Weekly Coronavirus Disease 2019 (COVID-19) Surveillance Report
Summary of COVID-19 surveillance systems

This report summarises the information from the surveillance systems which are used to monitor the Coronavirus Disease 2019 (COVID-19) pandemic in England. More information on the surveillance systems are available here.

The report is based on week 22 (data between 25 May and 31 May 2020) and where available daily data up to 03 June 2020. References to COVID-19 represent the disease name and SARS-CoV-2 represent the virus name.

Summary

At a national level, most COVID-19 surveillance indicators continued to decline or remained at similar levels to the previous week. Some community and syndromic indicators are now at or approaching baseline levels. We continue to see a large number of acute respiratory infection outbreaks. The majority of these are in care homes although these have declined for the past 7 weeks. There has been an increase in school outbreaks, with 15 acute respiratory infection outbreaks in schools reported in week 22. There has been an increase in primary care sentinel swab positivity in the last 2 weeks, although the numbers were low and a large proportion of these were care home cases. Deaths among COVID-19 confirmed cases continue to decline but there is still significant excess mortality observed. Activity remains highest in the North and Midlands.

Based on sero-epidemiological data from blood donors the overall adjusted seroprevalence of COVID-19 in England during weeks 18-21 is estimated at 8.5%. Prevalence varies by age group with the highest prevalence in adolescents and young adults and the lowest in those aged 60-69 years. Prevalence is 1.8% higher for males compared with females.

There have been a number of changes to social distancing measures in recent weeks: during week 20 there was some easing of restrictions on outdoor activities and encouragement for people to go back to work; during week 23 primary schools reopened for some year groups. It is too early to estimate whether the most recent changes have been associated with a change in COVID-19 activity. The school outbreaks reported in this week's report precede the primary school reopening.

As of 09:00 on 03 June 2020, a total of 1,012,510 people have been tested under Pillar 1, of which 153,376 have been confirmed positive for COVID-19 in England. There have been a total of 63,700 people who have been confirmed positive for COVID-19 in England under Pillar 2.

Figures 1 to 4 reflect cases tested under Pillar 1 (swab testing in PHE labs and NHS hospitals for those with a clinical need, and the most critical health and care workers) and Pillar 2 (mass-swab testing for critical key workers in the NHS, social care and other sectors).

Figures 5 to 10 and Tables 1 and 2 reflect cases tested under Pillar 1 only.

Overall case numbers and positivity continues to decrease in week 22. The highest number of cases continued to be seen in the older age groups, in particular in the 85+ age group. Rates and positivity of cases continue to be highest in the North of England followed by the Midlands.
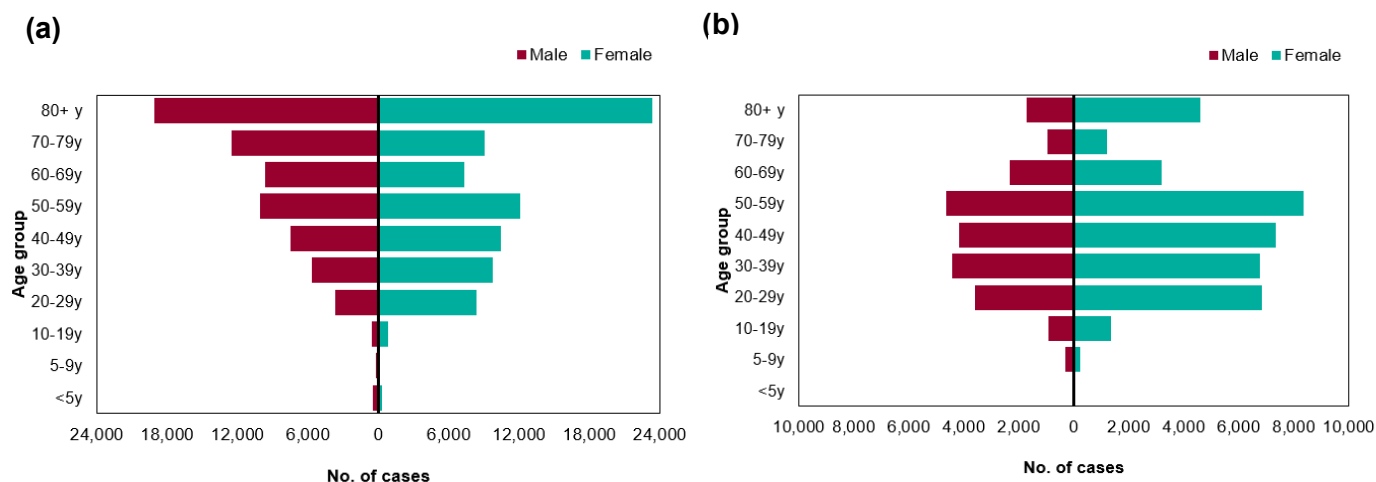
Figure 1: Laboratory confirmed COVID-19 cases tested under Pillar 1 (n=153,376) and Pillar 2 (n=63,700), based on date of sample with overall positivity (%)
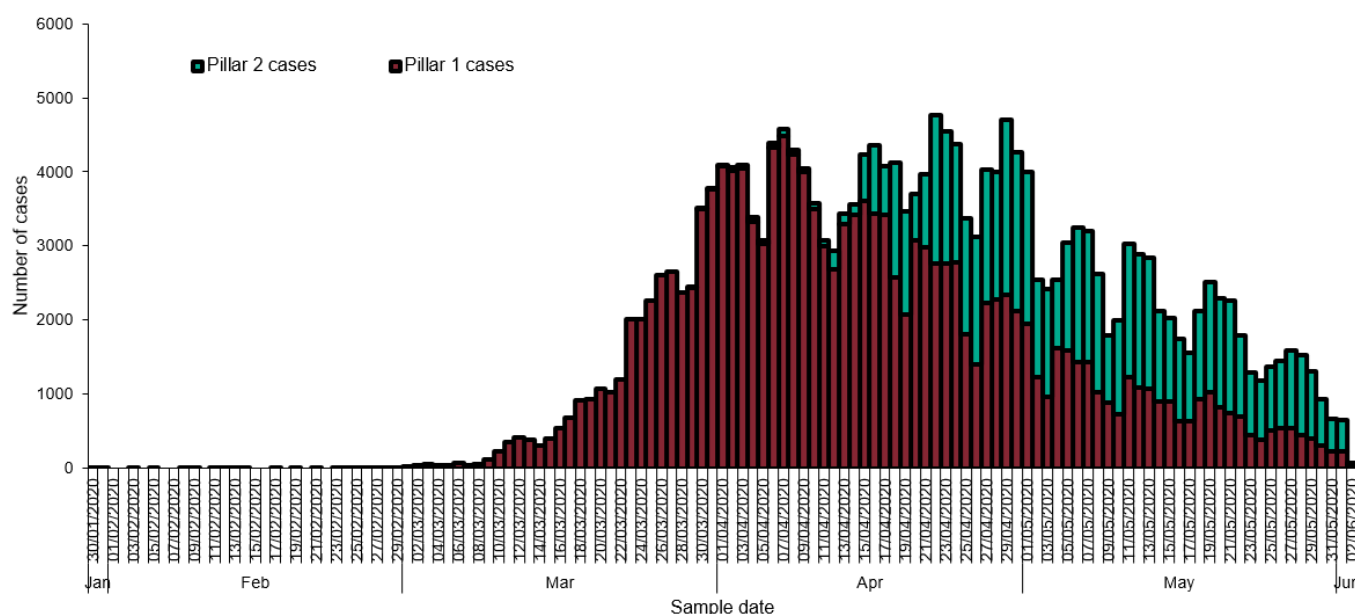

* For the most recent dates, more samples are expected therefore the decrease seen in this graph should be interpreted with caution The data are shown by the date the specimen was taken from the person being tested. This gives the most accurate analysis of this time progression, but it does mean that the latest days' figures may be incomplete.

Age and gender

Figure 2: Age/sex pyramids for laboratory confirmed COVID-19 cases tested through (a) Pillar 1 (n=151,164) and (b) Pillar 2 (n=63,027)

(a)

(b)

Figure 3: Weekly laboratory confirmed COVID-19 case rates per 100,000, tested under (a) Pillar 1 and (b) Pillar 2, by gender
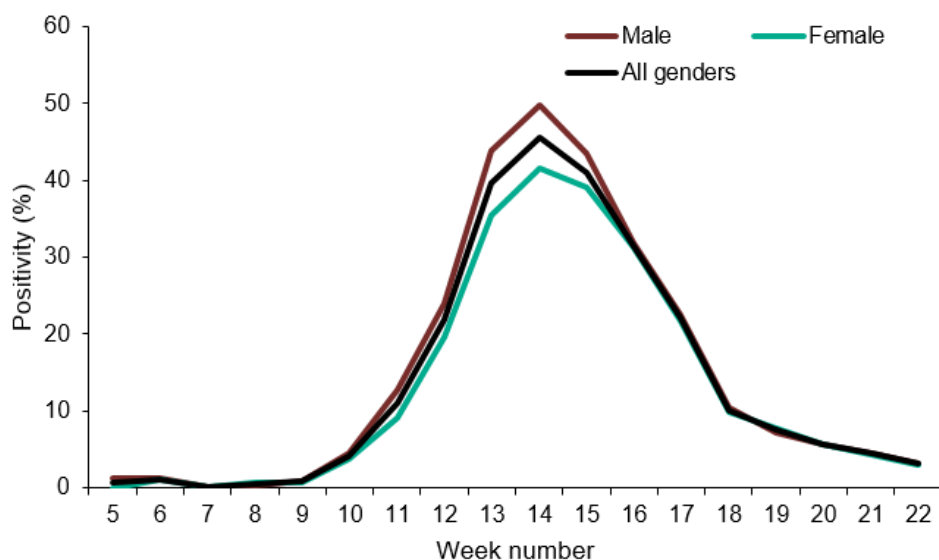
(a)

(b)
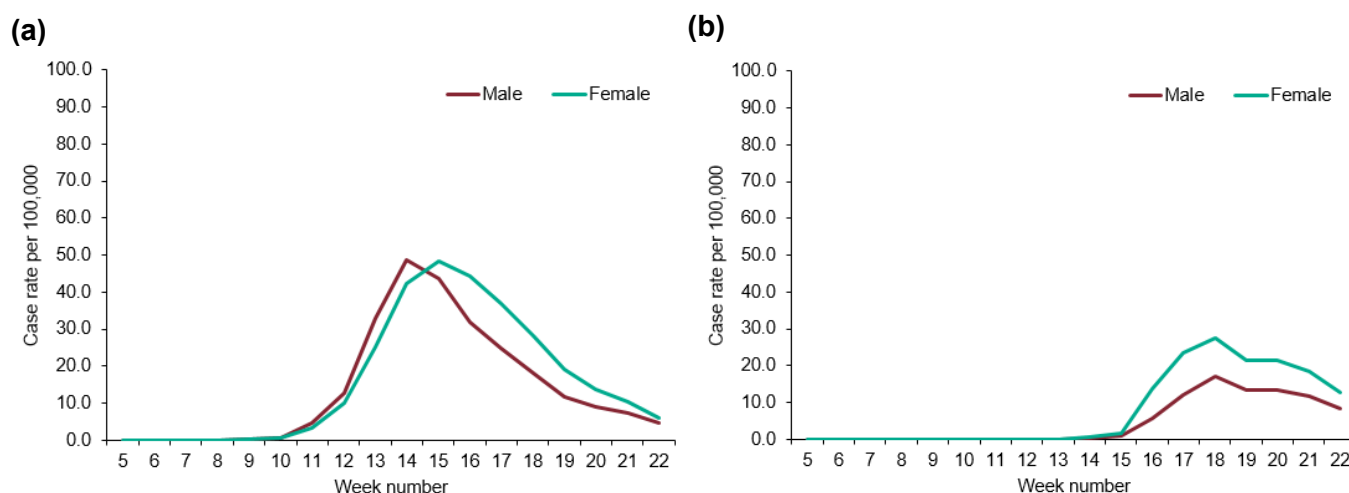
Figure 4: Weekly laboratory confirmed COVID-19 case rates per 100,000, tested under (a) Pillar 1 and (b) Pillar 2 , by age group
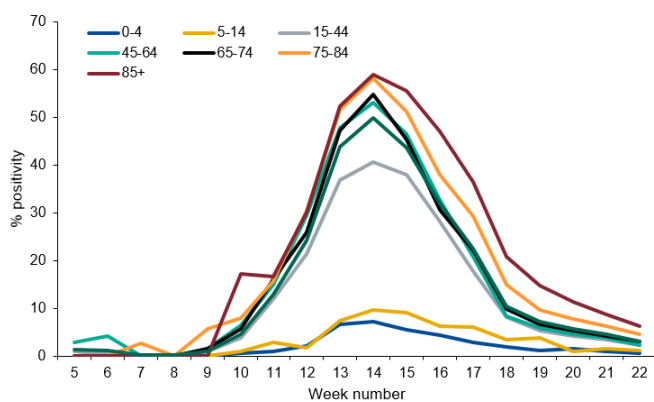
(a)

(b)

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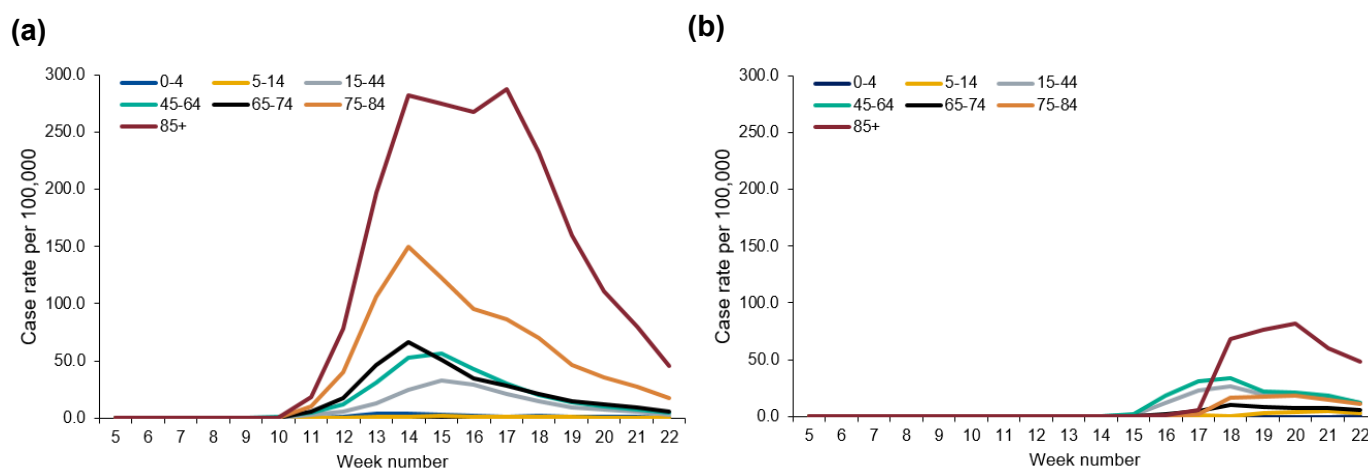
Figure 5: Weekly positivity (%) of laboratory confirmed COVID-19 cases tested under Pillar 1, (a) overall and by gender and (b) by gender and age group (SGSS and Respiratory DataMart)
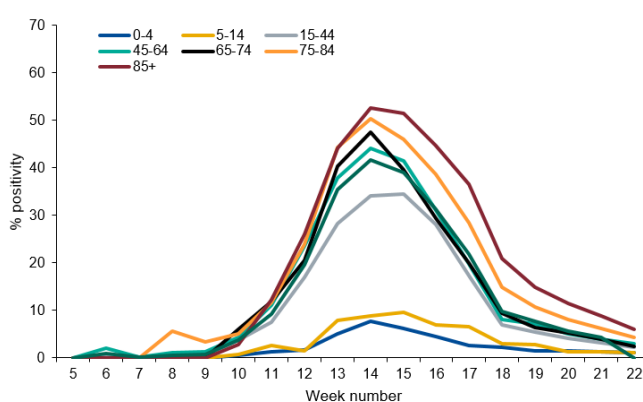
**(a) Overall positivity % and by gender**

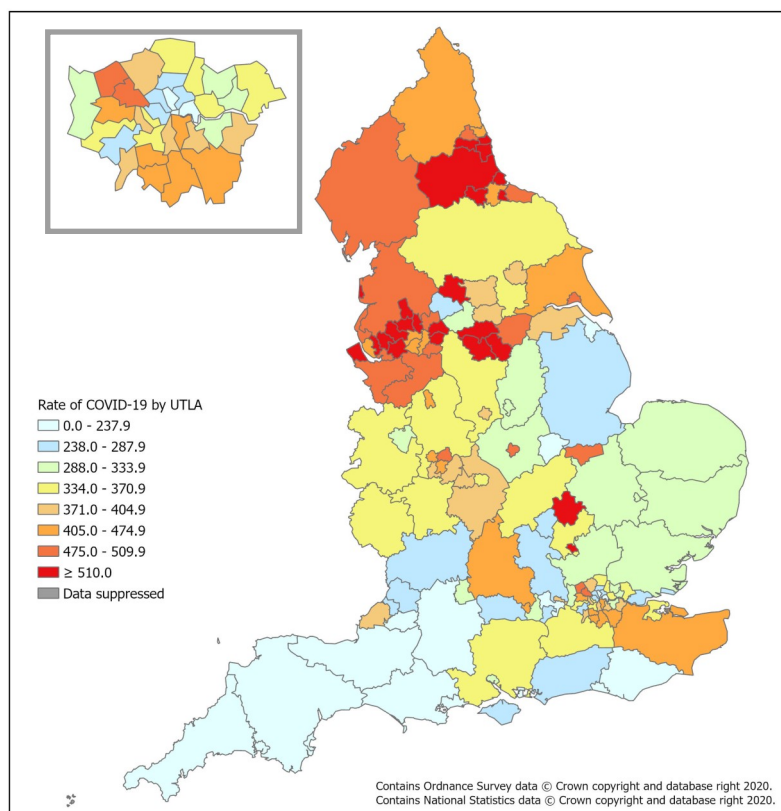

(a) Male

(b) Female

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PHE Centres and upper-tier local authority (UTLA)

Table 1: Cumulative number of cases under Pillar 1 (n=147,038) and Pillar 2 (n=62,530) and total number of people tested under Pillar 1 (n=927,064) by PHE Centres
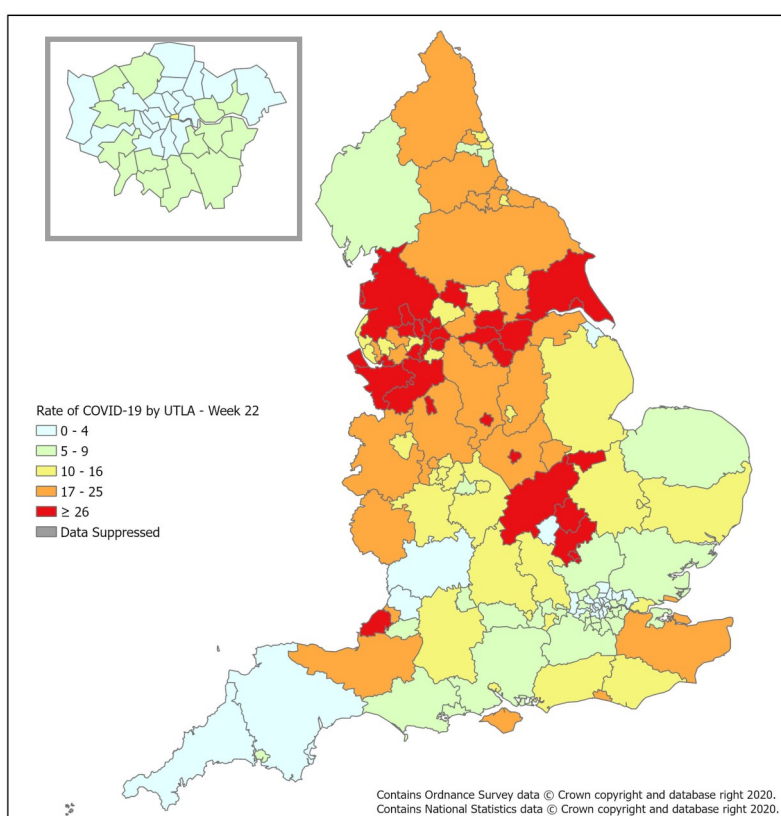
PHE Centres	Pillar 1 cases	Pillar 2 cases	Total number of people tested (under Pillar 1 only)
North East	10,294	3,872	54,743
North West	25,891	11,430	129,118
Yorkshire & Humber	14,433	9,106	98,192
West Midlands	16,296	6,506	100,073
East Midlands	9,266	6,886	64,662
East of England	14,819	6,705	102,722
London	27,042	5,159	139,680
South East	21,253	8,665	144,220
South West	7,744	4,201	93,654

Figure 6: Weekly laboratory confirmed COVID-19 case rates per 100,000 tested under Pillar 1, by PHE Centres and sample date week
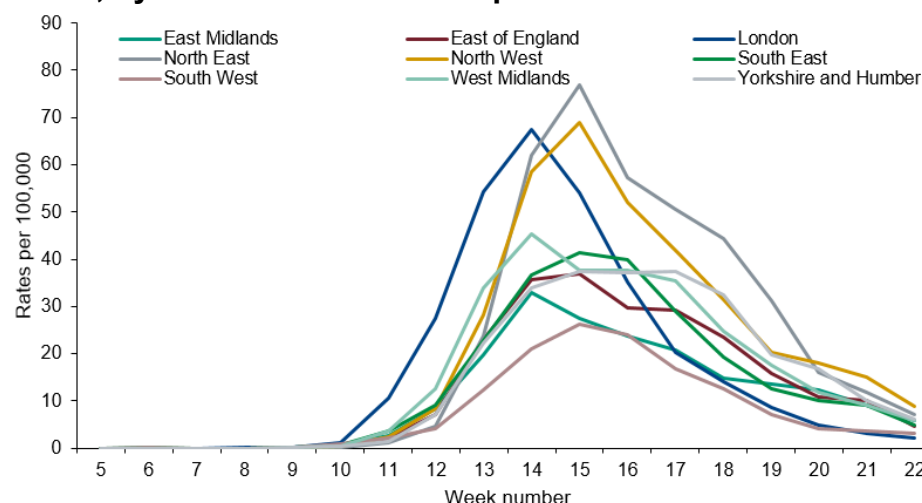
Figure 7: Weekly positivity of laboratory confirmed COVID-19 cases tested under Pillar 1 (%) by PHE Centres and sample date week, (SGSS and Respiratory DataMart)

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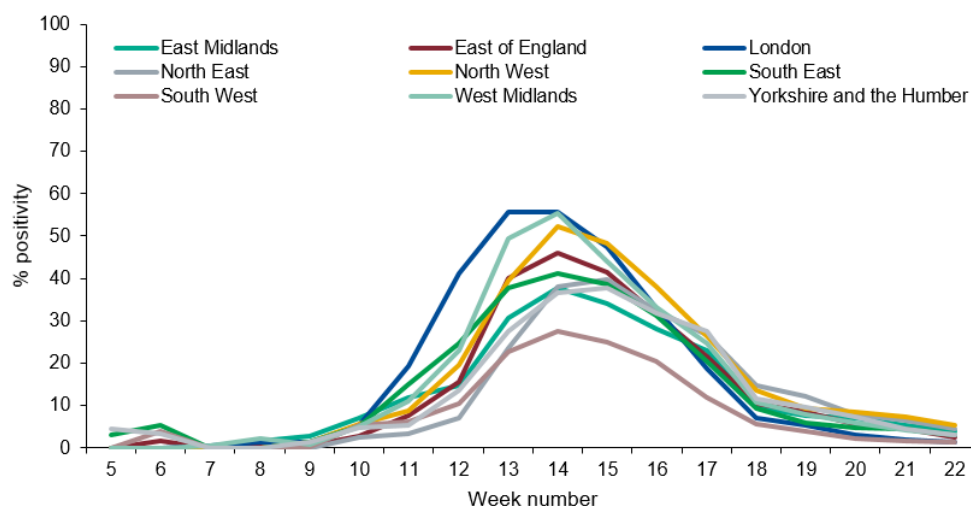
Figure 8: Cumulative rate of COVID-19 cases per 100,000 tested under Pillar 1 and 2, by upper-tier local authority, England (box shows enlarged maps of London area)

Rate of COVID-19 by UTLA
- 0.0 - 237.9
- 238.0 - 287.9
- 288.0 - 333.9
- 334.0 - 370.9
- 371.0 - 404.9
- 405.0 - 474.9
- 475.0 - 509.9
- ≥ 510.0
- Data suppressed

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Figure 9: Weekly rate of COVID-19 cases per 100,000 tested under Pillar 1 and 2, by upper-tier local authority, England (box shows enlarged maps of London area)

Rate of COVID-19 by UTLA - Week 22
- 0 - 4
- 5 - 9
- 10 - 16
- 17 - 25
- ≥ 26
- Data Suppressed

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Ethnicity

Figure 10: Ethnic group of cumulative laboratory confirmed COVID-19 cases tested under Pillar 1 (n=140,203)
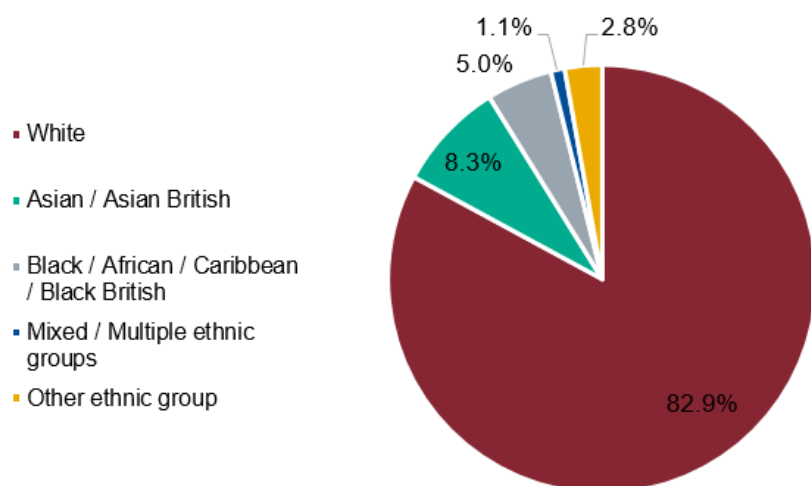
Table 2: Number of cases tested under Pillar 1 and percentage (%) by ethnic group and week

Ethnic group	Week - number (%)			
	19	20	21	22
White	6,359 (87.6%)	4,833 (89.0%)	3,776 (88.6%)	2,204 (87.2%)
Asian / Asian British	221 (3.0%)	150 (2.8%)	98 (2.3%)	63 (2.5%)
Black / African / Caribbean / Black British	475 (6.5%)	307 (5.7%)	242 (5.7%)	188 (7.4%)
Mixed / Multiple ethnic groups	58 (0.8%)	45 (0.8%)	46 (1.1%)	26 (1.0%)
Other ethnic group	146 (2.0%)	94 (1.7%)	101 (2.4%)	47 (1.9%)

This section summarises the monitoring of acute respiratory outbreaks and internet based surveillance systems for COVID-19.

Acute respiratory outbreaks, England

Information on acute respiratory outbreaks is collected by PHE's Health Protection Teams (HPTs).
An outbreak is defined as two or more people experiencing a similar illness, which appears to be linked to a particular setting.

151 new acute respiratory outbreaks have been reported in week 22 (Figure 11):

- 111 outbreaks were from care homes where 62 tested positive for SARS-CoV-2
- 8 outbreaks were from hospitals where 6 tested positive for SARS-CoV-2
- 15 outbreaks were from schools where 9 tested positive for SARS-CoV-2
- 2 outbreak were from prisons where one tested positive for SARS-CoV-2
- 15 outbreaks were from the Other Settings category where 10 tested positive for SARS-CoV-2

Figure 11: Number of acute respiratory outbreaks by institution, England
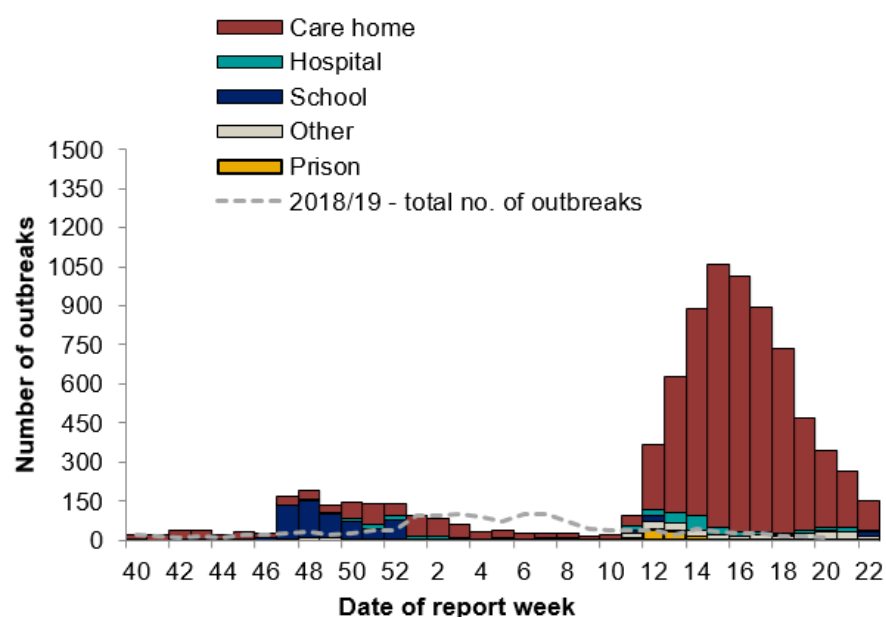
NHS 111

The NHS 111 service monitors daily trends in phone calls made to the service in England, to capture trends in infectious diseases such as influenza and norovirus.

Up to 31 May 2020, the daily percentage of NHS 111 'potential COVID-19-like calls (as a percentage of total NHS 111 calls) and the daily number of NHS 111 'potential COVID-19' completed online assessments decreased (Figure 12).

Please note that all NHS 111 'potential COVID-19' indicators may not include all NHS 111 integrated urgent care service calls and therefore should be used to monitor trends rather than numbers. All NHS 111 indicator trends should be interpreted with caution due to current national advice and guidance regarding access to health care services during the COVID-19 pandemic.

Further information about these caveats is available from the PHE Remote Health Advice Syndromic Surveillance bulletin.

Figure 12 (a-b): NHS 111 telephony and online potential COVID-19 indicators, England

(a) Daily 'potential COVID-19' calls received through the NHS 111 telephony service as a percentage of total calls (and moving 7-day average), England
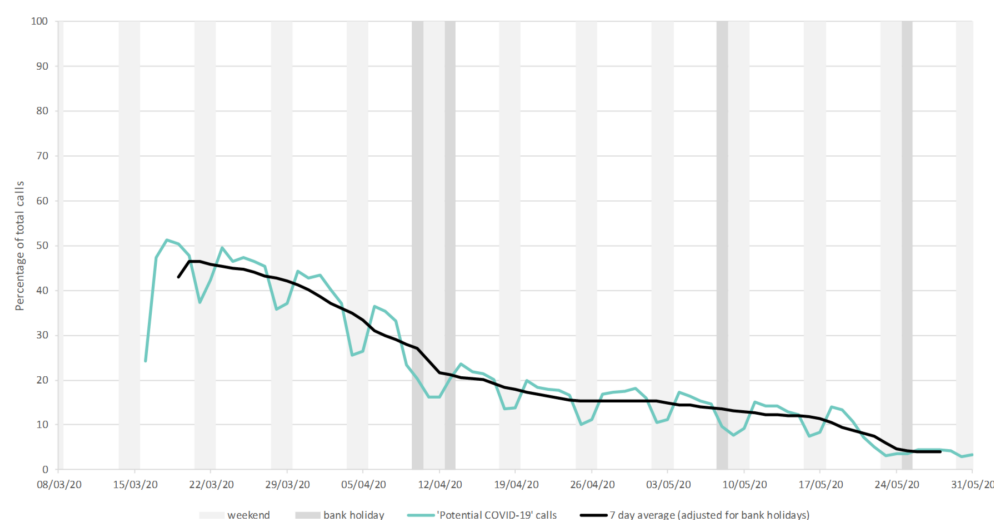
(b) Daily 'potential COVID-19' NHS 111 online assessments as the number of completed online assessments (and 7-day moving average), England
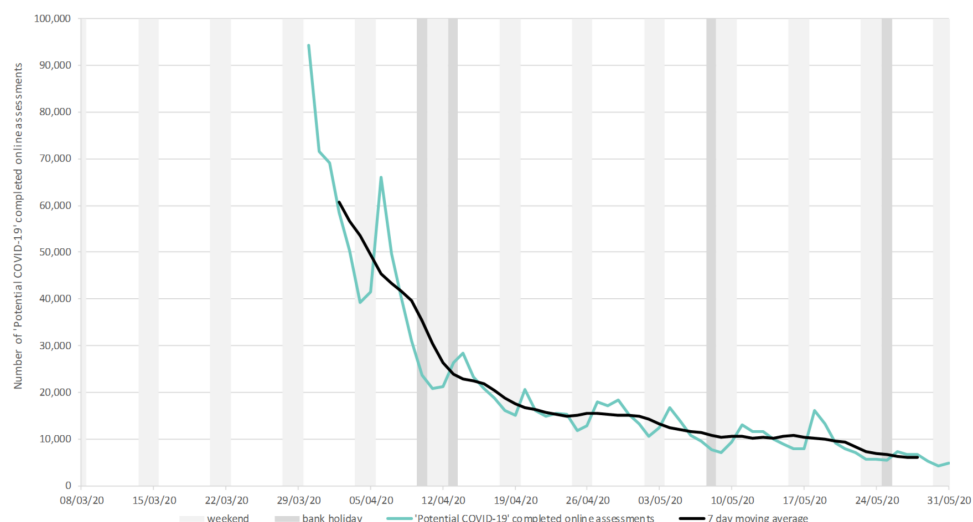
Internet based surveillance

PHE's internet based surveillance systems aim to monitor the volume of people searching for typical symptoms of COVID-19 on the internet as well as tracking self-reported respiratory symptoms and health seeking behaviour patterns related to COVID-19.

Google search queries

This is a web-based syndromic surveillance system which uses daily search query frequency statistics obtained from the Google Health Trends API.[1] This model focuses on search queries about COVID-19 symptoms as well as generic queries about "coronavirus" (e.g. "covid-19"). The search query frequency time series has been weighted based on symptom frequency as reported in other data sources. Frequency of searches for symptoms is compared with a baseline calculated from historical daily data.

The overall and media-debiasing weighted scores continued to remain stable throughout week 22 (Figure 13).

[1] For more information about this model, please see https://arxiv.org/abs/2003.08086

Figure 13: Normalised Google search score for COVID-19 symptoms, with weighted score for media-debiasing and historical trend, England
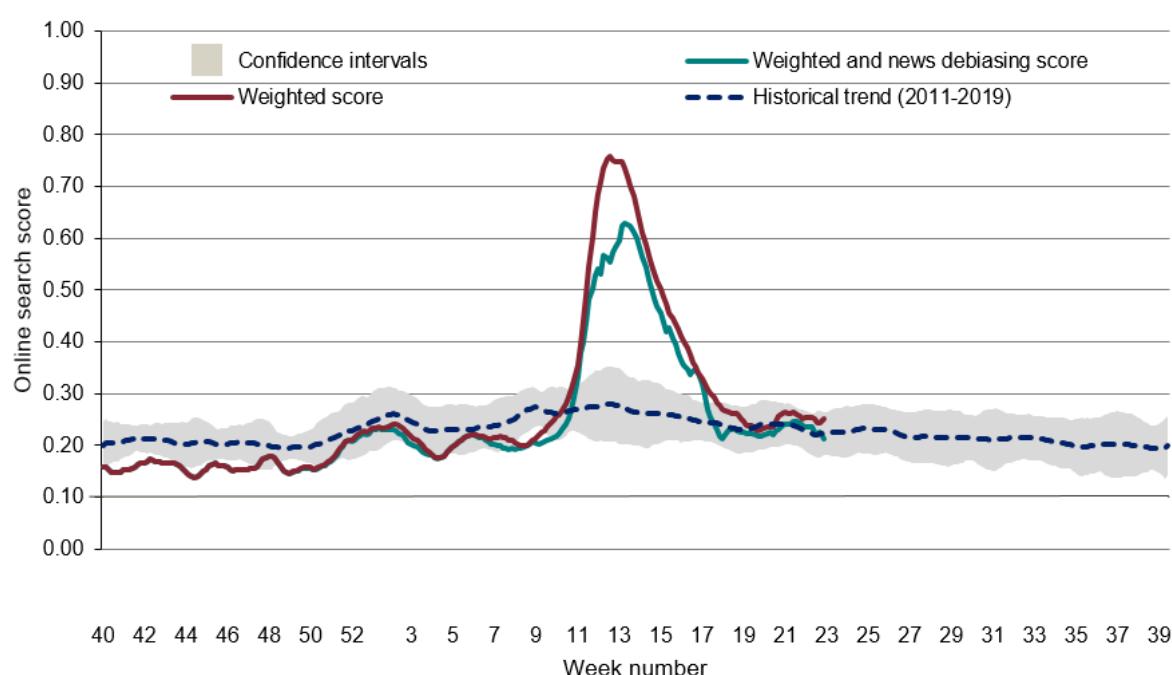
**Internet based surveillance**

FluSurvey

An internet based surveillance system has been developed based on FluSurvey. FluSurvey is a web tool survey designed to monitor trends of influenza like illness (ILI) in the community using self-reported respiratory symptoms from registered participants. The platform has been adapted to capture respiratory symptoms, exposure risk and healthcare seeking behaviours among registered participants to contribute to national surveillance of COVID-19 activity.

A total of 4,059 participants completed the weekly COVID-19 surveillance survey in week 22, of which 116 (2.9%) reported fever or cough, a slight decrease from 4.0% reported in week 21. The most commonly reported method of access to healthcare services was through telephone services (Figure 14), which is in line with current government recommendations.

Figure 14: Rate of contact with different healthcare services among FluSurvey participants reporting fever or cough symptoms, week 09 to 22, England
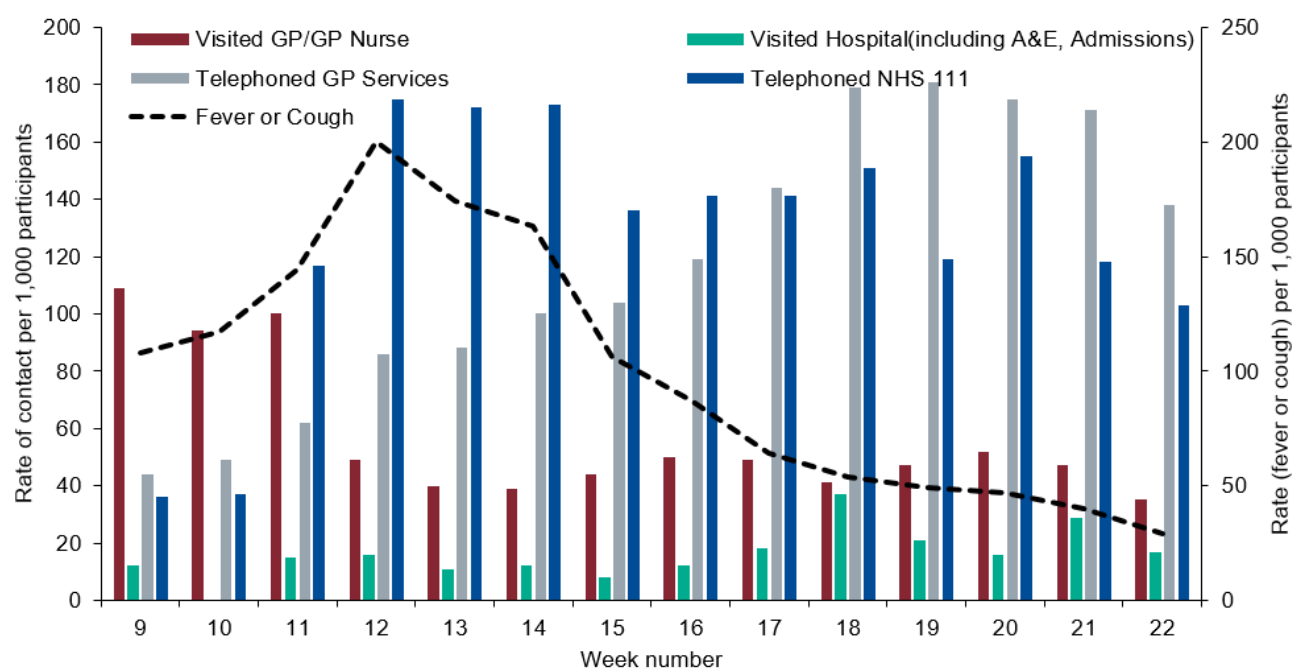
GP In Hours (GPIH) and GP Out of Hours (GPOOH), Syndromic surveillance

The GP In Hours (GPIH) syndromic surveillance system monitors the number of GP visits during regular hours of known clinical indicators. The GP Out of Hours (GPOOH) syndromic surveillance system monitors the numbers of daily unscheduled visits and calls to GPs during evenings, overnight, on weekends and on public holidays. Both systems cover around 55% of England's population.

Up to 31 May 2020, GPIH consultations for potential COVID-19-like and ILI consultations decreased further (Figure 15). Through GPOOH consultations (up to 31 May 2020), the daily percentage (as a percentage of total contacts with a Read code) for ILI contacts remained stable, while difficulty breathing/wheeze/asthma contacts decreased (Figure 16).

Please note GP data should be interpreted with caution due to changes in advice regarding accessing GP surgeries due to COVID-19. Influenza-like-illness (ILI) rates are now approaching baseline levels after a recent change in the use of a new COVID-19 Care Pathway template which had affected recording of influenza-like illness from mid-April (Figure 12(a)). Further information about these caveats is available from the PHE GP In Hours Syndromic Surveillance bulletin.

Figure 15 (a-b): GPIH clinical indicators, England

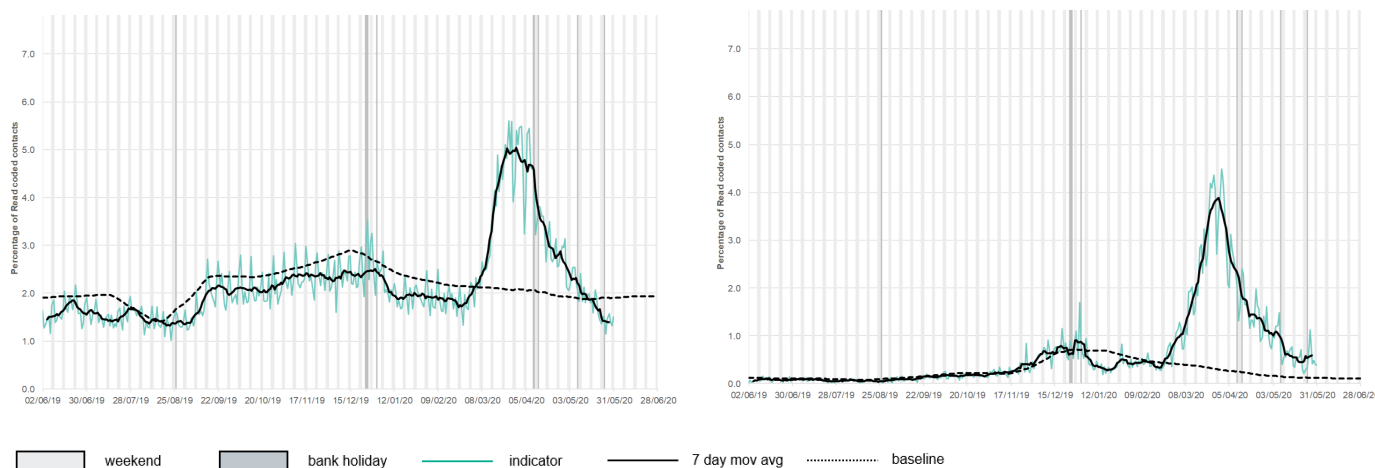(a) potential COVID-19 GP consultations, daily incidence rates per 100,000 population, all ages

(b) Influenza-like illness consultations, daily incidence rates per 100,000 population, all ages
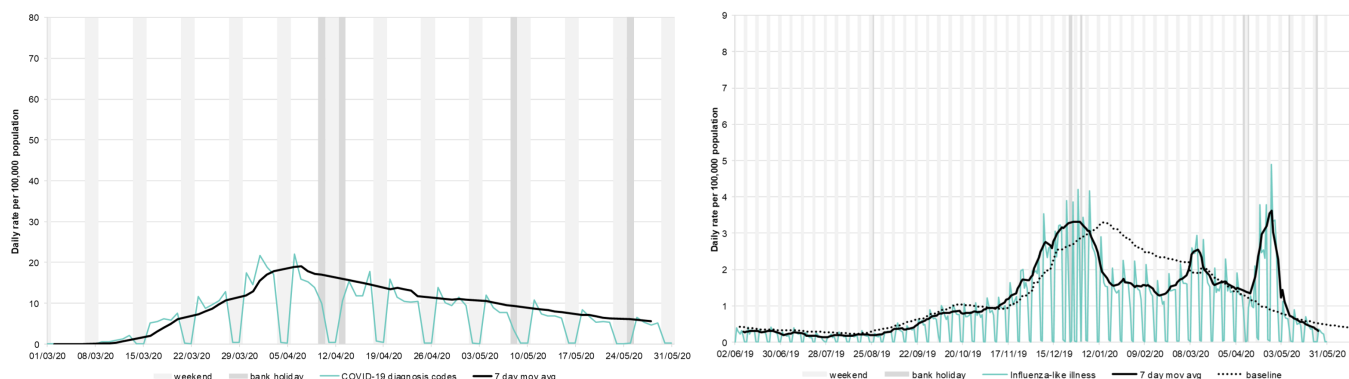
Figure 16 (a-b) : GPOOH contacts indicators, England

(a) Difficulty breathing/wheeze/asthma, daily contacts (%), all ages

(b) Influenza-like illness, daily contacts (%), all ages

RCGP Swabbing Scheme

This is an extended primary care surveillance system through the RCGP sentinel integrated clinical and virological scheme. The extension of the scheme was initiated on 24 February 2020. A sample of patients presenting to around 200 GP practices with Influenza-like Illness (ILI) and Lower Respiratory Tract Infections (LRTI) (not suspected for COVID-19) will be tested. This enables the week on week monitoring of test "positivity rate" to observe the trend in the proportion of people with confirmed COVID-19.

Up to 03 June 2020, a total of 4,315 patients have been tested of which 585 have tested positive for SARS-CoV-2 through this scheme. The overall positivity decreased at 6.2% (4/65) in week 22 compared to 8.4% (14/166) in the previous week (Figure 17). Six out of 14 patients in week 21were residents from one care homes and 3 out 4 patients were residents from three difference care homes. Consultations for ILI and LRTI have continued to decrease (Figure 17). The highest positivity by PHE region was noted in the North region (Figure 18). The highest positivity by age group was observed in the 45-64 year olds and by gender in females (Figure 19).

Figure 17: Overall weekly positivity (%), ILI and LRTI consultations rates (per 100,000), RCGP, England
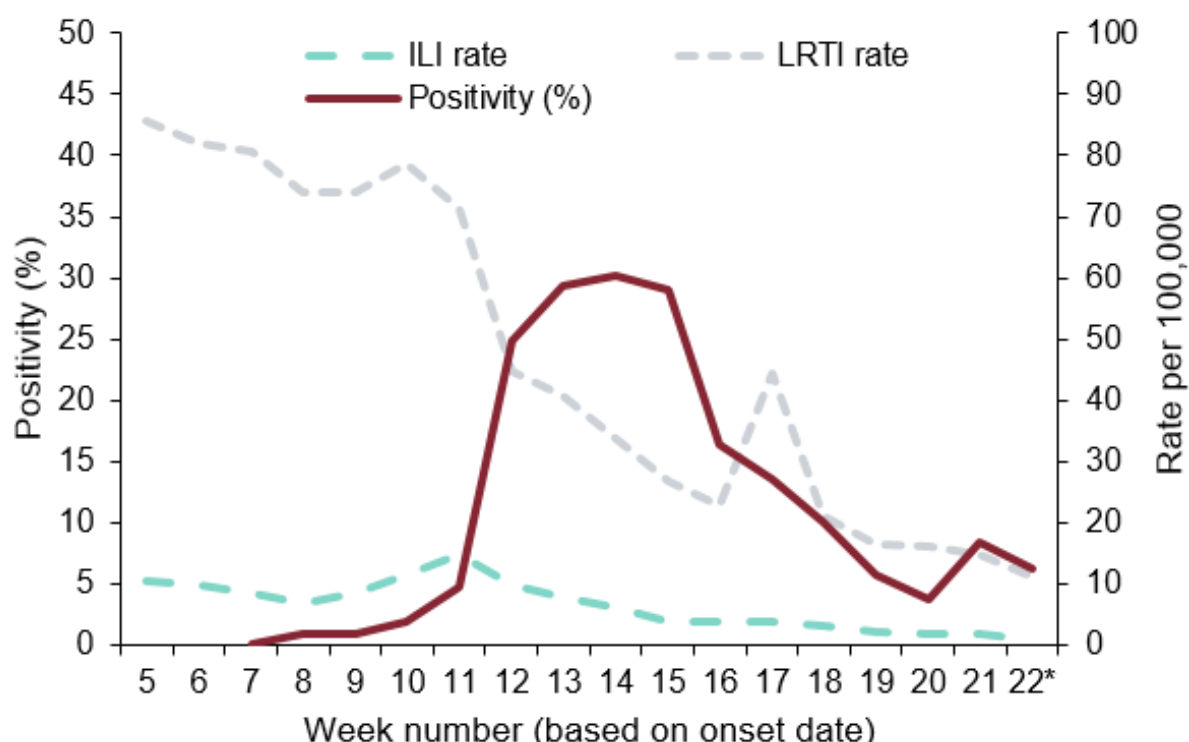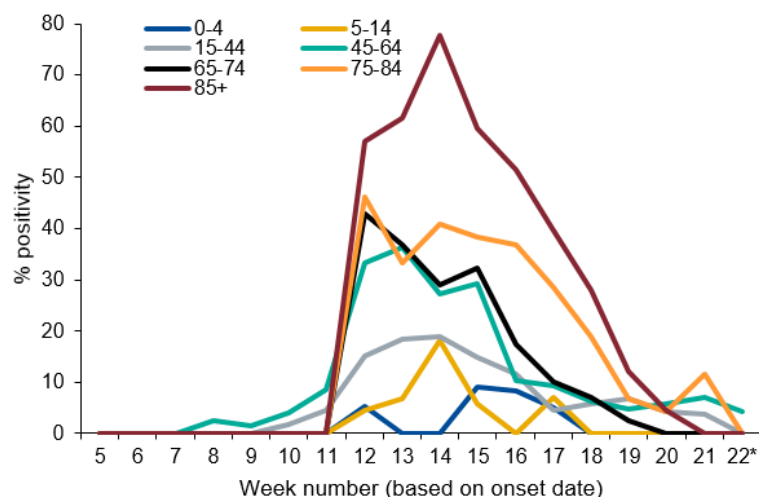

*For the most recent week, more samples are expected to be tested therefore the graph in Figures 17-19 should be interpreted with caution

*Positivity (%) is not calculated when the total number tested is less than 10

RCGP Swabbing Scheme

Figure 18: Overall positivity (%) (weekly) by PHE Region, England (RCGP)
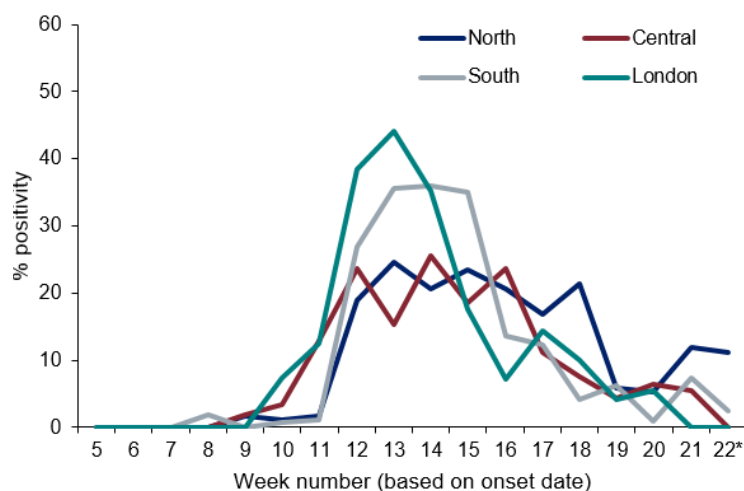
Figure 19: Positivity (%) (weekly) by (a) age group and (b) gender, England (RCGP)

(a)

(b)

*For the most recent week, more samples are expected to be tested therefore the graph in Figures 17-19 should be interpreted with caution

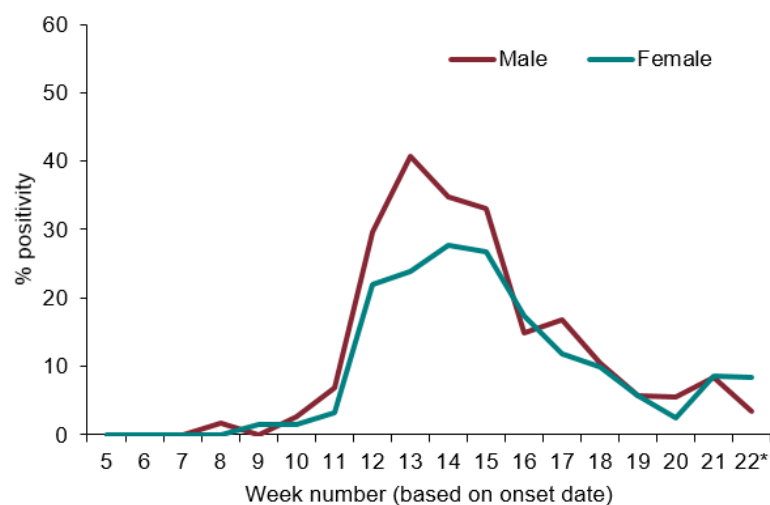*Positivity (%) is not calculated when the total number tested is less than 10

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Emergency Department attendances, Syndromic surveillance

The Emergency Department Syndromic Surveillance System (EDSSS) monitors the daily visits in a network of emergency departments across England.

Up to 31 May 2020, the daily number of ED attendances for all ages as reported by 77 EDs in England during week 22, for COVID-19-like attendances decreased (Figure 20).

Please note: the COVID-19-like ED indicator is an underestimation of number of COVID-19 attendances as it only includes attendances with a COVID-19-like diagnosis as their primary diagnosis. The EDSSS COVID-19-like indicator should therefore be used to monitor trends in ED attendances and not to estimate actual numbers of COVID-19 ED attendances. Further information about these caveats is available from the PHE Emergency Department Syndromic Surveillance bulletin.

**Figure 20: COVID-19-like, daily ED attendances, all ages, England**
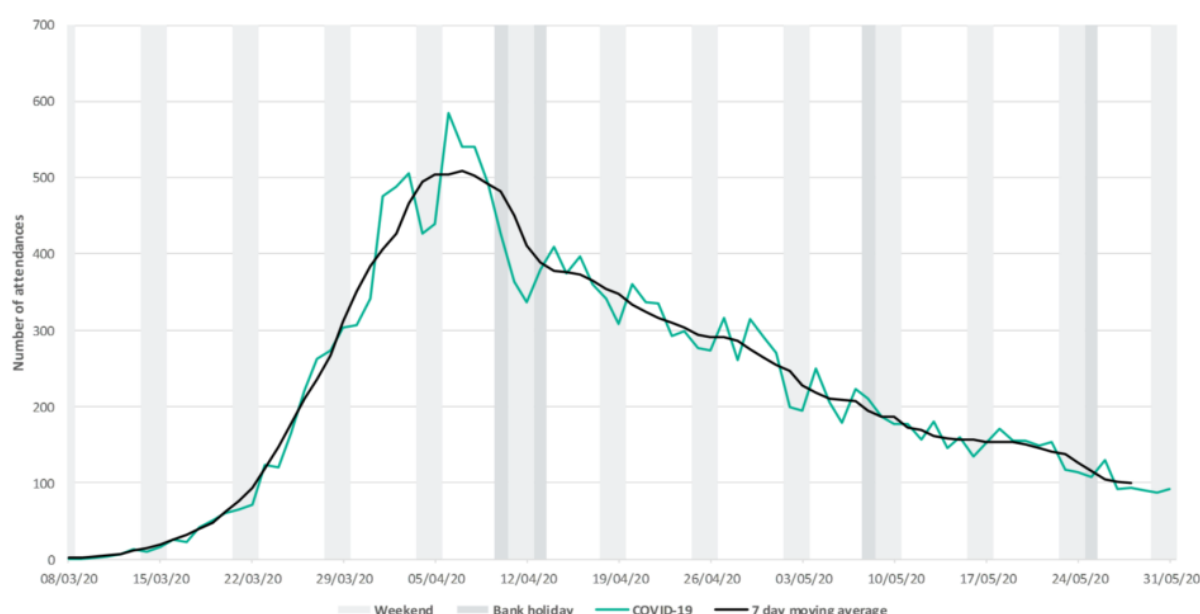
COVID-19 Hospitalisation in England Surveillance System (CHESS)

The CHESS surveillance system monitors daily new acute respiratory infections (ARI) and new laboratory confirmed COVID-19 admissions to hospital including critical care (ICU/HDU). Trends in hospital and critical care admission rates need to be interpreted in the context of testing recommendations.

A total of 134 NHS Trusts are now participating, although the number of Trusts reporting varies by day. The daily rate of new admissions of COVID-19 cases is based on the trust catchment population of those NHS Trusts who made a new return each day. This may differ from other published figures such as the total number of people currently in hospital with COVID-19.

Up to 03 June 2020, the daily admission rates for both hospitalisations and ICU/HDU COVID-19 admissions remained stable. The hospitalisation rate was at 0.84 per 100,000 (03 June 2020) compared to 0.84 per 100,000 for the same day (27 May 2020) in the previous week. The ICU/HDU rate was at 0.08 per 100,000 (03 June 2020) compared to the same rate for the same day (27 May 2020) in the previous week (Figure 21). By NHS regions, the highest hospitalisation and ICU/HDU rate was observed in the North West (Figure 22).

Figure 21: Overall daily hospital and ICU/HDU admission rates per 100,000 of new COVID-19 positive cases reported through CHESS, England
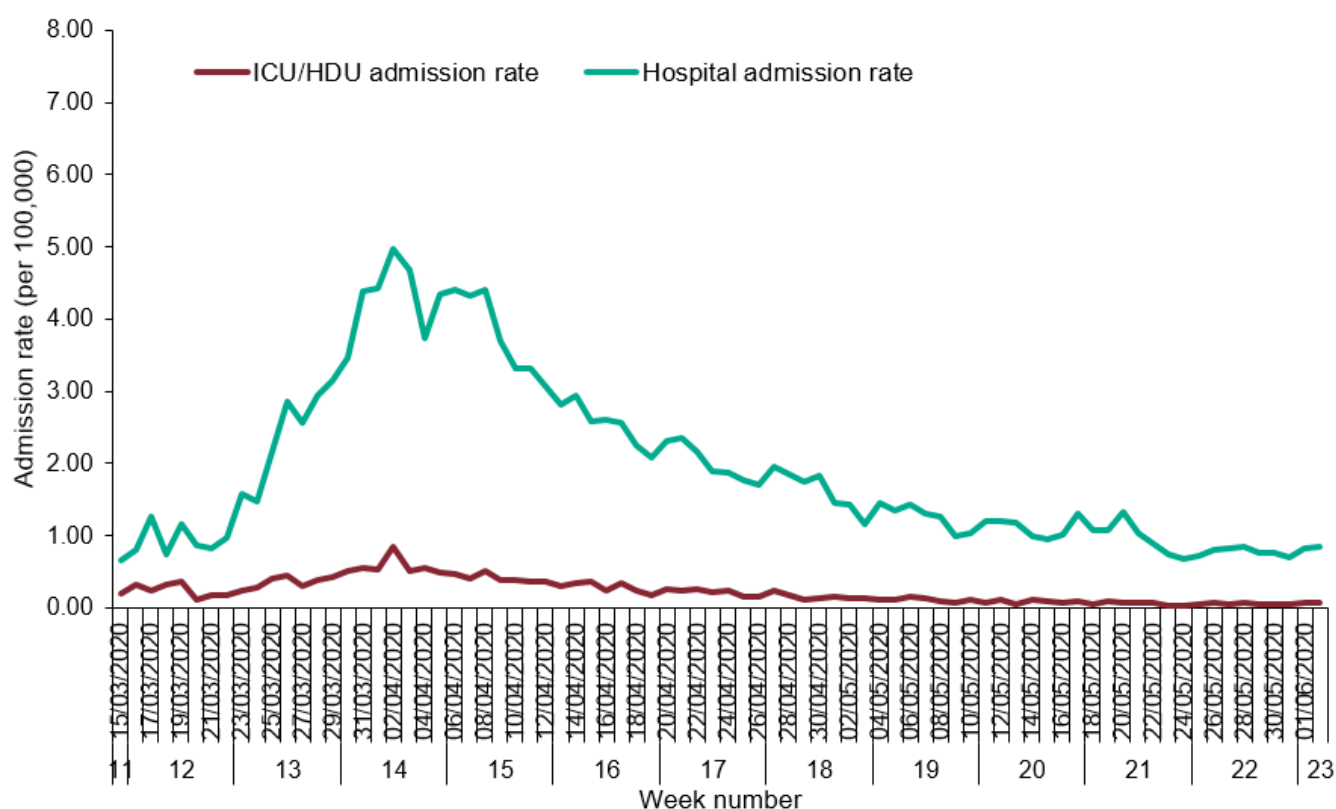
COVID-19 Hospitalisation in England Surveillance System (CHESS)

Figure 22: Daily admission rate for (a) hospital admissions and (b) ICU/HDU admissions by NHS regions (3 day moving average rate) of new COVID-19 positive cases reported through CHESS

(a)

(b)

17
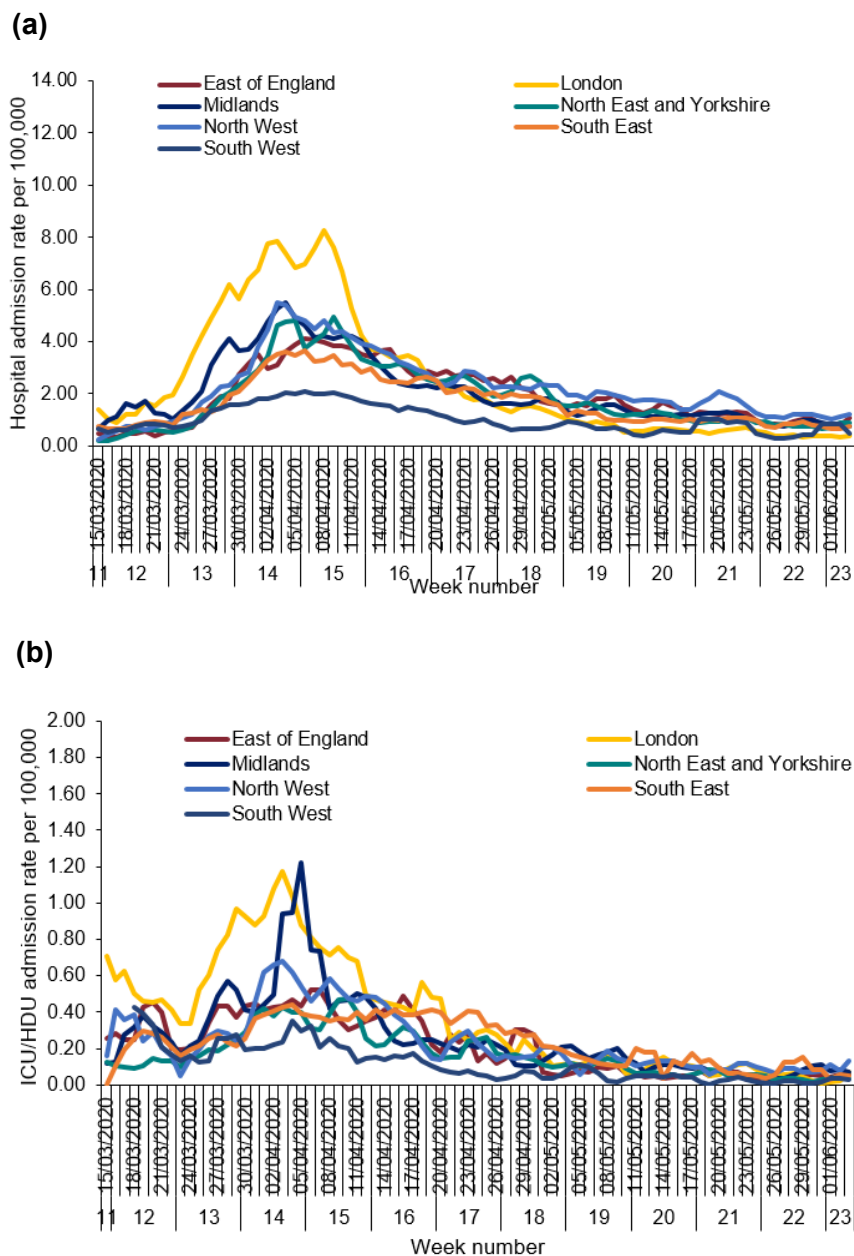
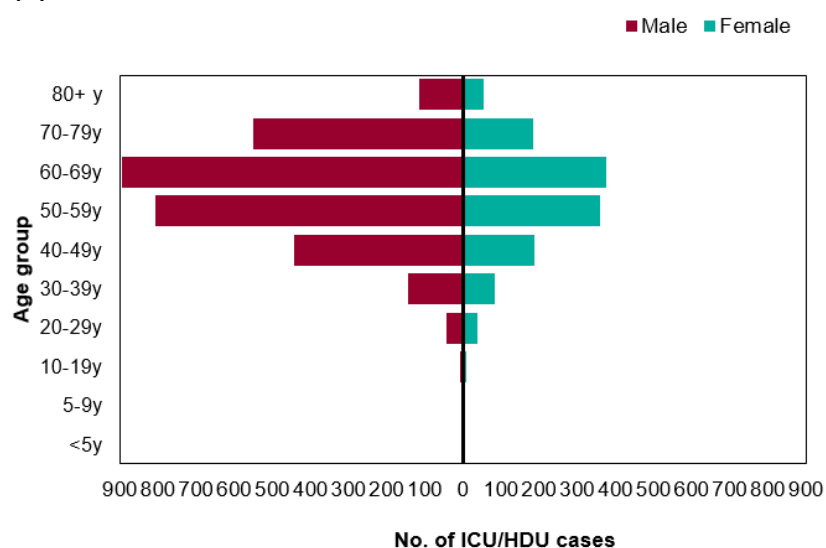## COVID-19 Hospitalisation in England Surveillance System (CHESS)

Figure 23 and 24 are based on individual patient level data which are provided to CHESS from a subset of NHS Acute Trusts, therefore the data should be interpreted with caution as the distribution of age, sex and ethnic group may not be representative of all hospitalised patients.

Figure 23: Age/sex pyramid of new (a) hospital (lower level of care) (n=8,974) and (b) ICU/ HDU (n=4,309) COVID-19 cases reported through CHESS, England
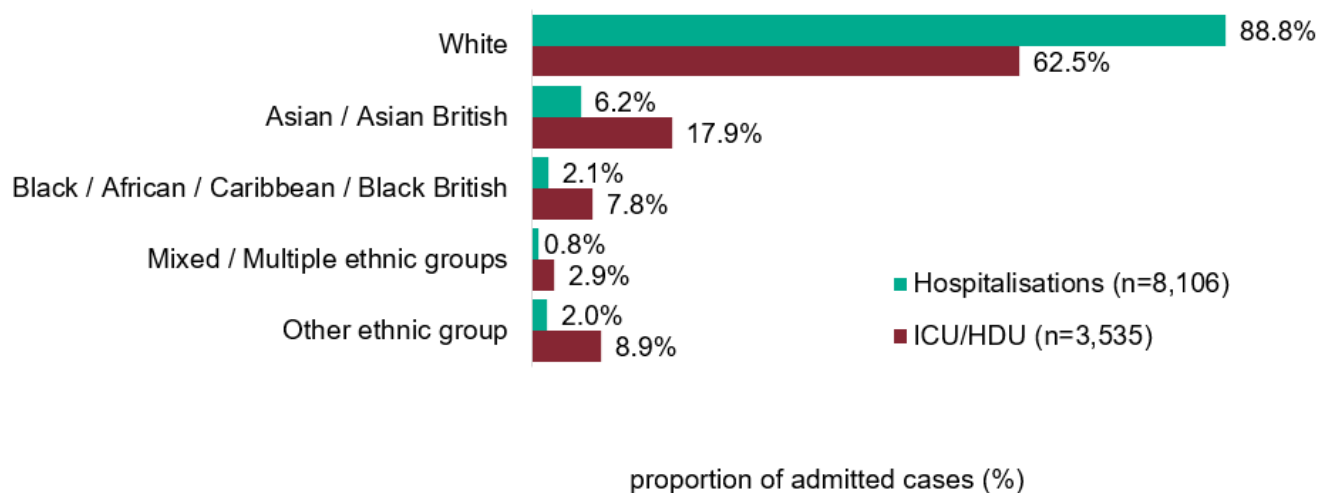
(a)

(b)

18
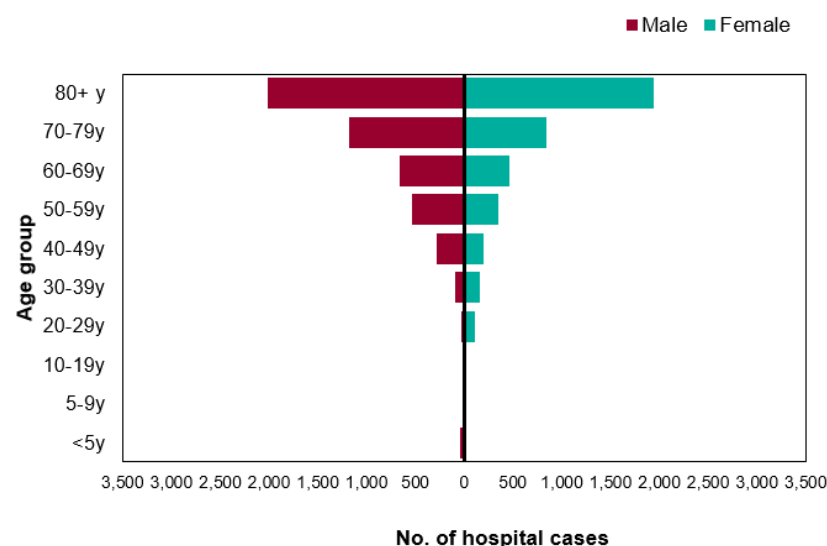
COVID-19 Hospitalisation in England Surveillance System (CHESS)

Figure 24: Ethnic group of new hospitalisations (lower level of care) (n=8,106) and ICU/HDU (n=3,535) COVID-19 cases reported through CHESS, England

UK Severe Respiratory Failure (SRF) centres admissions

Up to 03 June 2020, a total of 168 laboratory confirmed COVID-19 admissions have been reported from the 5 SRFs in England (Figure 25).

Figure 25: All COVID-19 and non-COVID-19 laboratory confirmed ECMO admissions to SRFs, UK

19
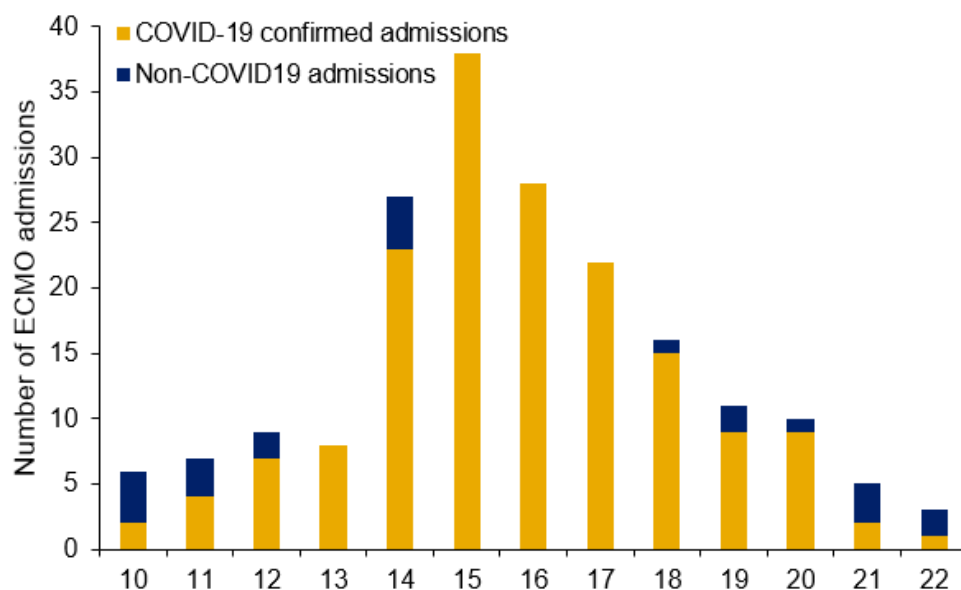
Cumulative deaths

As of 5pm on 02 June 2020, a total of 35,456 cases under Pillar 1 and 2 with confirmed COVID-19 have died in England. This is the first time, Pillar 2 deaths have been presented and have been applied retrospectively.

Figure 26: Cumulative number of deaths by date of death and age group, England (n=35,456)
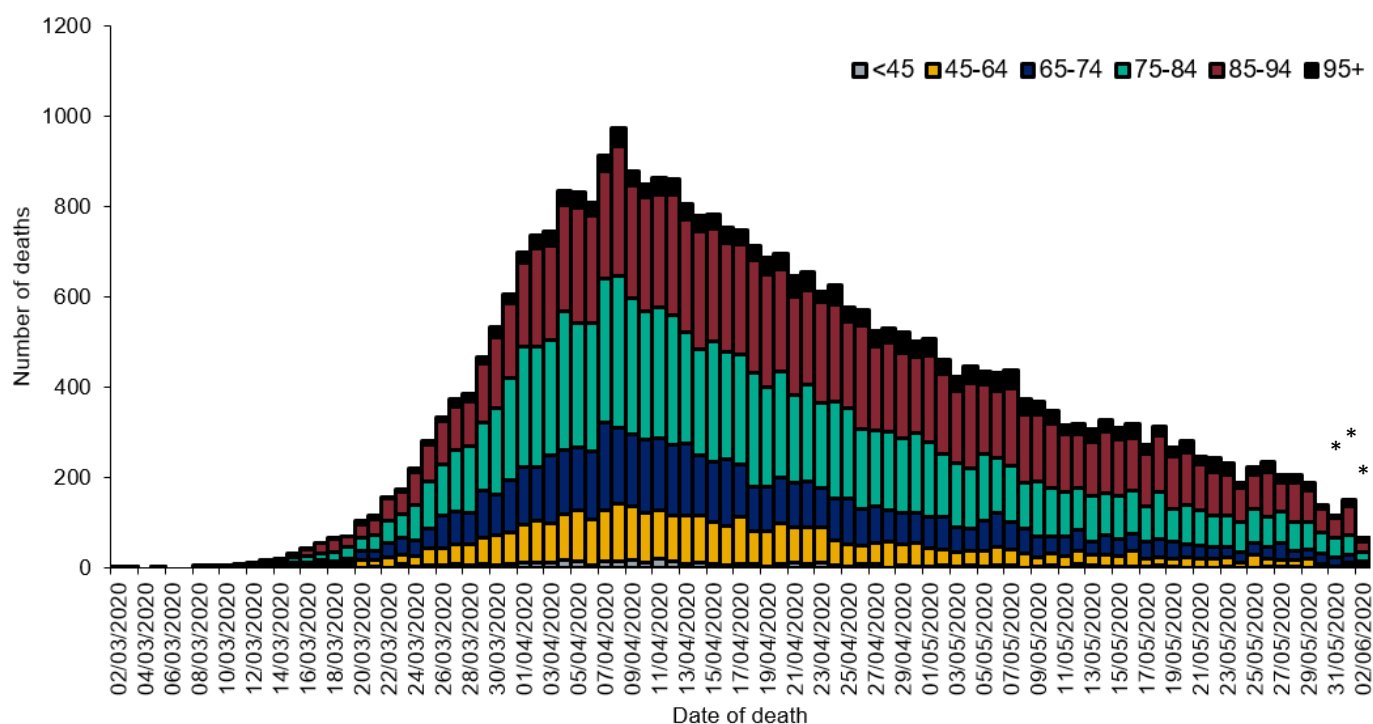
* For the most recent dates, more deaths will be reported therefore the decrease seen in this graph should be interpreted with caution

Table 3: Cumulative number of deaths (Pillar 1 and 2) by PHE Centres (n=35,081)

PHE Centres	Number of deaths
North East	2,082
North West	5,702
Yorkshire & Humber	3,295
West Midlands	4,493
East Midlands	2,659
East of England	4,017
London	6,383
South East	4,592
South West	1,858

Cumulative deaths

Figure 27: Age/sex pyramid of laboratory confirmed COVID-19 (Pillar 1 and 2) deaths (n=35,456)
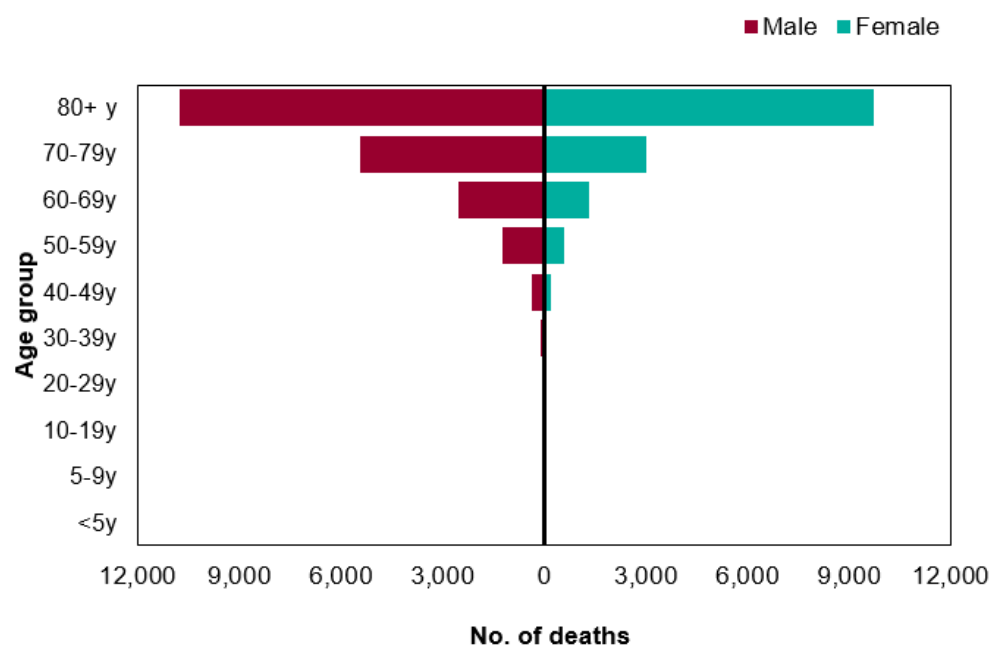
Figure 28: Ethnic group of confirmed COVID-19 (Pillar 1 and 2) deaths, England (n= 35,173)

21
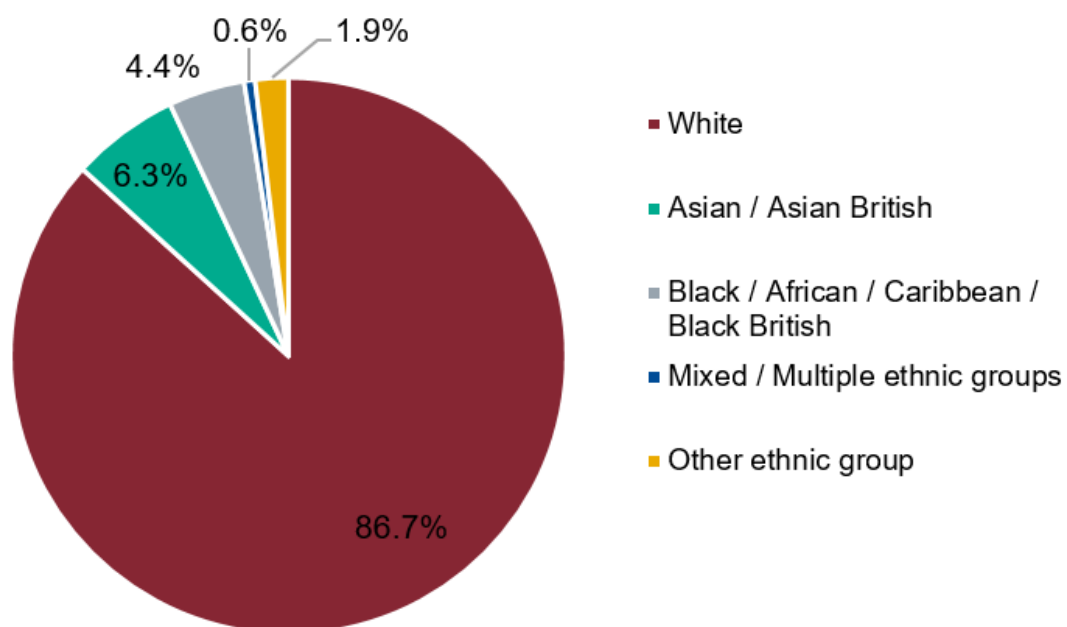
Excess all-cause mortality, UK

In week 22 2020 in England, statistically significant excess mortality by week of death above the upper 2 z-score threshold was seen overall, by age group in the 15-64 and 65+ year olds and sub nationally (all ages) in the North East, North West, Yorkshire & Humber, East & West Midlands, East of England, South East and South West regions after correcting GRO disaggregate data for reporting delay with the standardised EuroMOMO algorithm (Figure 30 and Table 4). This data is provisional due to the time delay in registration; numbers may vary from week to week.

Figure 29: Weekly observed and expected number of all-cause deaths in all ages, with the dominant circulating influenza type(s), England, 2015 to week 22 2020
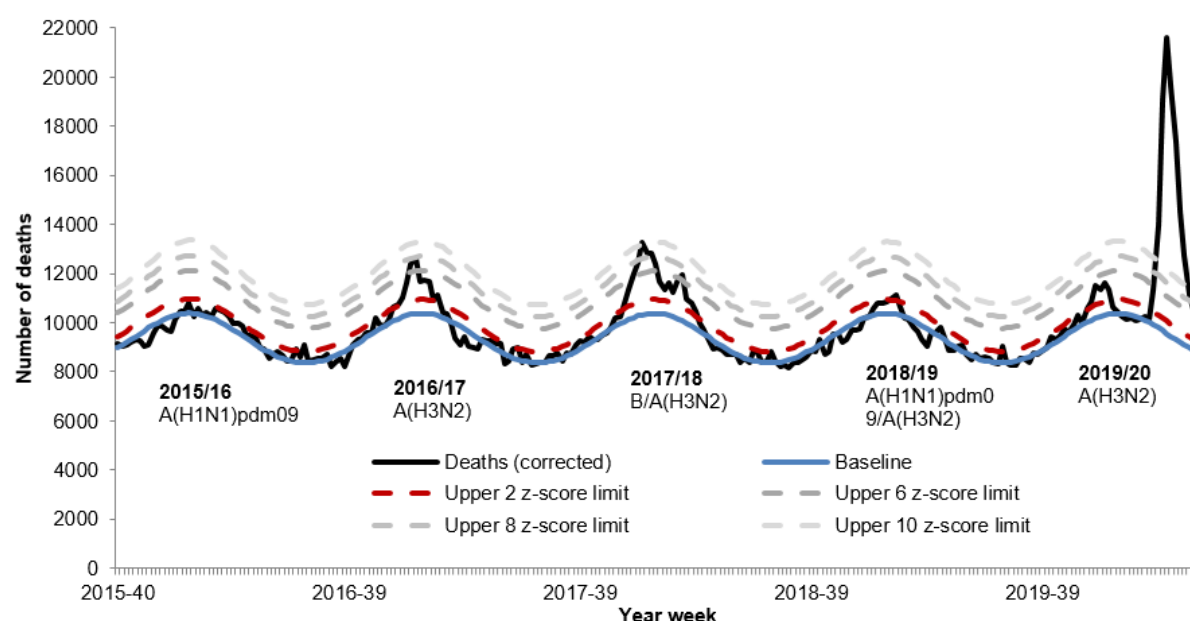
Table 4: Excess mortality by age group, England

Age group (years)	Excess detected in week 22 2020?	Weeks with excess in 2019/20
<5	x	48
5-14	x	NA
15-64	✓	02; 12-22
65+	✓	47;50-02;12-22

* Excess mortality is calculated as the observed minus the expected number of deaths in weeks above threshold

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Sero-prevalence epidemiology, England

Sero-epidemiological surveillance/studies enables the identification of the true number of infections within the general population and provides the ability to detect asymptomatic and mild infections. More information on this is available here.

Donor samples from different geographic regions (approximately 1000 samples per region) in England are tested each week. The results from testing samples from healthy adult blood donors, supplied by the NHS Blood and Transplant (NHS BT) are summarised.

The results presented are based on testing using the Euroimmun assay for samples collected between weeks 13-21.

Figure 30 shows the overall prevalence in each region over time which has been adjusted for the accuracy of the Euroimmun assay (sensitivity and specificity). It is important to note that the sensitivity and specificity of the assay is subject to change as further data becomes available.

After making adjustments based on the latest information on the accuracy of the assay and weighted by population in each region, the overall adjusted prevalence in England in May (weeks 18-21) is estimated at 8.5% (95% CI: 6.9-10%). This is based on the results of testing 7694 samples collected in individuals aged 17-69 years across the country during May 2020. Overall adjusted prevalence was 1.8% higher in males (9.4%) compared with females (7.6%) (Table 5).

Adjusted prevalence estimates vary across the country and over time. In London where prevalence estimates are highest, overall adjusted prevalence increased from 1.3% (week 13) to 10.6% (weeks 15-16) to 14.8% (week 18) and most recently to 15.6% (week 21). Given that antibody response takes at least two weeks to become detectable, those displaying a positive result in week 18 are likely to have become infected before mid-April. The plateauing observed between weeks 18-21 demonstrates the impact of lock down measures on new infections.

The lower prevalence in samples from other regions including the South East, South West and North East regions is consistent with data from other surveillance systems.

In some regions prevalence estimates in recent weeks have been lower in more recent weeks. For example in The Midlands, the adjusted prevalence increased from 1% (week 14) to 6.4% (week 17) but was slightly lower in week 20 at 5% (week 20). A lower prevalence has also been observed in the most recent samples from the South West region, which was at 4% in week 17 and only 2.6% in week 21. This is likely driven by some changes in the precise locations of donor sampling over time with the most recent set of samples from both regions containing significantly fewer samples from higher prevalence areas e.g. in the most recent set from Midlands there were significantly less samples from Birmingham, an area of higher prevalence than the rest of the region.

There was some variation in the adjusted prevalence estimates by age group across England (Table 5) with the highest prevalence in adolescent and adolescents and young adults (10.2%) and the lowest prevalence in those aged 60-69 years (6.3%). However, the age specific prevalence estimates have changed over time with prevalence notably higher in the young adults when the increases were first observed in areas experiencing the outbreak earlier. Over time however the increase was seen amongst older adults suggesting this age group were being affected later. In the most recent data from London and South West (week 21), a higher prevalence was again seen in the 17-29-year-old age group. These patterns may reflect differences in behaviour and mixing patterns in the different age groups.

Sero-prevalence epidemiology, England

Figure 30: Overall SARS-CoV-2 antibody seroprevalence (%) in blood donors by PHE centres, using Euroimmun test adjusted for sensitivity (79%) and specificity (99%) and 95% confidence intervals (dashed lines)
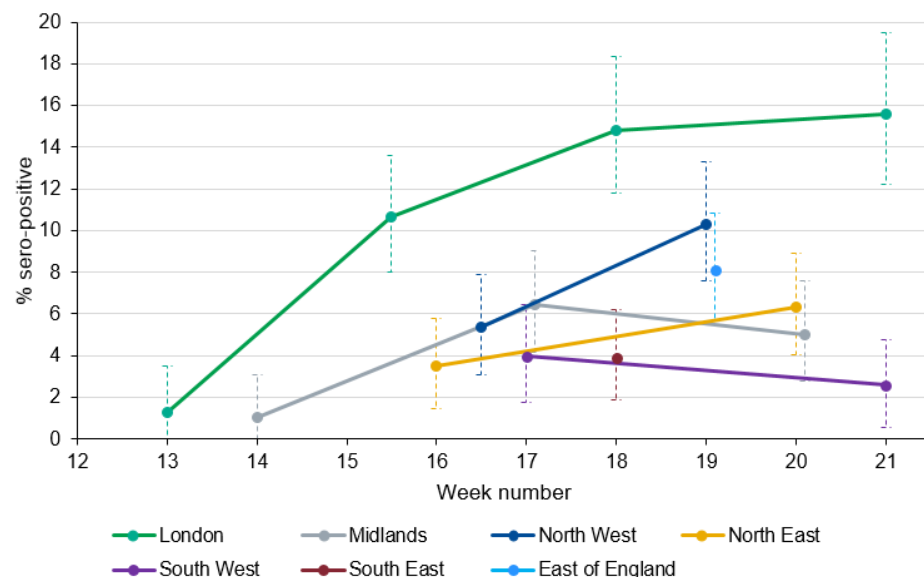
Table 5: Adjusted prevalence estimates for England, by age group and gender, weeks 18 to 21 2020

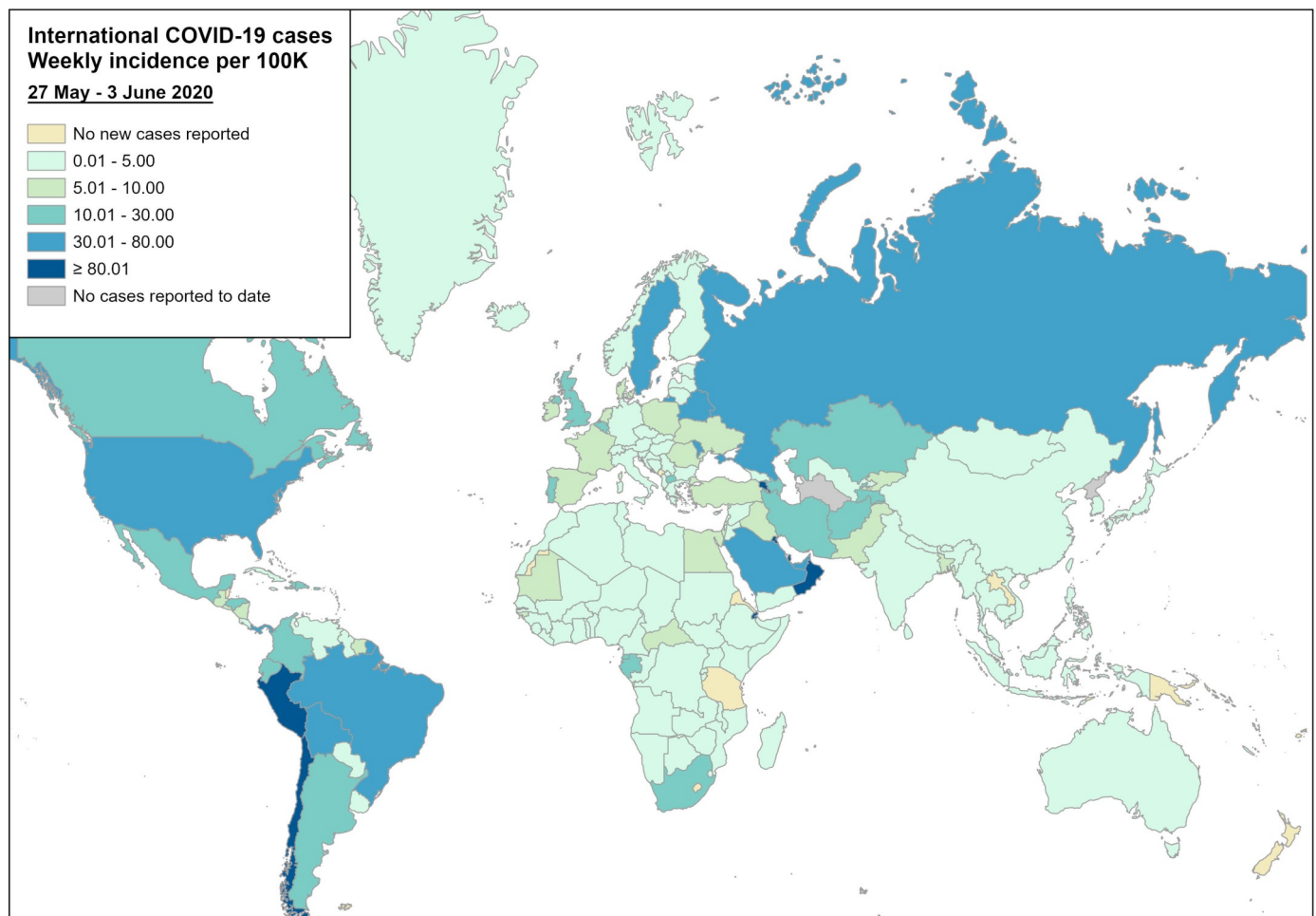| Group	Weighted adjusted prevalence (%) with 95% credible intervals
Overall	8.5% (6.9% - 10.0%)
Age group (years)	
17-29	10.2% (8.0% - 12.6%)
30-39	9.3% (7.2% - 11.3%)
40-49	7.9% (5.9% - 9.9%)
50-59	7.8% (5.8% - 9.7%)
60-69	6.3% (4.3% - 8.2%)
Sex	
Female	7.6% (5.9% - 9.2%)
Male	9.4% (7.5% - 11.2%)

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Global situation

Globally, up to 03 June 2020, a total of 6,326,683 cases of COVID-19 infection have been reported worldwide, including 379,242 COVID-19 related deaths.

Figure 31: Global map of cumulative COVID-19 cases
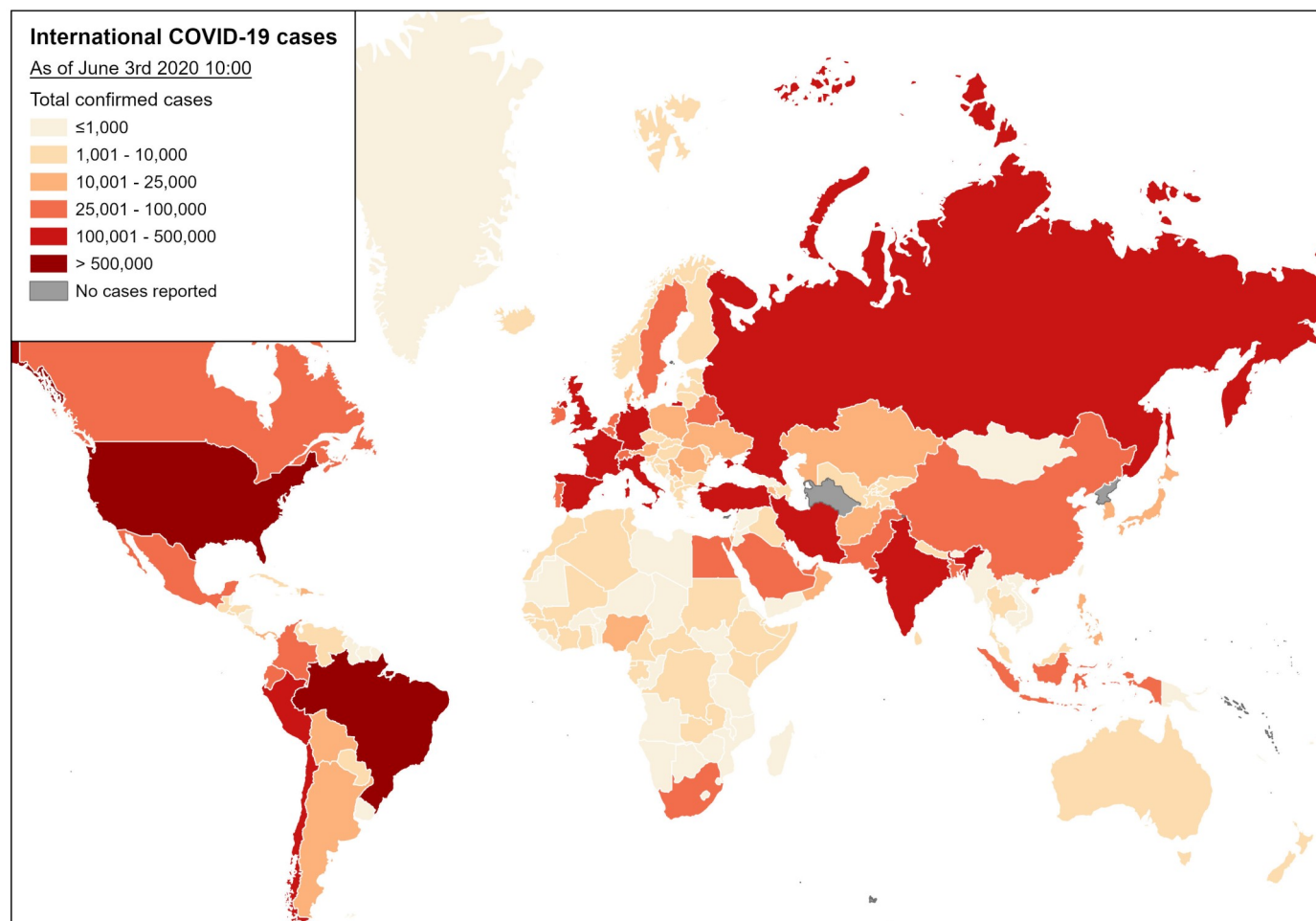
Global situation

Figure 32: Global map of weekly COVID-19 case incidence rate per 100,000, week 22 2020

**International COVID-19 cases
Weekly incidence per 100K**
<u>27 May - 3 June 2020</u>

- No new cases reported
- 0.01 - 5.00
- 5.01 - 10.00
- 10.01 - 30.00
- 30.01 - 80.00
- ≥ 80.01
- No cases reported to date

PHE has delegated authority, on behalf of the Secretary of State, to process Patient Confidential Data under Regulation 3 The Health Service (Control of Patient Information) Regulations 2002

http://www.legislation.gov.uk/uksi/2002/1438/regulation/3/made. Regulation 3 makes provision for the processing of patient information for the recognition, control and prevention of communicable disease and other risks to public health.