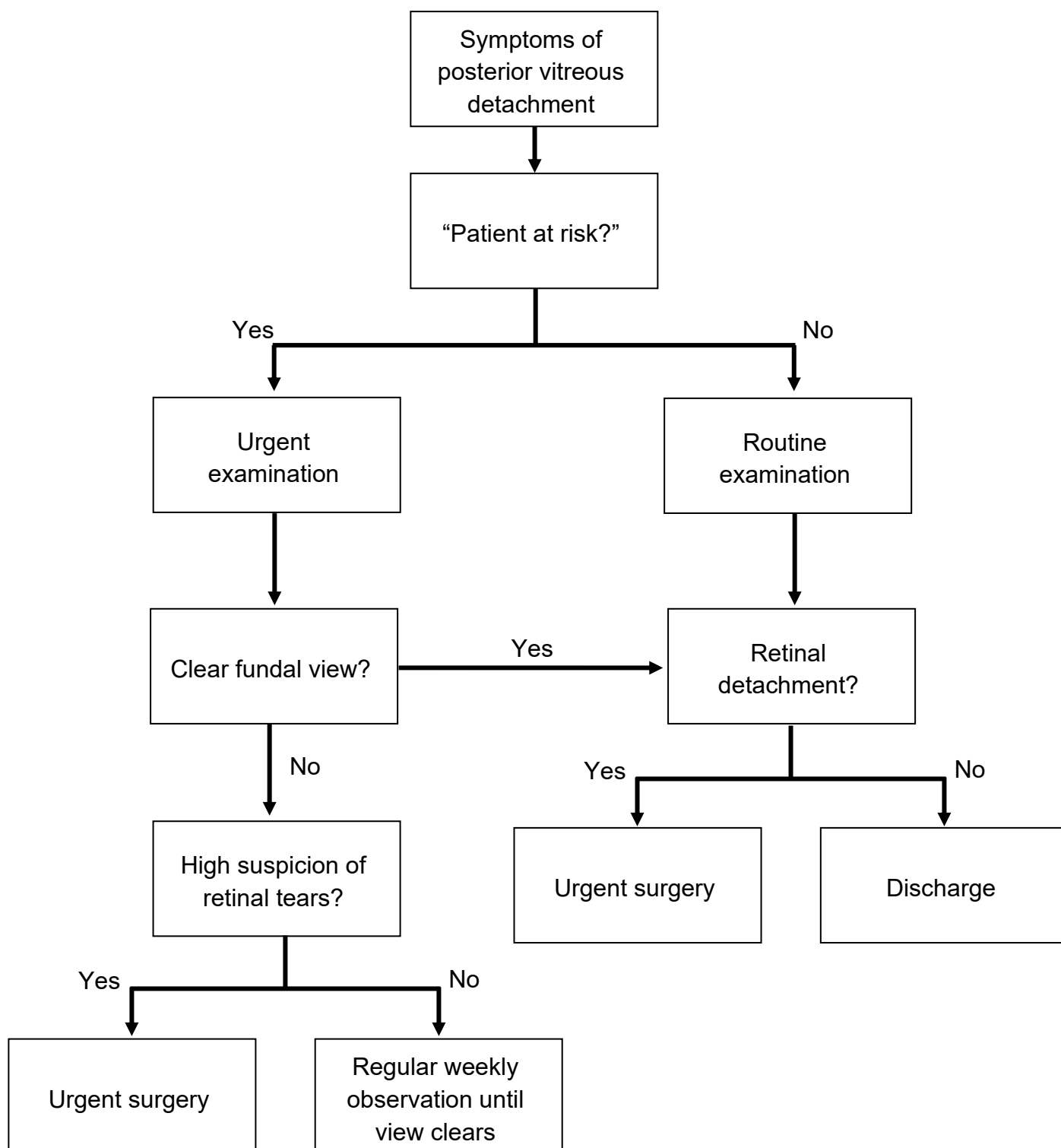
<sup>11</sup> Mitry D, Charteris DG, Fleck BW and others (2009) [The epidemiology of rhegmatogenous retinal detachment: geographical variation and clinical associations](#) British Journal of Ophthalmology, 94(6), 678–684 [Accessed 08 May 2021]

<sup>12</sup> Snead MP, Snead DR, James S and others (2008) [Clinicopathological changes at the vitreoretinal junction: posterior vitreous detachment](#) Eye, 22, 1257 – 1262 [Accessed 17 May 2021]

<sup>13</sup> Holden BA, Fricke TR, Wilson DA and others (2016) [Global Prevalence of Myopia and High Myopia and Temporal Trends from 2000 through 2050](#) Ophthalmology 2016 May;123(5):1036-42 [Accessed 10 May 2021]

<sup>14</sup> Office for National Statistics (2020) [Population estimates for the UK, England and Wales, Scotland and Northern Ireland: mid-2019](#) [Accessed 10 May 2021]

**Figure 4.2: Primary management algorithm for acute posterior vitreous detachment<sup>15</sup>**



<sup>15</sup> Diagram adapted from algorithms 1 and 2 in Ang A, Poulson AV, Snead DR and others (2005) [Posterior vitreous detachment: current concepts and management](#) Compr Ophthalmol Update. 2005; 6: 167-175 [Accessed 11 May 2021]

## Resources

Cambridge University Hospital NHS Foundation Trust [Vitreoretinal Service](#) [Accessed 17 May 2021]

Fight for Sight A-Z [Eye Conditions: Retinal detachment](#) [Accessed 03 Jun 2020]

Moorfields Eye Hospital NHS Foundation Trust [Conditions: Retinal detachment](#) [Accessed 03 Jun 2020]

National Institute for Health and Care Excellence (2019) [Clinical Knowledge Summaries: Retinal detachment](#) [Accessed 03 Jun 2020]

NHS Health A-Z: [Detached Retina \(retinal detachment\)](#) [Accessed 03 Jun 2020]

Royal College of Ophthalmologists (2010) [Ophthalmic Services Guidance: Management of acute retinal detachment](#) [Accessed 03 Jun 2020]

Royal National Institute of Blind People (RNIB) [Eye Conditions: Posterior Vitreous Detachment](#) [Accessed 11 May 2021]

Royal National Institute of Blind People (RNIB) [Eye Conditions: Retinal detachment](#) [Accessed 03 Jun 2020]

# 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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