



One of PHE's core functions is disease surveillance, which involves the gathering and analysis of a variety of data about a disease from a range of sources to understand how the outbreak of a disease affects a country and its regions. Surveillance is also undertaken to inform decisions and actions across the public health system.

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

The report is based on week 18 (data between 27 April and 03 May 2020) and where available daily data up to 06 May 2020.

COVID-19 is the disease name and SARS-CoV-2 is the virus name.

As of 09:00 on 06 May 2020, there have been a total of 129, 799 laboratory confirmed cases of COVID-19 in England.

Community surveillance:	<ul style="list-style-type: none"> a total of 721 acute respiratory outbreaks have been reported in week 18, of which 256 (243 in care homes, 6 in hospitals, 2 in schools and 5 in other settings) were confirmed SARS-CoV-2 outbreaks
Primary care surveillance:	<ul style="list-style-type: none"> the overall RCGP swabbing positivity for week 17 was 14.0% compared to 16.7% in the previous week through the syndromic surveillance systems, potential COVID-19 indicators through the NHS 111 service (calls and online assessments) and GP in Hours (consultations) remained stable through GP out of hours, daily percentages for difficulty breathing and ILI decreased data across all syndromic surveillance systems should be treated with caution because of recent guidance on where the public should seek health care and changes in coding
Secondary care surveillance:	<ul style="list-style-type: none"> the hospital admission rate through CHES was at 1.37 per 100,000 (06 May 2020) compared to 1.84 per 100,000 for the same day (29 April 2020) in the previous week the ICU/HDU admission rate through CHES was at 0.15 per 100,000 (06 May 2020) compared to 0.21 per 100,000 (29 April 2020) for the same day in the previous week a total of 139 laboratory confirmed COVID-19 admissions have been reported from the 5 Severe Respiratory Failure (SRF) Centres in England
Virological surveillance:	<ul style="list-style-type: none"> the overall % positivity through the SGSS and Respiratory DataMart was 1.6% in week 18 (based on daily data up to 05 May 2020) compared to 11.7% for the same day (28 April 2020) in the previous week
Mortality surveillance:	<ul style="list-style-type: none"> statistically significant excess all cause mortality was observed in week 18 in England by age in the 15 to 64 and 65+ year olds and subnationally (all ages) in all regions

SARS-CoV-2 testing started in UK laboratories on 24 January 2020. This data is reported through a combination of laboratory systems (SGSS and Respiratory DataMart). The majority of testing to date has been offered to those in hospital with a medical need as well as NHS key workers, rather than the general population. Confirmed cases therefore represent the typical population of people with severe disease, rather than all of those who get infected. From 24 April 2020, eligibility for testing was expanded to include other non-NHS key workers and subsequently those who cannot work from home, anyone aged over 65 years with symptoms and, household contacts of eligible groups and staff and residents in care homes."

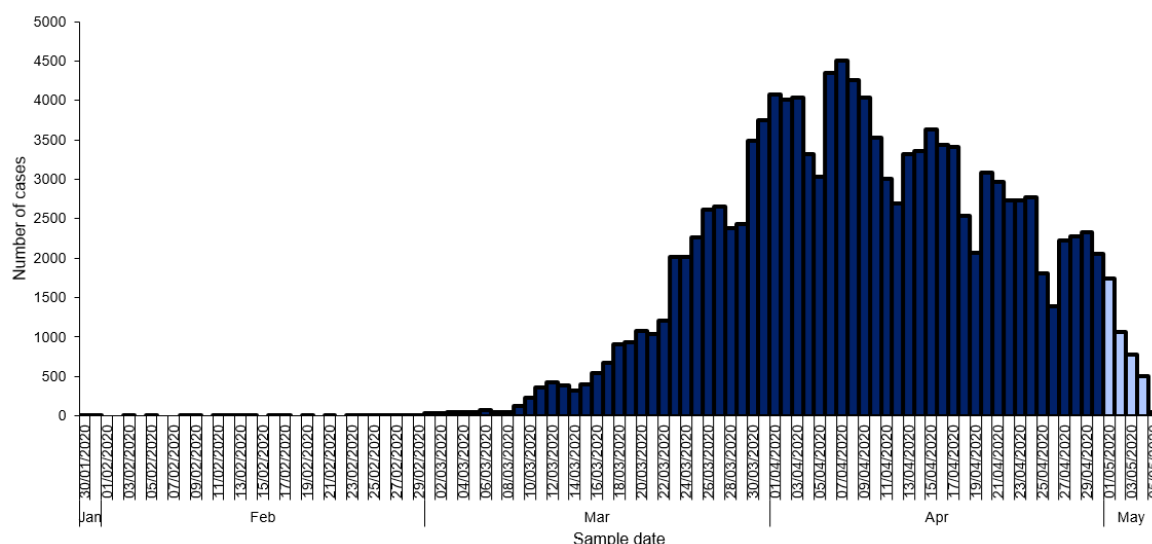
As of 09:00 on 06 May 2020, a total of 543,801 people have been tested, of which 129,799 have been confirmed positive for COVID-19 in England.

Figure 1 and 2 reflect only numbers tested under Pillar 1 (swab testing in PHE labs and NHS hospitals for those with a clinical need, and health and care workers).

Figure 1 is an epidemic curve presenting data by date of sample which represents the true trend in the progression of diagnosed cases overtime.

Figure 2 is an age/sex population pyramid which represents disease in confirmed cases across different age groups.

Figure 1: Laboratory confirmed COVID-19 cases, by date of sample (n=129,799)



* For the most recent dates (in light blue), 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.

Figure 2: Age/sex pyramid of laboratory confirmed COVID-19 cases (n=127,882)

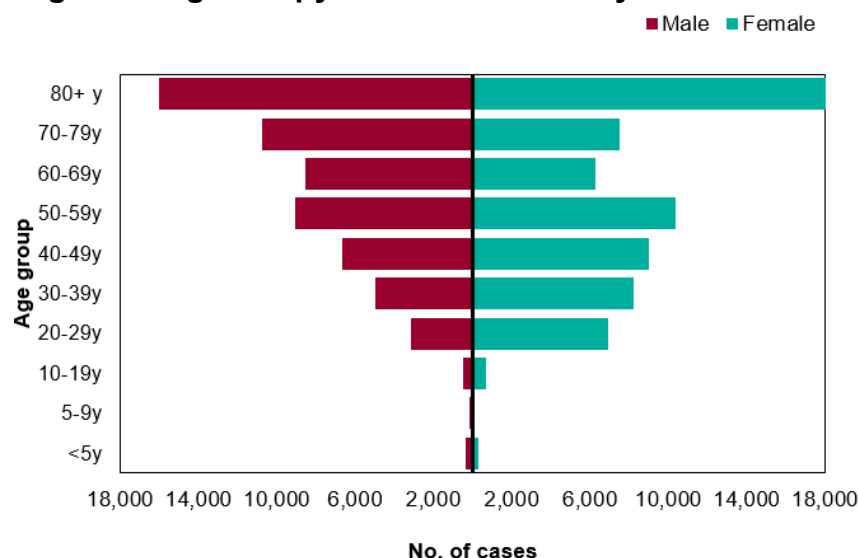


Figure 3: Ethnic group of laboratory confirmed COVID-19 cases (n= 117,150)

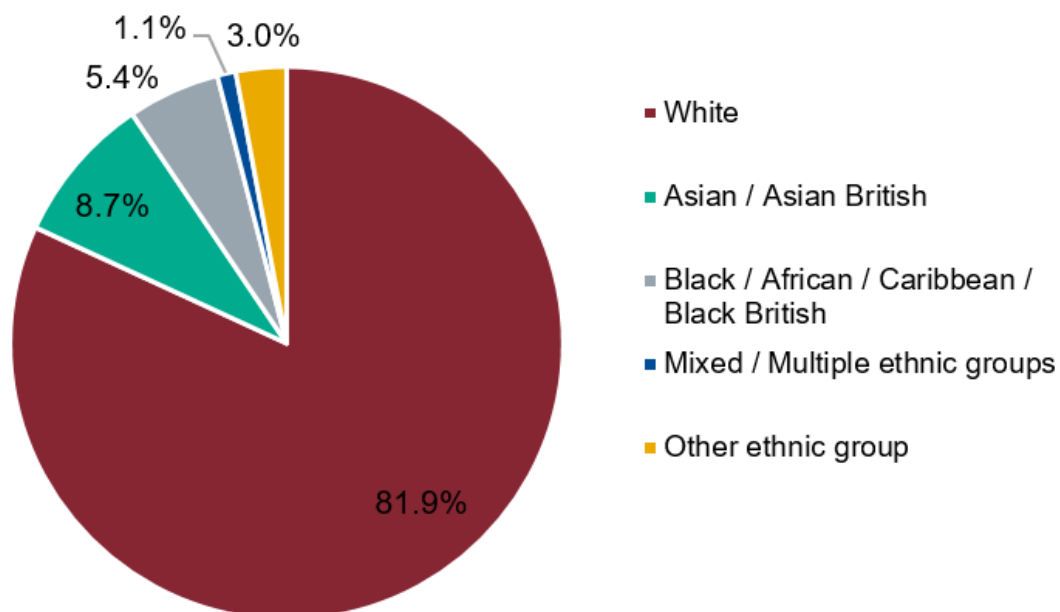
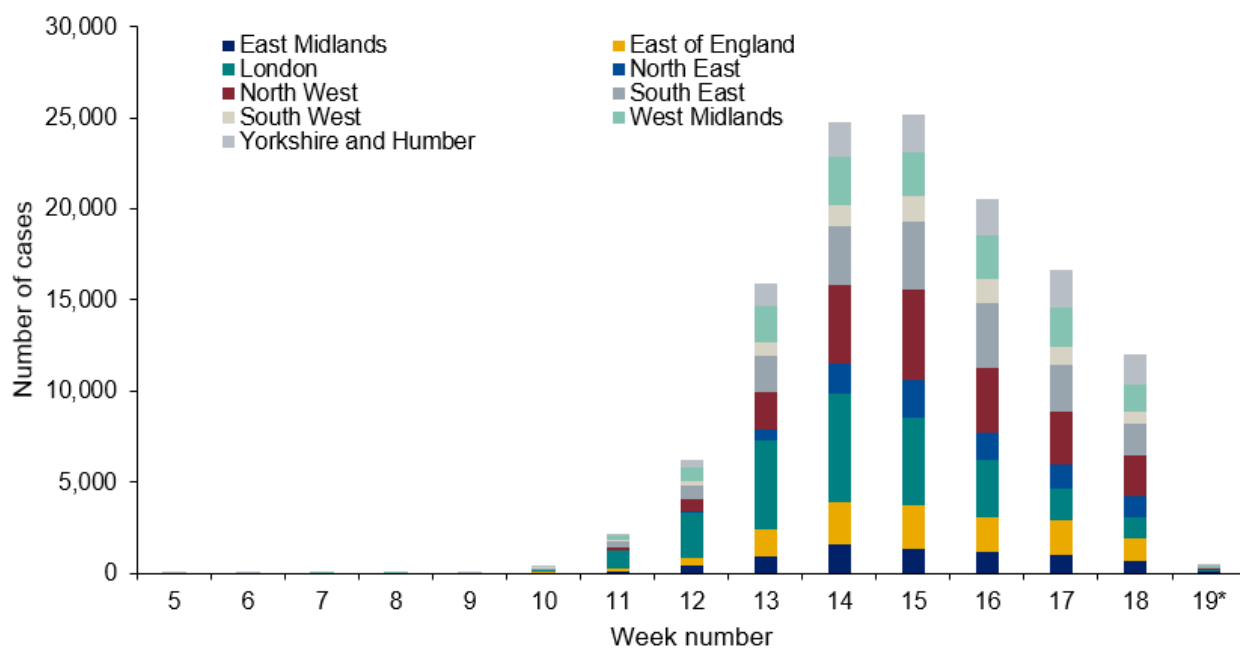


Table 1: Cumulative total number of cases by PHE Centres (n=124,297)

PHE Centres	Cases
North East	8,395
North West	21,000
Yorkshire & Humber	11,477
West Midlands	14,151
East Midlands	7,292
East of England	11,874
London	25,357
South East	18,025
South West	6,726

Figure 4: Laboratory confirmed COVID-19 cases, by PHE Centres and sample date week (n= 124,297)



* Data from week 19 refers to cases from Monday to Wednesday only therefore more samples are expected and the decrease seen in this graph should be interpreted with caution

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

Acute respiratory outbreaks, England

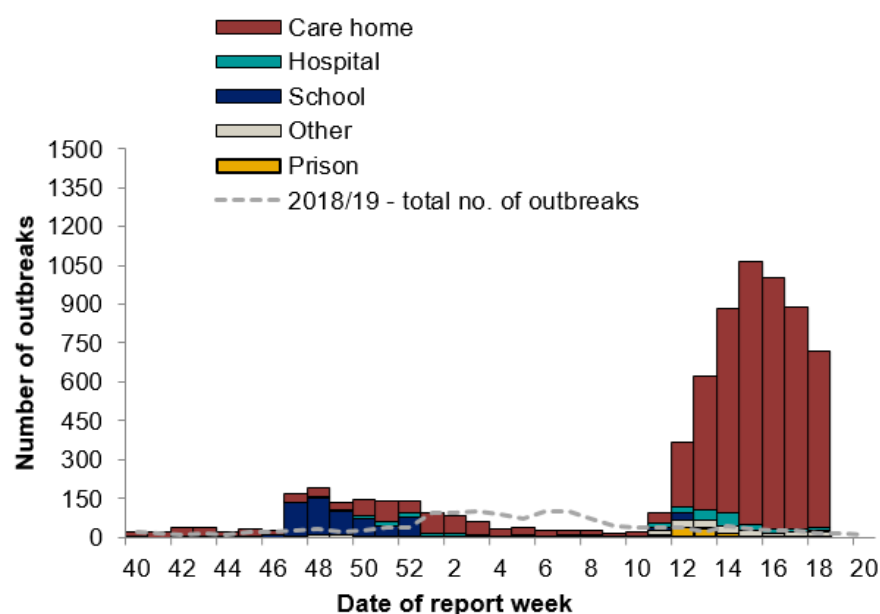
Information on acute respiratory outbreaks is collected by PHE's Health Protection Teams (HPTs).

An outbreak is defined as two or more people experiencing a similar illness, which appears to be linked to a particular setting.

721 new acute respiratory outbreaks have been reported in week 18 (Figure 5):

- 686 outbreaks were from care homes where 243 tested positive for SARS-CoV-2
- 9 outbreaks were from hospitals where 6 tested positive for SARS-CoV-2
- 3 outbreaks were in schools where 2 tested positive for SARS-CoV-2
- 1 outbreak was in a prison
- 22 outbreaks were from the Other Settings category where 5 tested positive for SARS-CoV-2

Figure 5: 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.

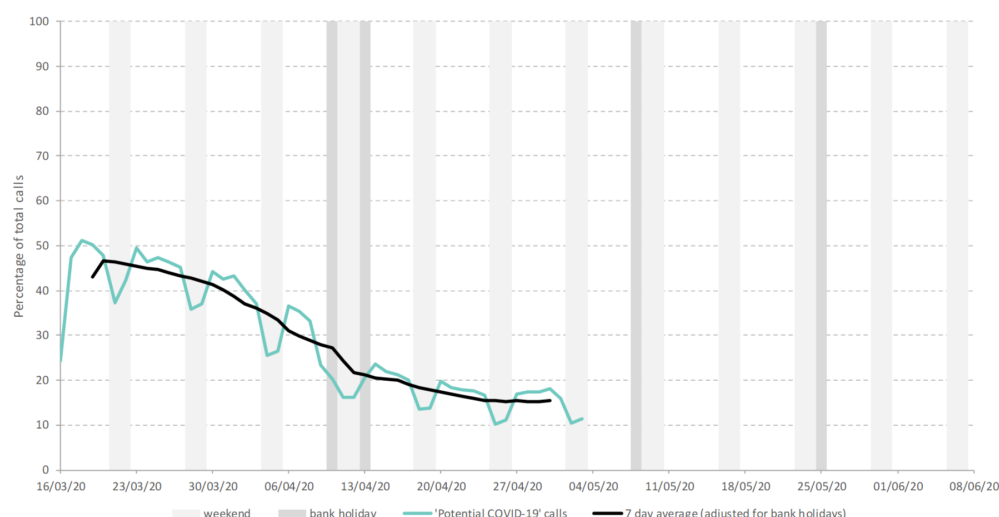
Up to 03 May 2020, the daily percentage of NHS 111 'potential COVID-19-like calls (as a percentage of total NHS 111 calls) remained stable (Figure 6). The daily number of NHS 111 'potential COVID-19' completed online assessments also remained stable (Figure 6).

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.

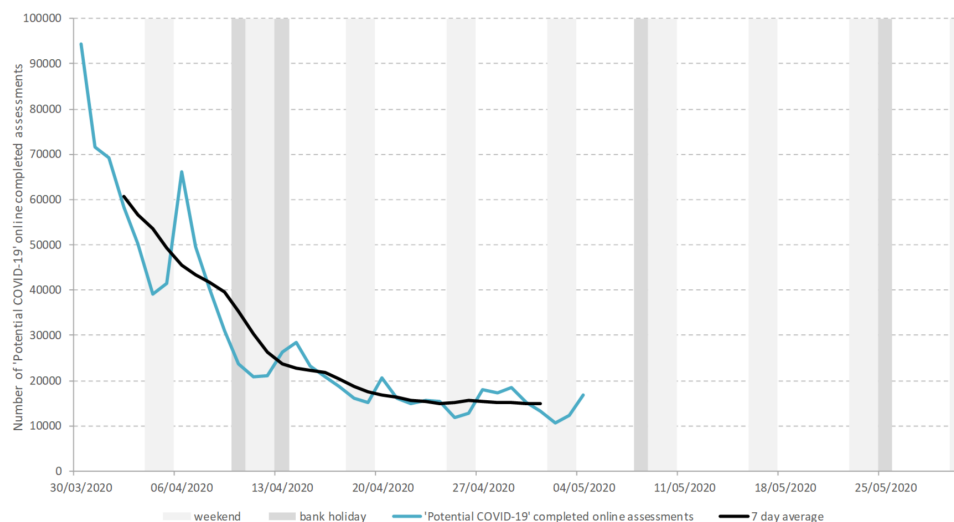
Further information about these caveats is available from the [PHE Remote Health Advice Syndromic Surveillance](#) bulletin.

Figure 6 (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.

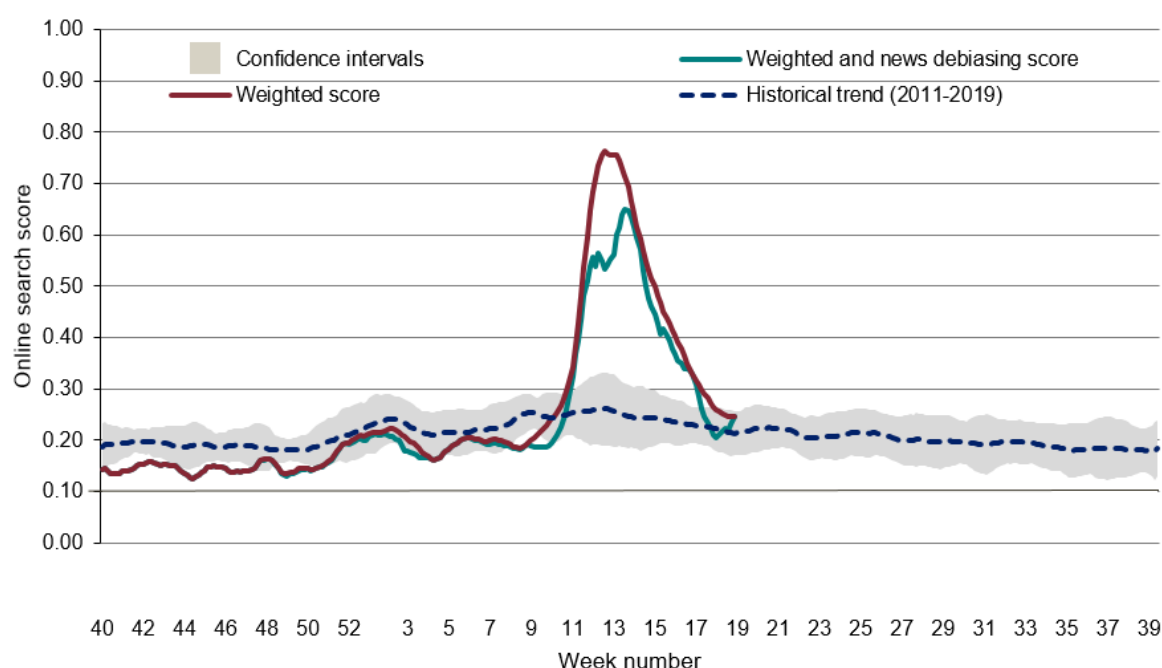
Google search queries

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 weighted score continued to decrease, whereas the media de-biasing weighted score increased slightly in week 18 (Figure 7).

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

Figure 7: Normalised Google search score for COVID-19 symptoms, with weighted score for media-de-biasing and historical trend, England



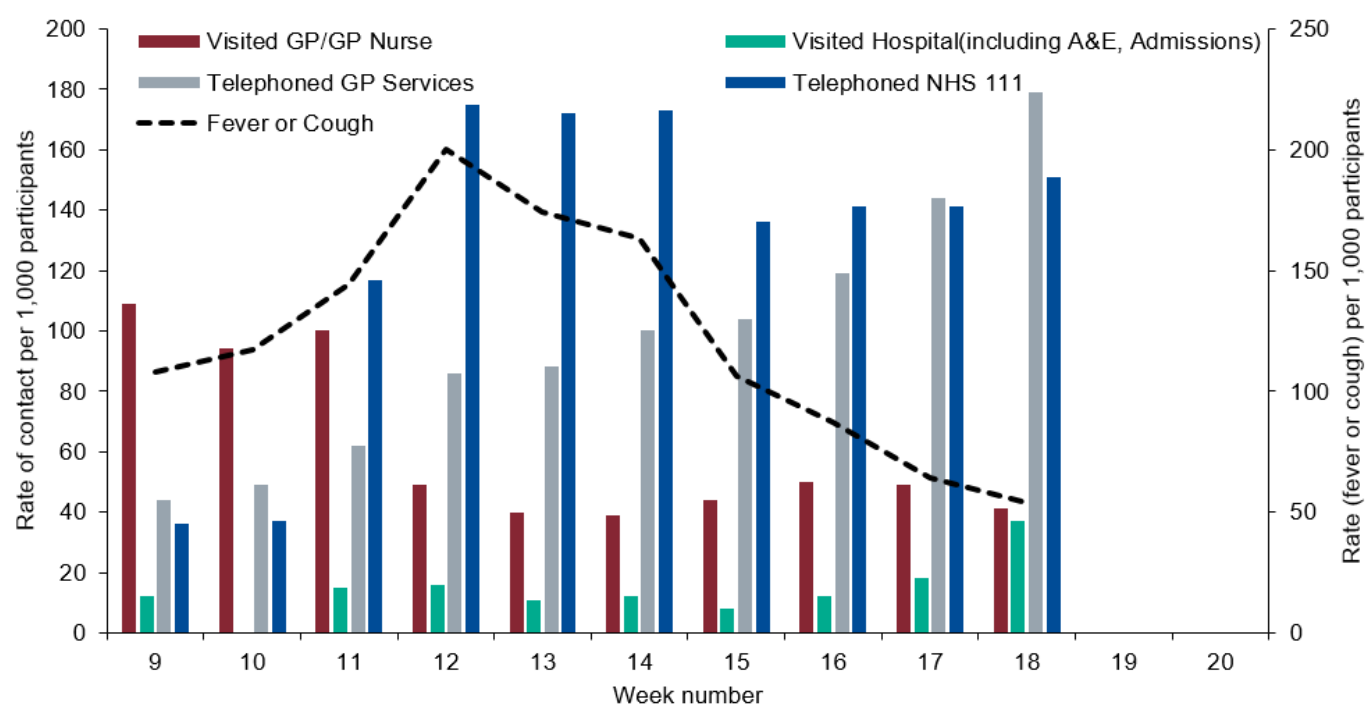
Internet based surveillance

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 4,044 participants completed the weekly COVID-19 surveillance survey in week 18. The proportion of participants reporting cough or fever continued to decrease while the most commonly reported method of access to healthcare services was through telephone services (Figure 8), which is in line with current government recommendations.

Figure 8: Rate of contact with different healthcare services among FluSurvey participants reporting fever or cough symptoms, week 09 to 18, England



GP In Hours (GPIH), Syndromic surveillance

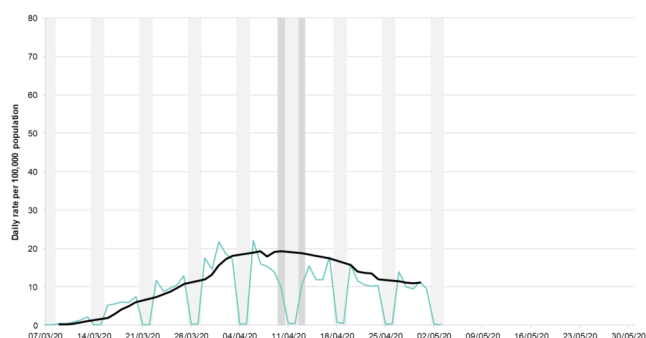
The [GP In Hours \(GPIH\) syndromic surveillance system](#) monitors the number of GP visits during regular hours of known clinical indicators. This system covers around 55% of England's population.

Figure 9 (a-d) represents daily incidence rates for all ages in England for (a) potential COVID-19 GP consultations, (b) ILI, (c) pneumonia and (d) lower respiratory tract infection (LRTI), with a 7-day moving average for each respectively.

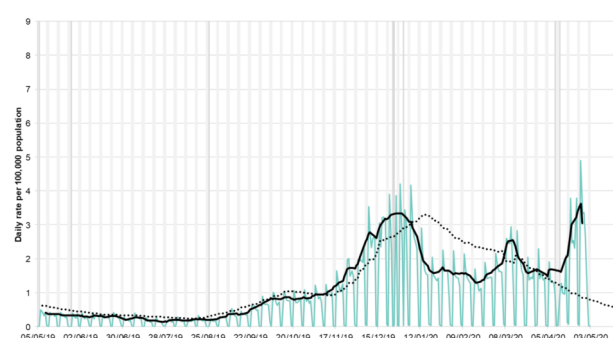
Up to 03 May 2020, COVID-19-like GP consultations remained stable, while pneumonia and LRTI consultations decreased slightly (Figure 9). Please note GP data should be interpreted with caution due to changes in advice regarding accessing GP surgeries due to COVID-19. A new COVID-19 Care Pathway template has been introduced into GP systems that has affected recording of influenza-like illness (ILI), resulting in an increase in consultation rates for ILI (Figure 9(b)). Further information about these caveats is available from the [PHE GP In Hours Syndromic Surveillance](#) bulletin.

Figure 9 (a-d): GPIH clinical indicators, England

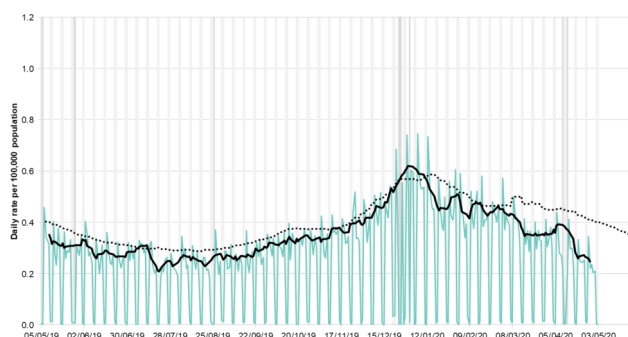
(a) Potential COVID-19 GP consultations, daily incidence rates per 100,000 population, all ages, England



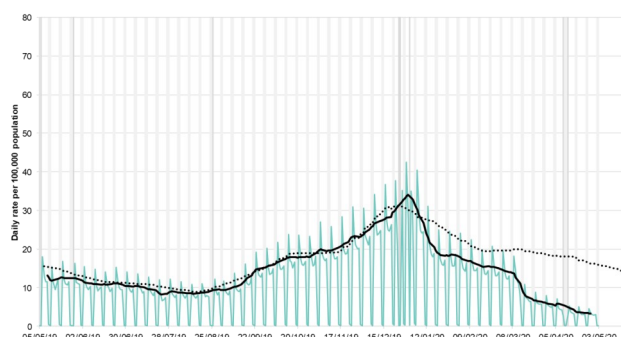
(b) Influenza-like illness, daily incidence rates per 100,000 population, all ages, England



(c) Pneumonia, daily incidence rates per 100,000 population, all ages, England



(d) LRTI, daily incidence rates per 100,000 population, all ages, England



weekend
 bank holiday
 indicator
 7 day mov avg
 baseline

GP Out of Hours (GPOOH), Syndromic surveillance

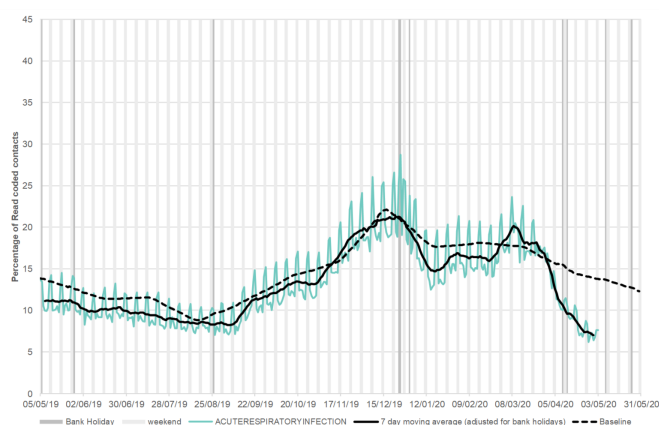
The [GP Out of Hours \(GPOOH\) syndromic surveillance system](#) monitors the numbers of daily unscheduled visits and calls to GPs during evenings, overnight, on weekends and on public holidays. This system covers approximately 70% of England's out of hours activity and complements the existing GP surveillance systems that cover daily daytime consultations.

Figure 10 (a-c) represents the daily percentage (as a percentage of total contacts with a Read code) for all ages in England for (a) acute respiratory infection (ARI) (b) difficulty breathing/wheeze/asthma and (c) influenza-like illness with a 7-day moving average for each respectively.

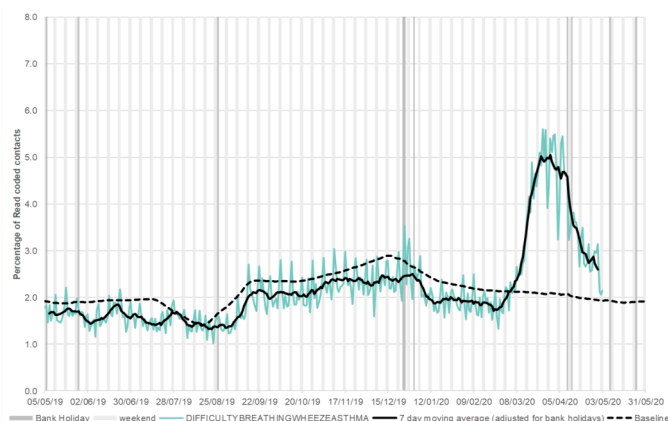
Up to 03 May 2020, the daily percentages for ARI, difficulty breathing/wheeze/asthma and ILI all decreased (Figure 10).

Figure 10 (a-c): GPOOH indicators, England

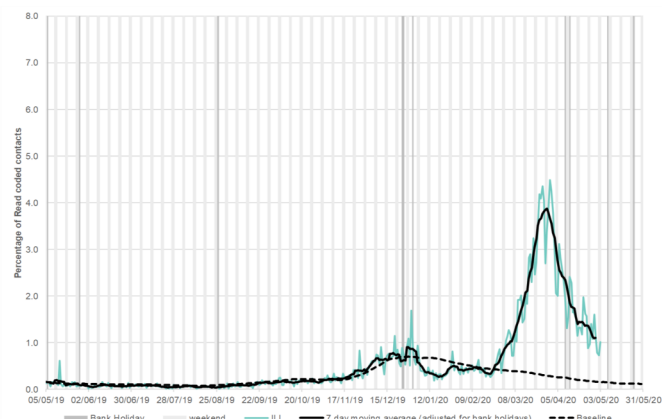
(a) Acute Respiratory Infection, daily contacts, all ages, England



(b) Difficulty breathing/wheeze/asthma, daily contacts, all ages, England



(c) Influenza-like illness (ILI), daily contacts, all ages, England

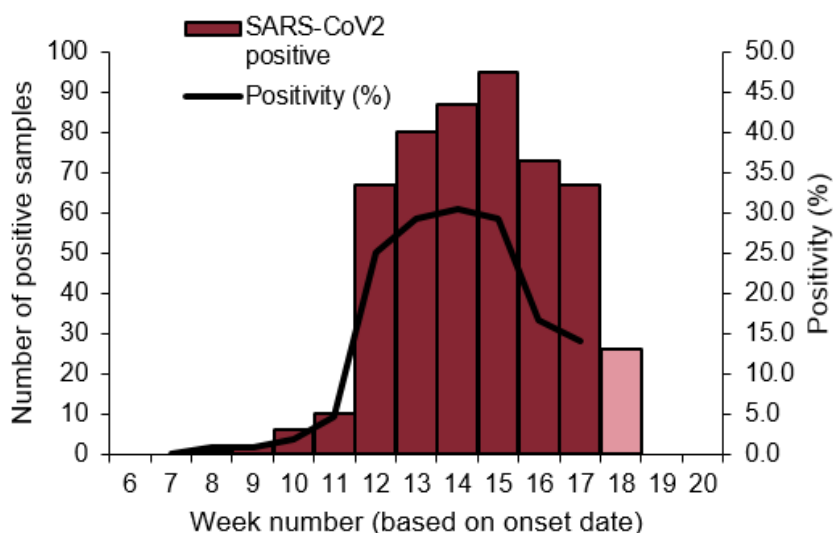


RCGP Swabbing Scheme

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 ILI and LRTI (not suspected for COVID-19) will be sampled. 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 06 May 2020, a total of 3,144 patients have been tested of which 513 have tested positive for SARS-CoV-2 through this scheme. The overall positivity for week 17 was 14.0% compared to 16.7% in the previous week (Figure 11). The highest positivity by PHE region was noted in the North region (Figure 12). The highest positivity by age group was observed in the 65+ year olds and 45-64 year olds and by gender in males (Figure 13).

Figure 11: Overall positivity (%) (weekly) and number of SARS-CoV-2 positive samples, England (RCGP)



For week 18 (in light red), more samples are expected to be tested therefore the decrease seen in this graph should be interpreted with caution

RCGP Swabbing Scheme

Figure 12: Overall positivity (%) (weekly) by PHE Region, England (RCGP)

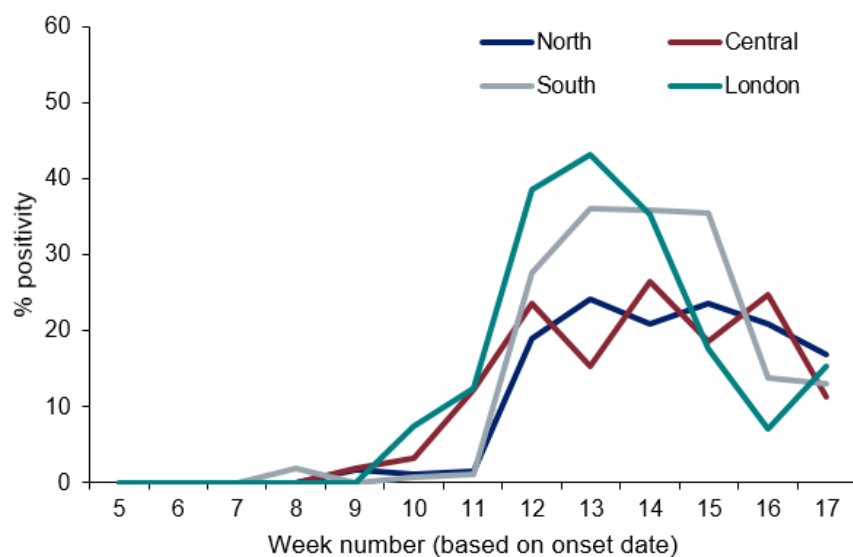
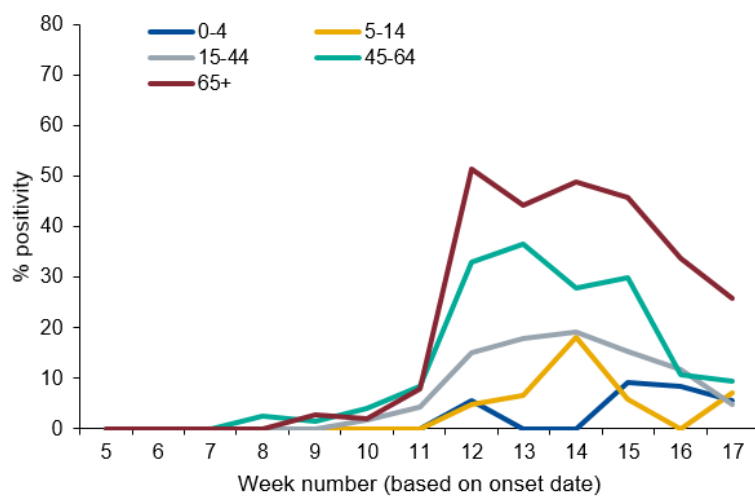
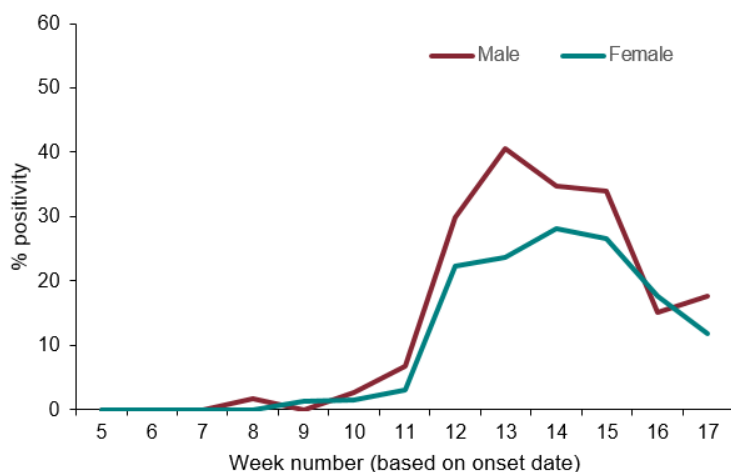


Figure 13: Positivity (%) (weekly) by (a) age group and (b) gender, England (RCGP)

(a)



(b)



Emergency Department attendances, Syndromic surveillance

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

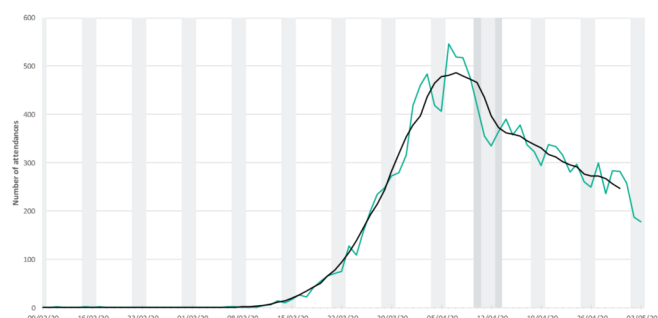
Figure 14 (a-c) represents the daily number of ED attendances for all ages as reported by 80 EDs in England during week 18 for (a) COVID-19-like attendances (b) acute respiratory infection (ARI) and (c) pneumonia with a 7-day moving average for each respectively.

Up to 03 May 2020, the daily number of ARI attendances decreased, although pneumonia attendances remained stable.

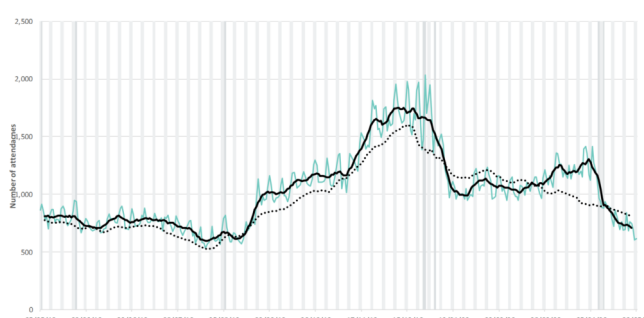
Please note: the COVID-19-like ED indicator is an underestimation of number of COVID-19 attendances as it only includes attendances with a COVID-19-like diagnosis as their primary diagnosis. The EDSSS COVID-19-like indicator should therefore be used to monitor trends in ED attendances and not to estimate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

Figure 14 (a-c): EDSSS indicators, England

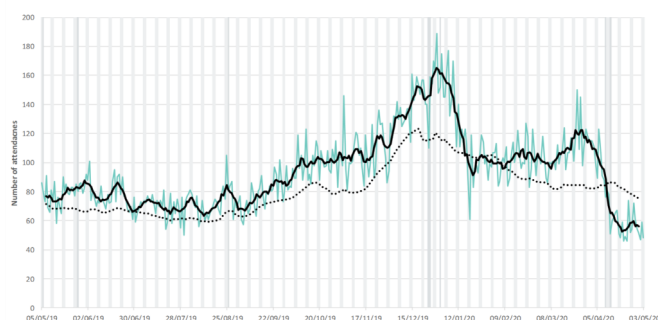
(a) COVID-19-like, daily ED attendances, all ages, England



(b) Acute Respiratory Infection, daily ED attendances, all ages, England



(c) Pneumonia, daily ED attendances, all ages, England



weekend
 bank holiday
 indicator
 7 day mov avg
 baseline

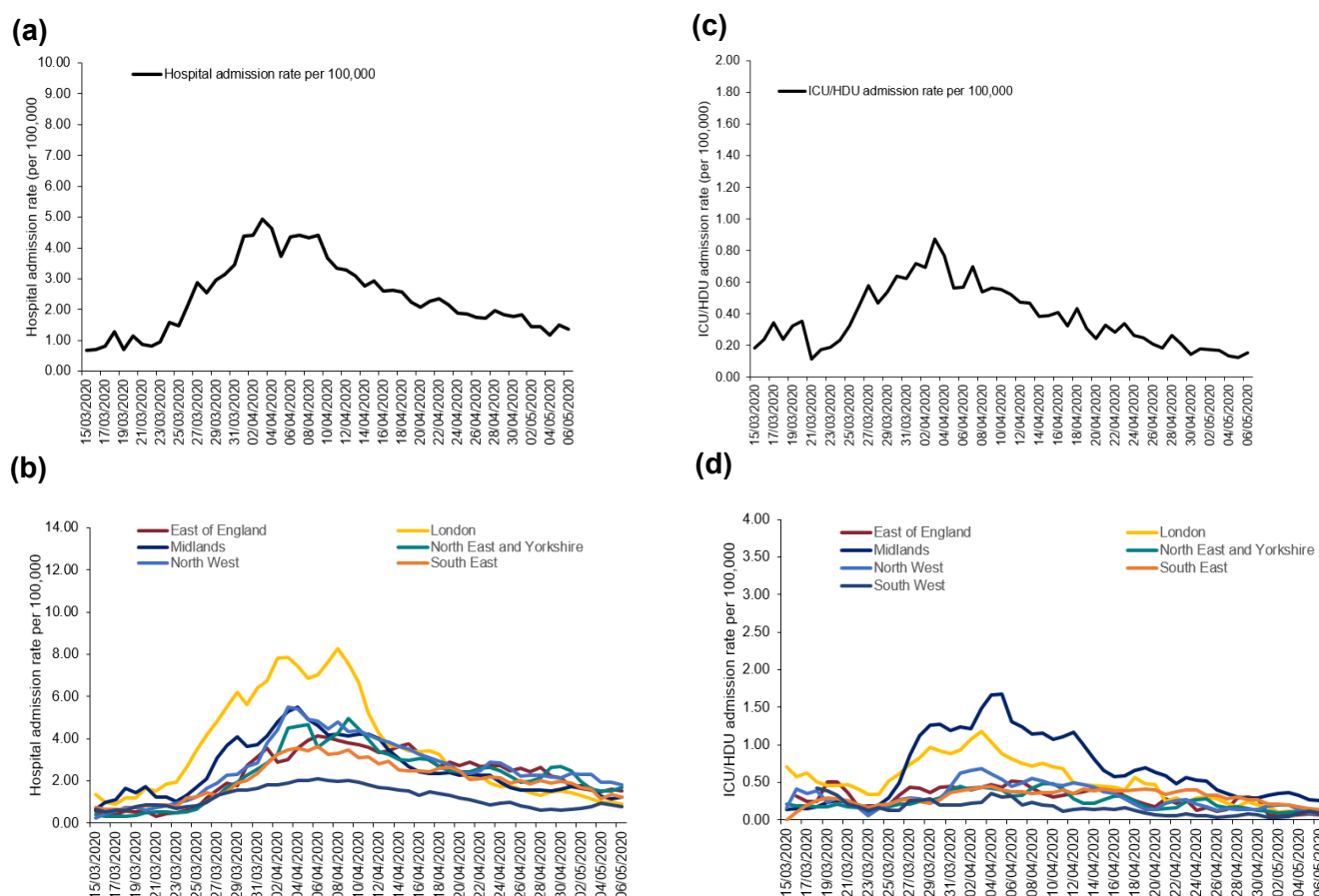
COVID-19 Hospitalisation in England Surveillance System (CHESS)

The CHESS surveillance system was initiated across all NHS Trusts in England on 15 March 2020. Since 02 March 2020, all patients in ICU/HDU with influenza-like illness (ILI) and/or lower respiratory tract infections (LRTI) and/or pneumonia have been tested for SARS-CoV-2. Since 15 March 2020, this was extended for all patients hospitalised with ILI, LRTI or pneumonia to be tested for SARS-CoV-2.

Figure 15 represents the daily admission rate and number of laboratory confirmed COVID-19 cases observed through CHESS since its commencement, up to 29 April 2020.

A total of 134 NHS Trusts are now participating. Through the CHESS surveillance system, 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.

Figure 15: Daily hospital admission rate (a) overall and (b) by NHS regions (3 day moving average rate) and ICU/HDU admission rate, (c) overall and (d) by NHS Regions rate (3 day moving average rate) of new COVID-19 positive cases reported through CHESS

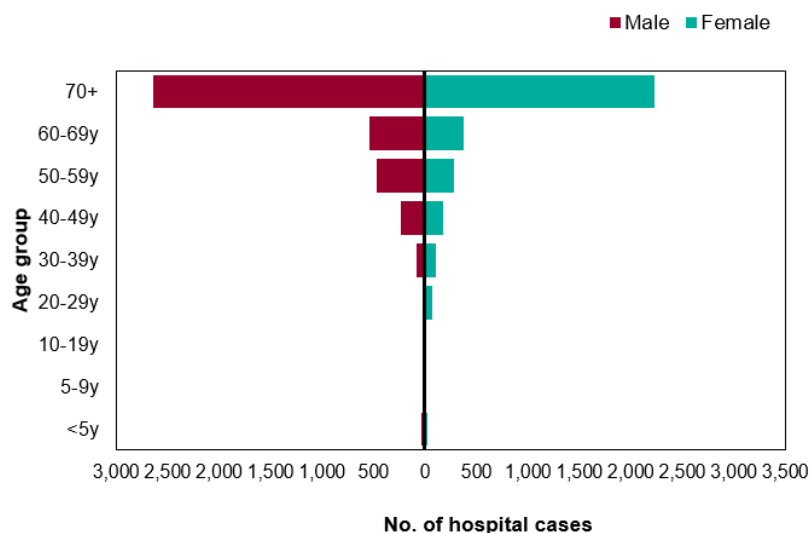


COVID-19 Hospitalisation in England Surveillance System (CHESS)

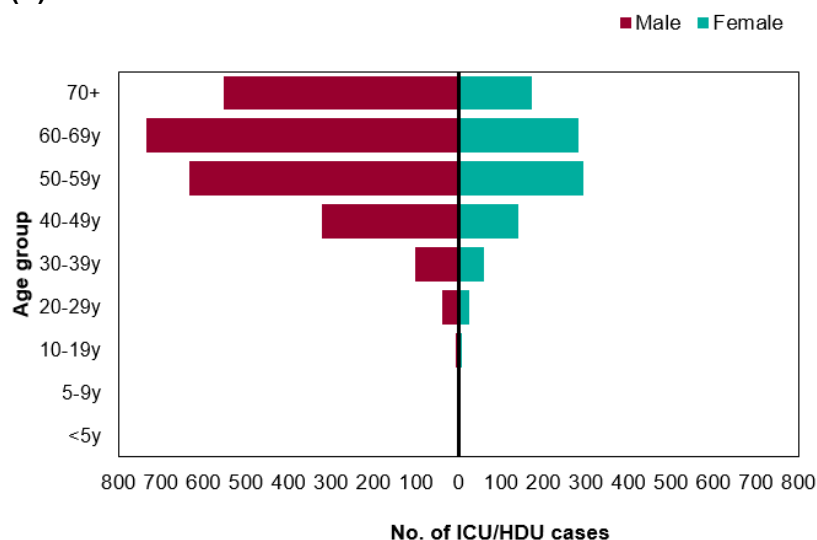
Figure 16 and 17 are based on individual patient level data which are provided to CHESS from a subset of NHS Acute Trusts, therefore the data should be interpreted with caution as the distribution of age, sex and ethnic group may not be representative of all hospitalised patients.

Figure 16: Age/sex pyramid of new (a) hospital (lower level of care) (n=7,306) and (b) ICU/ HDU (n=3,375) COVID-19 cases reported through CHESS, England

(a)

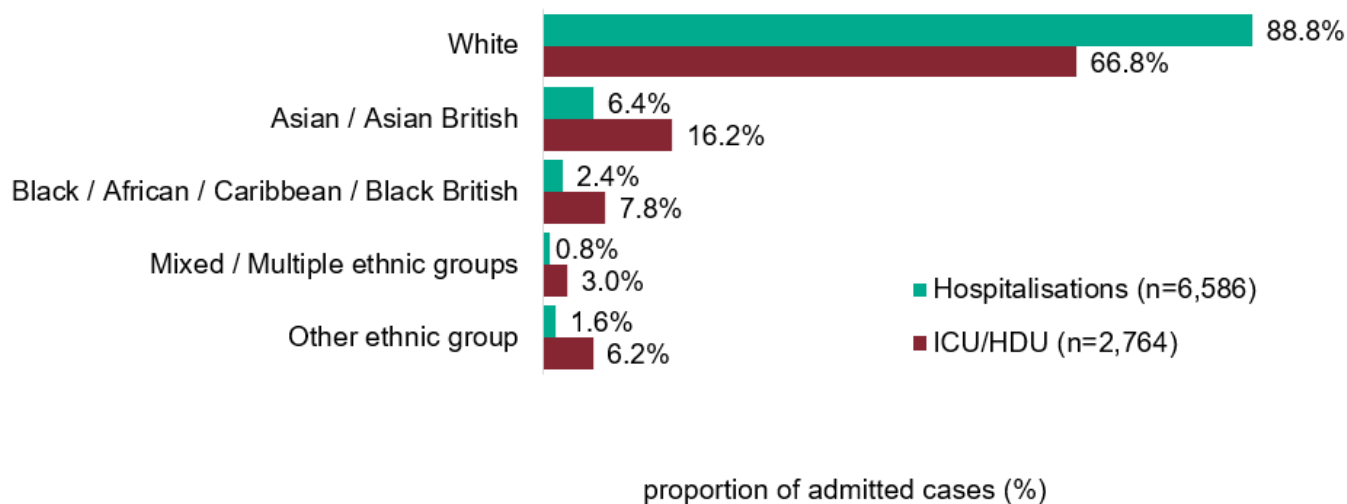


(b)



COVID-19 Hospitalisation in England Surveillance System (CHESS)

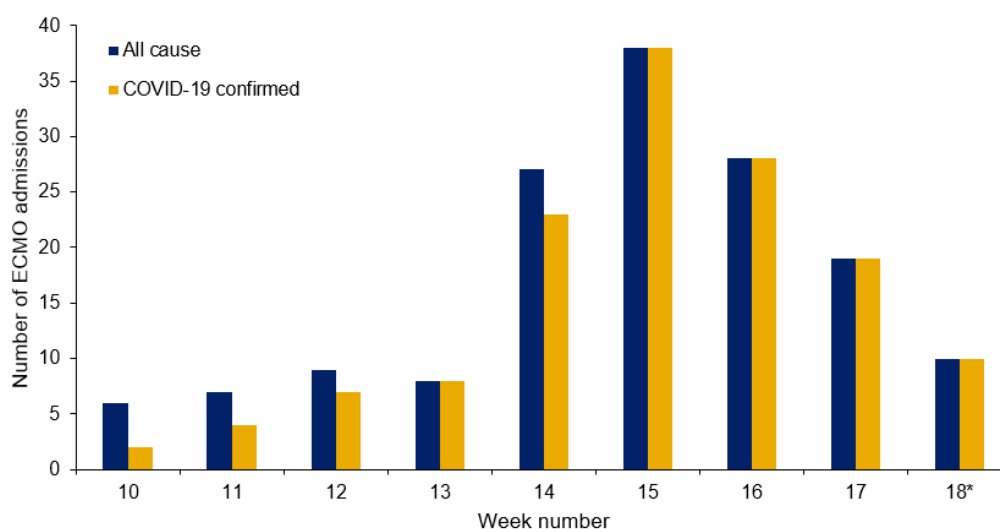
Figure 17: Ethnic group of new hospitalisations (lower level of care) (n=6,586) and ICU/HDU (n=2,764) COVID-19 cases reported through CHESS, England



UK Severe Respiratory Failure (SRF) centres admissions

Up to 06 May 2020, a total of 139 laboratory confirmed COVID-19 admissions have been reported from the 5 SRFs in England (Figure 18).

Figure 18: All cause and COVID-19 laboratory confirmed admissions to SRFs, UK

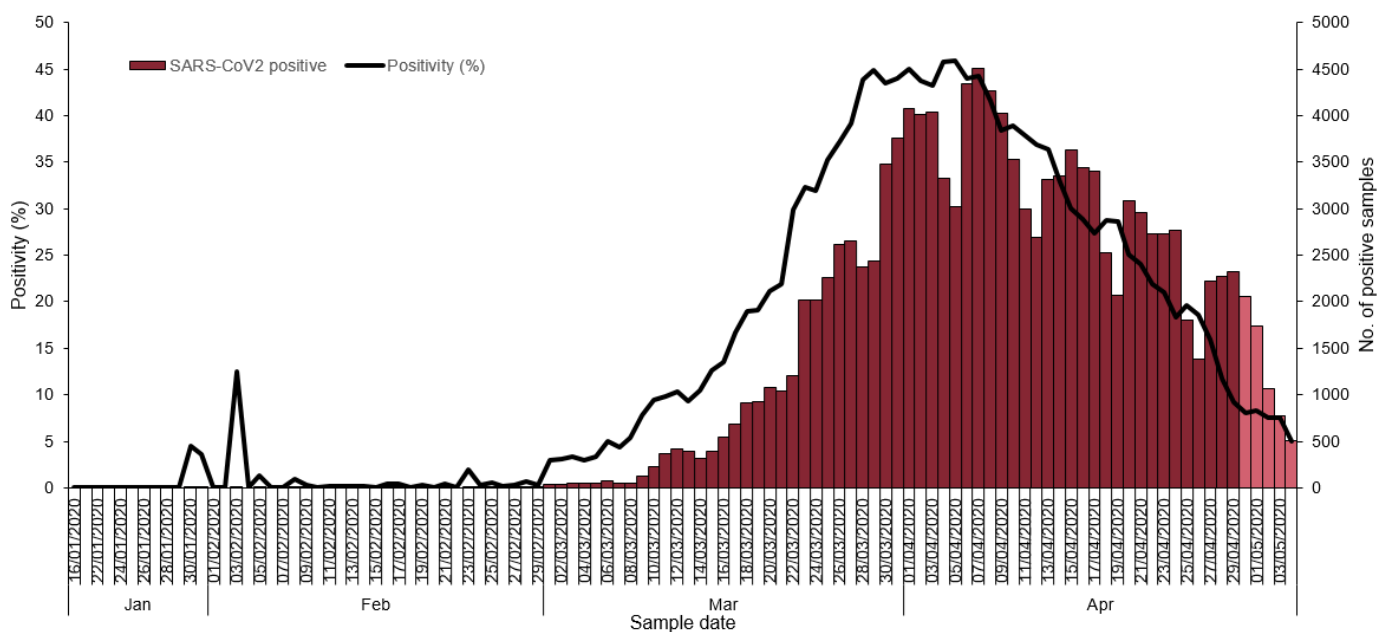


Second Generation Surveillance System (SGSS) and Respiratory Datamart positivity, England

The SGSS is the national laboratory reporting system used in England to capture routine laboratory data on mainly infectious diseases and antimicrobial resistance. The Respiratory Datamart has been used to monitor major respiratory viruses circulating in England bringing together this data from PHE laboratories in England since 2009. Both SGSS and Respiratory Datamart have been adapted and combined to capture detections of SARS-CoV-2.

The overall daily positivity has decreased to 1.6% up to 05 April compared to 11.7% on the same day in the previous week (Figure 19). In week 18, the highest positivity was observed in the 45-64 and 65+ year olds (Figure 20(a)). The highest positivity was in the North East PHE centre (Figure 20(b)).

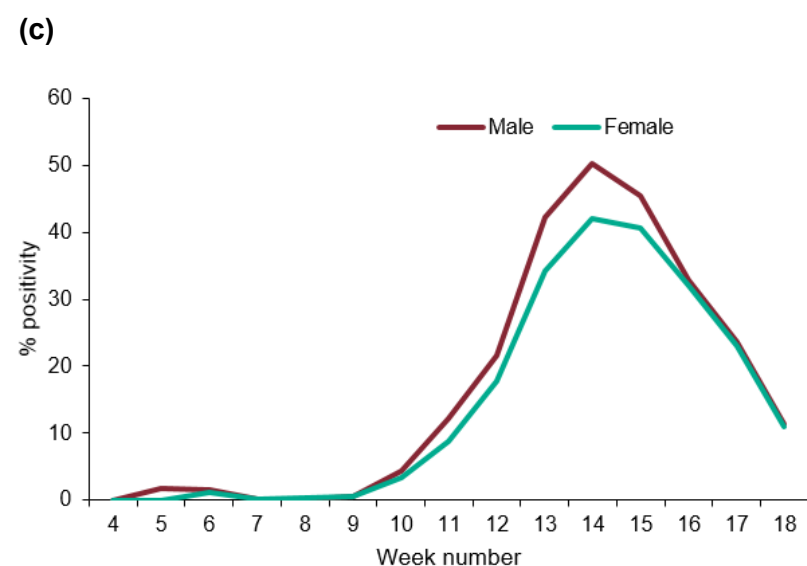
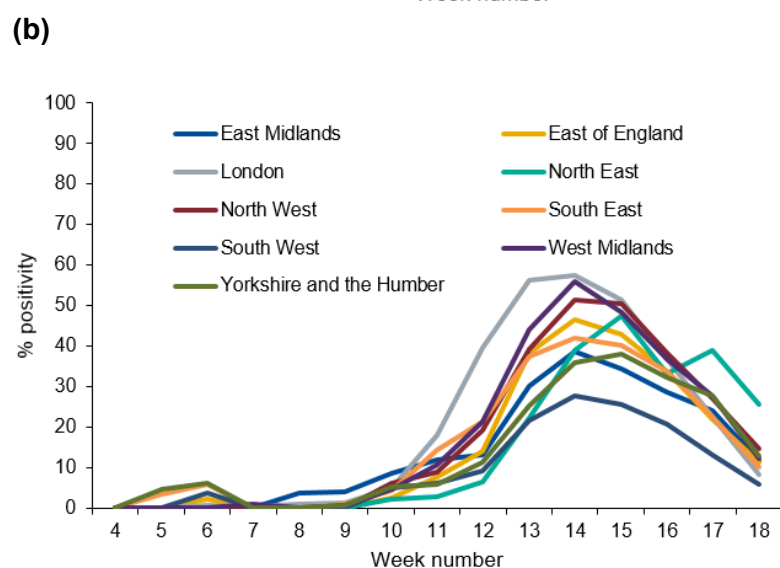
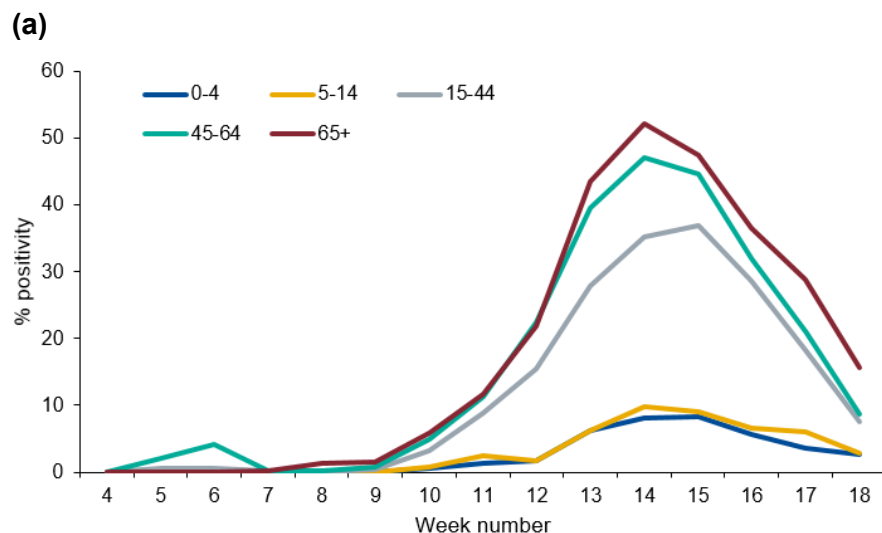
Figure 19: Overall positivity (%) (daily) and number of SARS-CoV-2 positive samples (n=129,661), England (SGSS and Respiratory DataMart)



* For the most recent dates (in light red), more samples are expected therefore the decrease seen in this graph should be interpreted with caution

Second Generation Surveillance System (SGSS) and Respiratory Datamart positivity, England

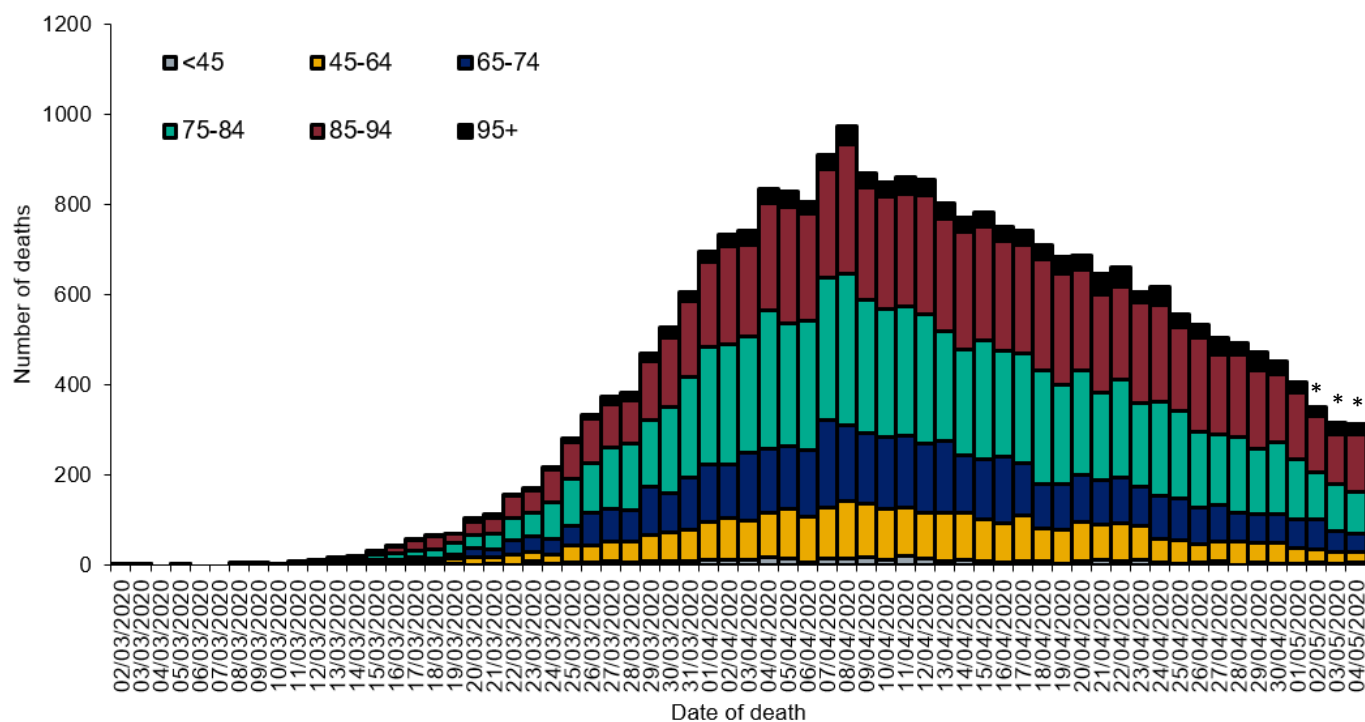
Figure 20: Positivity (%) (weekly) by (a) age group (n=128,355) and (b) PHE centre (n=128,344) (c) gender (n/N=126,591/483,535), England (DataMart)



Cumulative deaths

As of 5pm on 05 May 2020, a total of 27,008 cases with confirmed COVID-19 have died in England.

Figure 21: Cumulative number of deaths by date of death and age group, England (n=27,008)



* For the most recent dates, more deaths will be reported therefore the decrease seen in this graph should be interpreted with caution

Cumulative deaths

Figure 22: Age/sex pyramid of laboratory confirmed COVID-19 deaths (n=27,008)

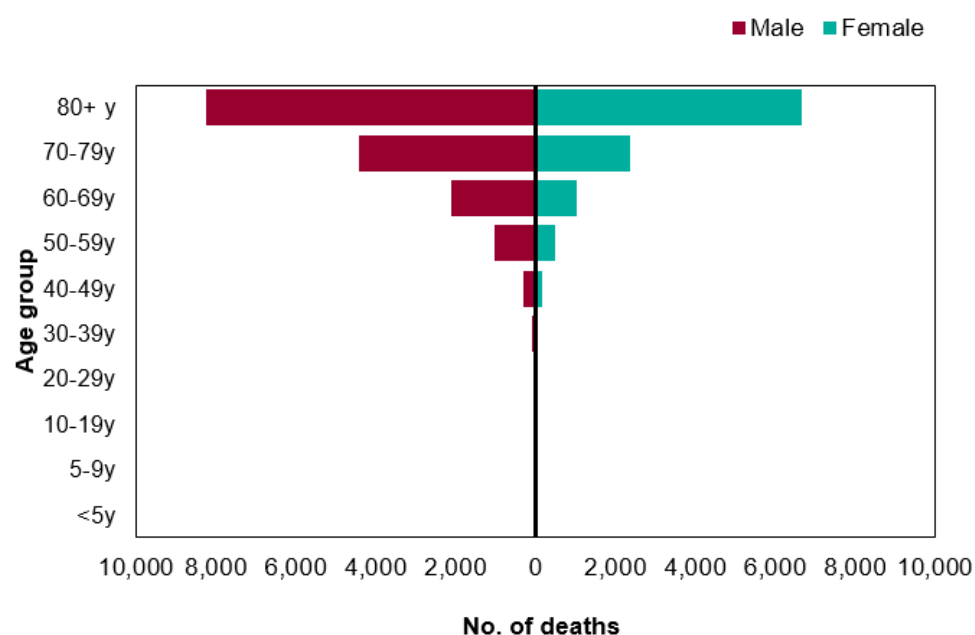
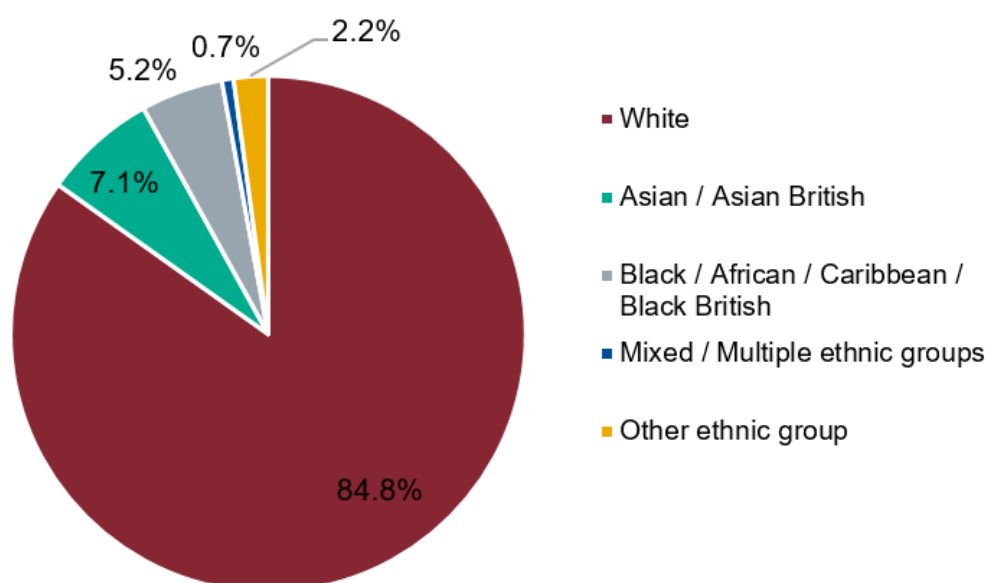


Figure 23: Ethnic group of confirmed COVID-19 deaths, England (n= 26,021)



Excess all-cause mortality, UK

In week 18 2020 in England, statistically significant excess mortality by week of death above the upper 10 z-score threshold was seen overall, by age group in the 15-64 and 65+ year olds and sub nationally (all ages) in all regions (North East, North West, Yorkshire & Humber, East & West Midlands, East of England, London and South East & West regions) after correcting GRO disaggregate data for reporting delay with the standardised EuroMOMO algorithm (Figure 24). This data is provisional due to the time delay in registration; numbers may vary from week to week.

Figure 24: Weekly observed and expected number of all-cause deaths in all ages, with the dominant circulating influenza type(s), England, 2015 to week 18 2020

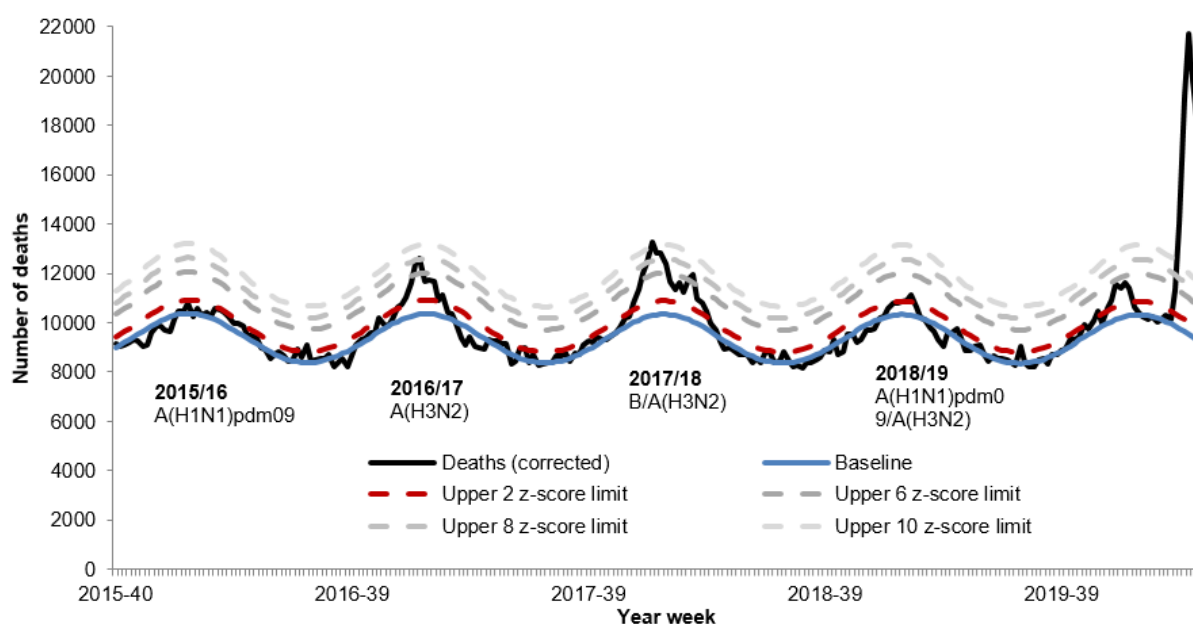


Table 2: Excess mortality by UK country, all ages*

Country	Excess detected in week 18 2020?	Weeks with excess in 2019/20
England	✓	44; 47; 49-02; 12-18
Wales	✓	51; 01; 13-18
Northern Ireland	x	50-51; 03; 14-17
Country	Excess detected in week 16 2020?	Weeks with excess in 2019/20
Scotland	✓	41; 46; 49-51; 01-02; 13-16

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

Global situation

Globally, up to 06 May 2020, a total of 3,599,241 laboratory-confirmed cases of COVID-19 infection have been reported worldwide, including 254,756 COVID-19 related deaths.

Figure 25: Global map of COVID-19 cases by classification

