Public Health England

Weekly Coronavirus Disease 2019 (COVID-19) Surveillance Report

Summary of COVID-19 surveillance systems

Year: 2020 Week: 18

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 17 (data between 20 April and 26 April 2020) and where available daily data up to 29 April 2020.

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

As of 09:00 on 29 April 2020, there have been a total of 115, 859 laboratory confirmed cases of COVID-19 in England.

Community surveillance:	• a total of 1,006 acute respiratory outbreaks have been reported in week 17, of which 472 (458 in care homes, 6 in hospitals, 2 in schools and 6 in other settings) were confirmed SARS-CoV-2 outbreaks
Primary care surveillance:	• the overall RCGP swabbing positivity for week 16 was 17.6% compared to 30.0% in the previous week • through the syndromic surveillance systems, GP in Hours consultations for potential COVID-19 decreased • 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:	• the hospital admission rate through CHESS was at 1.89 per 100,000 (29 April 2020) compared to 2.36 per 100,000 for the same day (22 April 2020) in the previous week • the ICU/HDU admission rate through CHESS was at 0.21 per 100,000 (29 April 2020) compared to 0.28 per 100,000 (22 April 2020) for the same day in the previous week • a total of 121 laboratory confirmed COVID-19 admissions have been reported from the 5 Severe Respiratory Failure (SFR) Centres in England
Virological surveillance:	• the overall % positivity through Respiratory DataMart was 13.7% in week 18 (based on daily data up to 28 April 2020) compared to 17.5% for the same day (21 April 2020) in the previous week
Mortality surveillance:	• statistically significant excess all cause mortality was observed in week 17 in England by age in the 15 to 64 and 65+ year olds and subnationally (all ages) in all regions

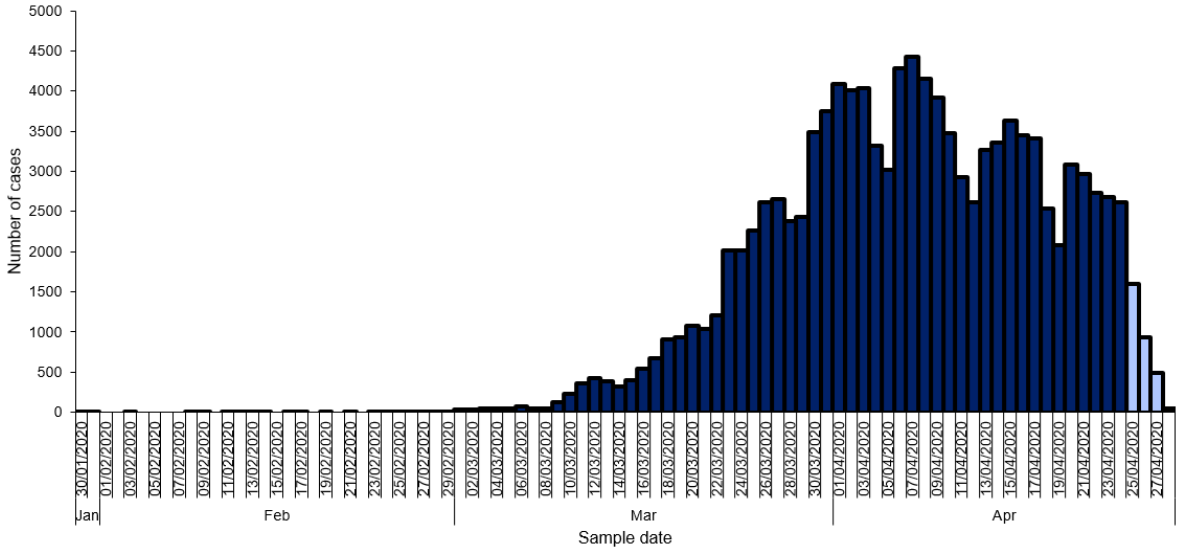
SARS-CoV-2 testing started in UK laboratories on 24 January 2020. This data is reported through a combination of laboratory systems (SGSS and Respiratory DataMart). The majority of testing to date has been offered to those in hospital with a medical need as well as NHS key workers, rather than the general 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 29 April 2020, a total of 403,404 people have been tested, of which 115,859 have been confirmed positive for COVID-19 in England.

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=115,859)



* 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=114,113)

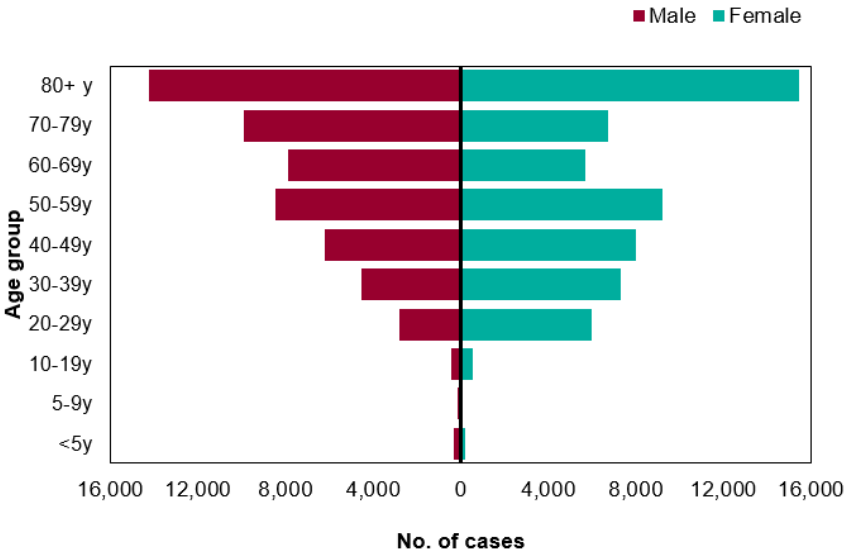


Figure 3: Ethnic group of laboratory confirmed COVID-19 cases (n= 78,906)

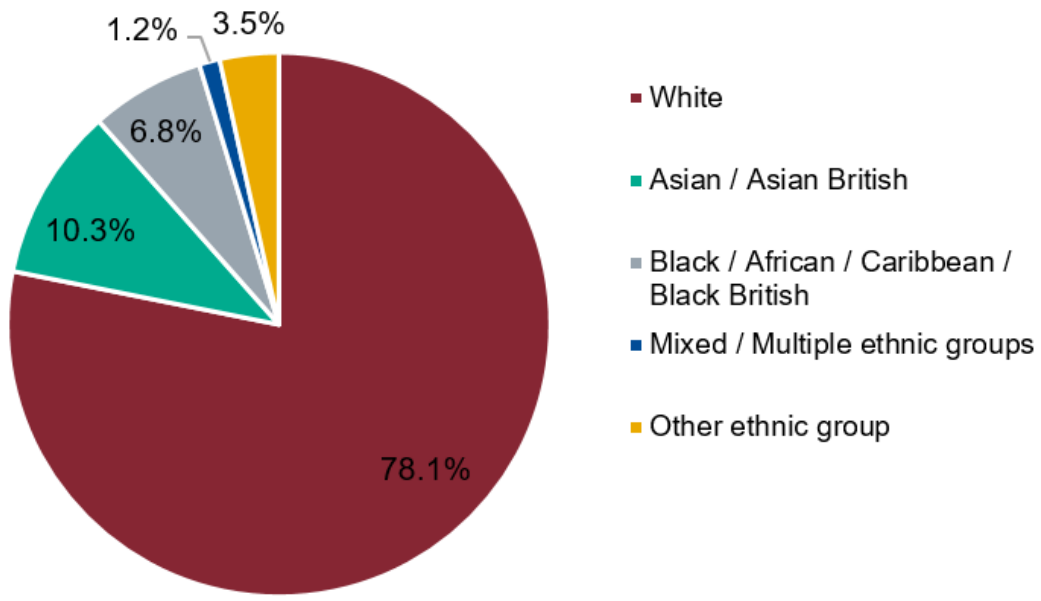
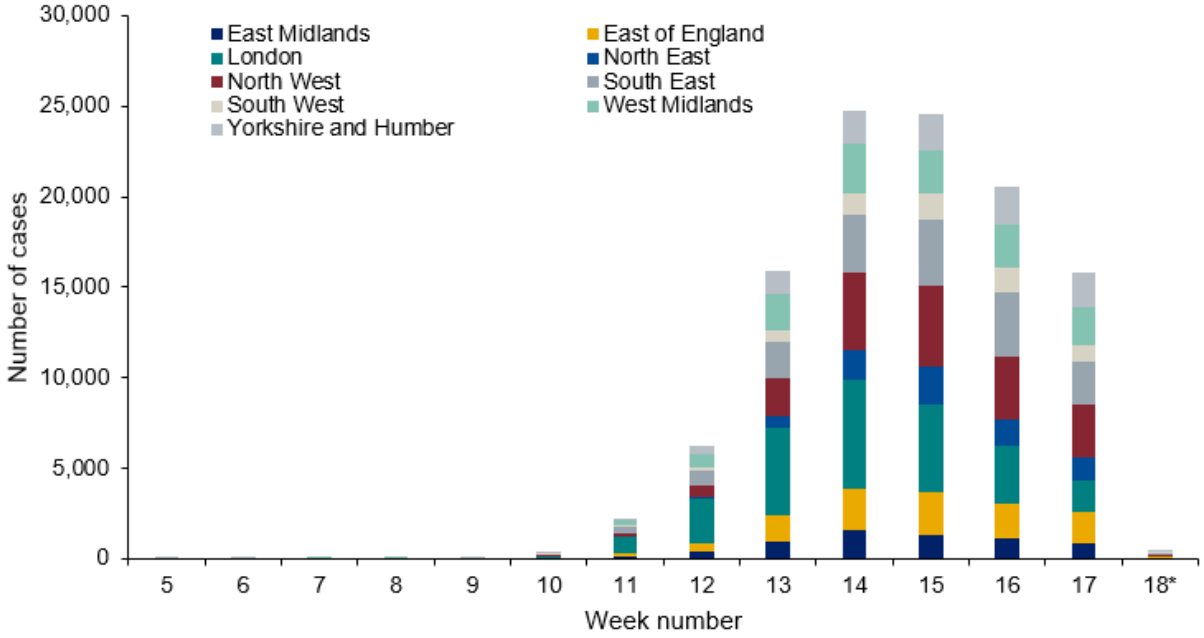


Table 1: Cumulative total number of cases by PHE Centres (n=110,858)

PHE Centres	Cases
North East	7,224
North West	18,106
Yorkshire & Humber	9,665
West Midlands	12,593
East Midlands	6,530
East of England	10,478
London	24,090
South East	16,116
South West	6,056

Figure 4: Laboratory confirmed COVID-19 cases, by PHE Centres and sample date week (n= 110,858)



* Data from week 18 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.

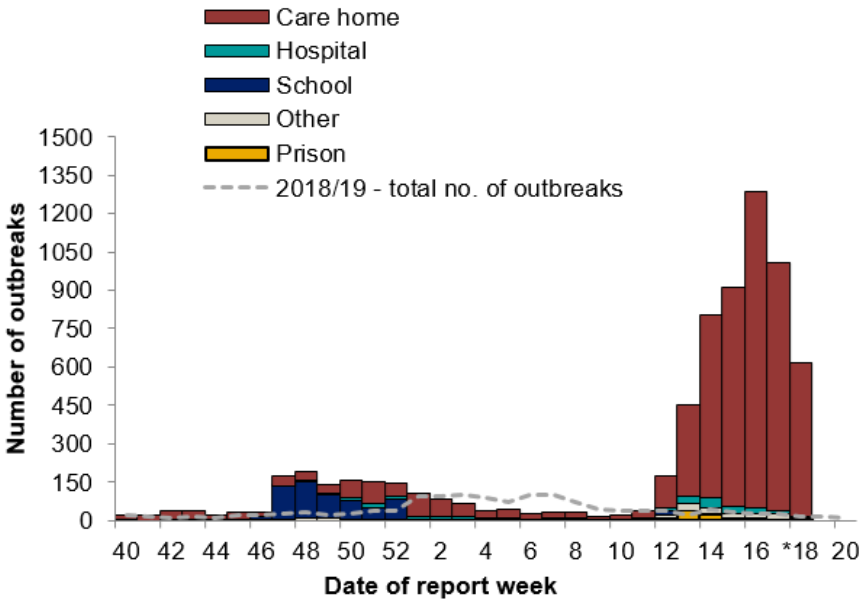
Acute respiratory outbreaks, UK

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

1,006 new acute respiratory outbreaks have been reported in week 17 (Figure 5):

- 971 outbreaks were from care homes where 458 tested positive for SARS-CoV-2
- 7 outbreaks were from hospitals where 6 tested positive for SARS-CoV-2 and one tested positive for influenza A
- 2 outbreaks were in schools where both tested positive for SARS-CoV-2
- 4 outbreaks were from prisons with no test results available
- 22 outbreaks were from the Other Settings category where 6 tested positive for SARS-CoV-2

Figure 5: Number of acute respiratory outbreaks by institution, UK



* Data from week 18 refer to outbreaks reported from Monday to Wednesday only therefore this graph should be interpreted with caution as more outbreaks will be reported in future for this week.

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.

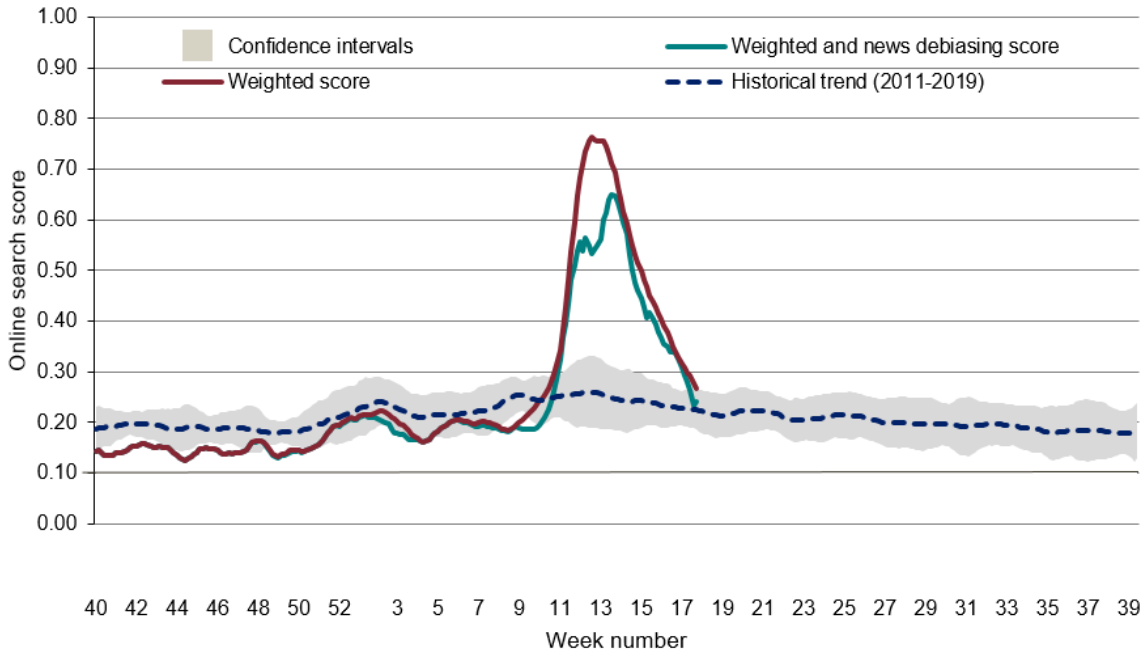
Google search queries

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 de-biasing weighted scores continued to decrease in week 17 (up to 25 April) (Figure 6).

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

Figure 6: Normalised Google search score for COVID-19 symptoms, with weighted score for media-de-biasing and historical trend, England



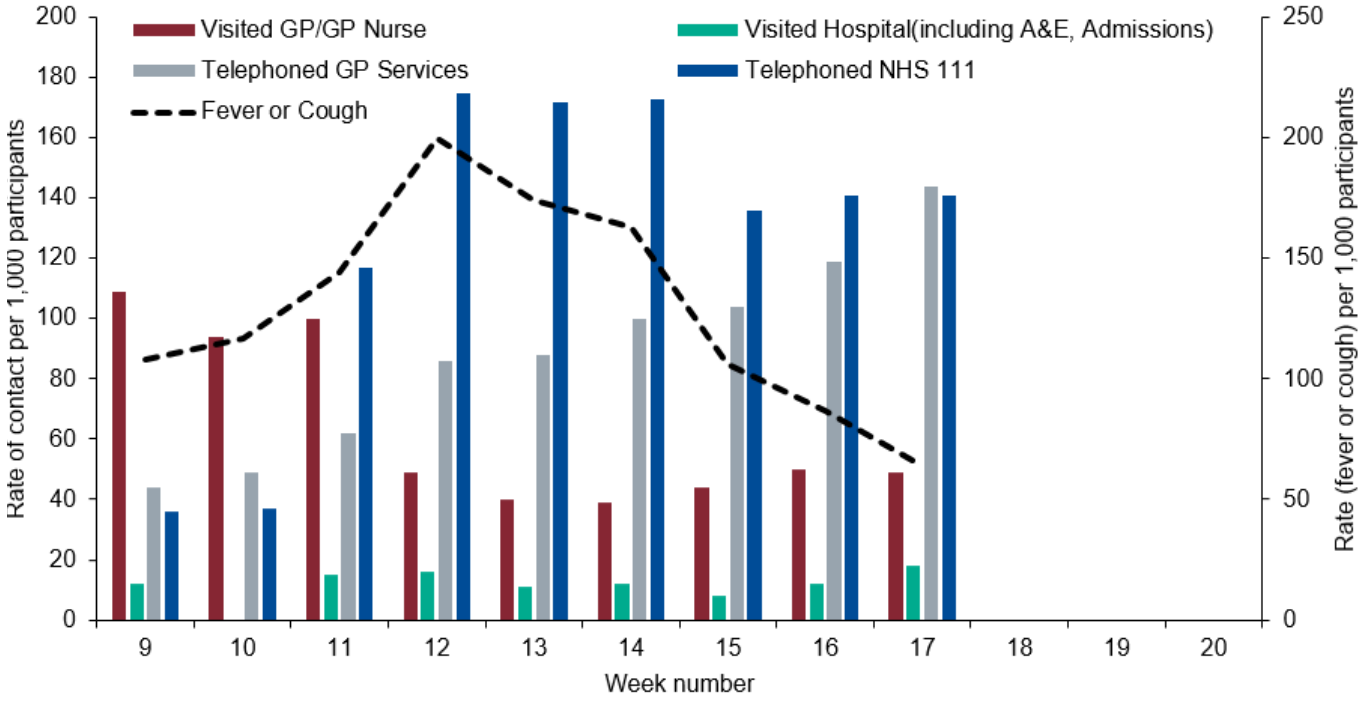
Internet based surveillance

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 4,425 participants completed the weekly COVID-19 surveillance survey in week 17. 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 7), which is in line with current government recommendations.

Figure 7: Rate of contact with different healthcare services among FluSurvey participants reporting fever or cough symptoms, week 09 to 17, England



GP In Hours (GPIH), Syndromic surveillance

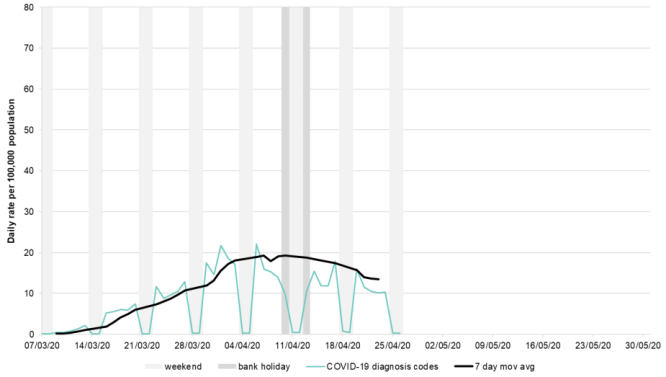
The GP In Hours (GPIH) syndromic surveillance system monitors the number of GP visits during regular hours of known clinical indicators. This system covers around 55% of England's population.

Figure 8 (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.

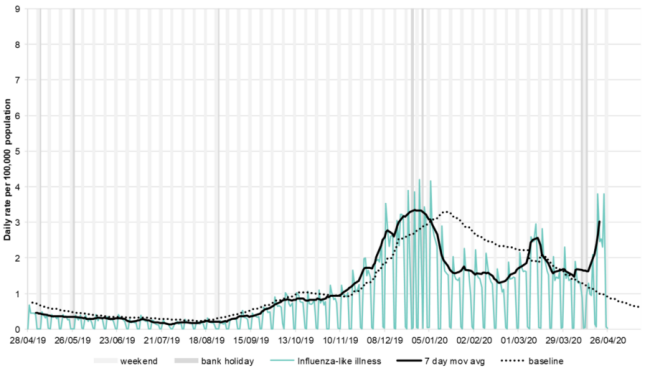
Up to 26 April 2020, potential COVID-19 GP consultations decreased as did pneumonia and LRTI consultations (Figure 8). This data should be interpreted with caution due to changes in advice regarding accessing GP surgeries due to COVID-19 and changes in coding of suspected COVID-19 cases. A new COVID-19 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 8(b)).

Figure 7 (a-d): GPIH clinical indicators, England

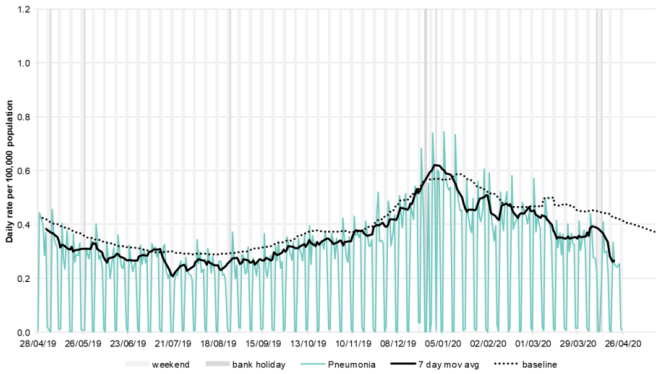
(a) Potential COVID-19 GP consultations, daily incidence rates per 100,000 population, all ages, England



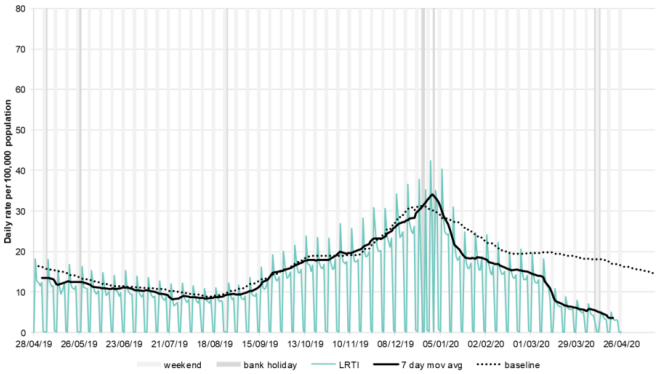
(b) Influenza-like illness, daily incidence rates per 100,000 population, all ages, England



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



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



GP Out of Hours (GPOOH), Syndromic surveillance

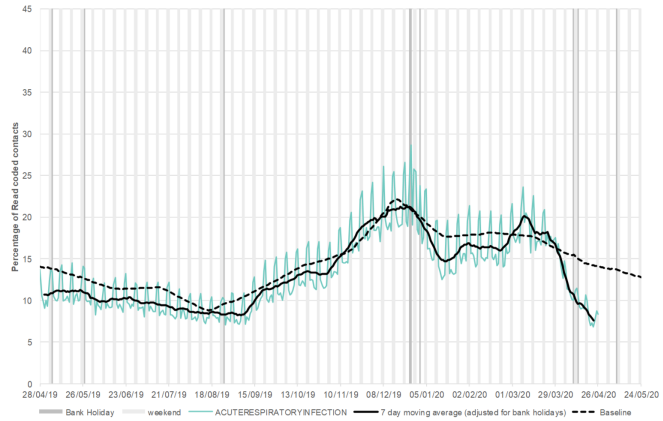
The GP Out of Hours (GPOOH) syndromic surveillance system monitors the numbers of daily unscheduled visits and calls to GPs during evenings, overnight, on weekends and on public holidays. This system covers approximately 70% of England's out of hours activity and complements the existing GP surveillance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

Figure 9 (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.

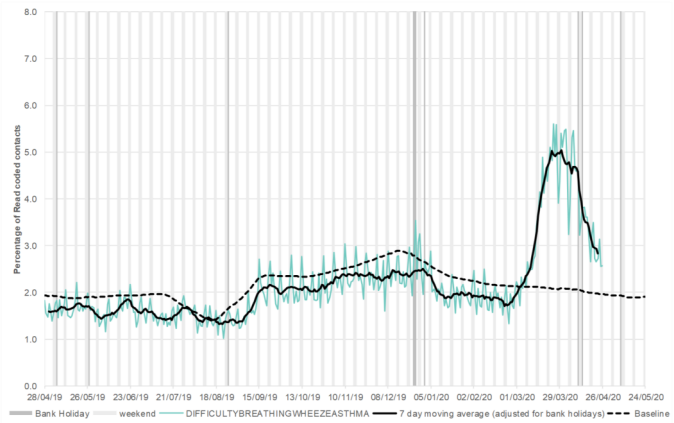
Up to 26 April 2020, the daily percentages for ARI, difficulty breathing/wheeze/asthma and ILI all decreased (Figure 9).

Figure 9 (a-c): GPOOH indicators, England

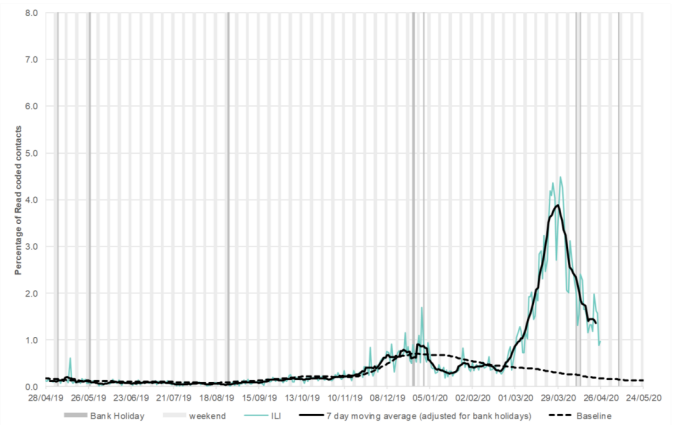
(a) Acute Respiratory Infection, daily contacts, all ages, England



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



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

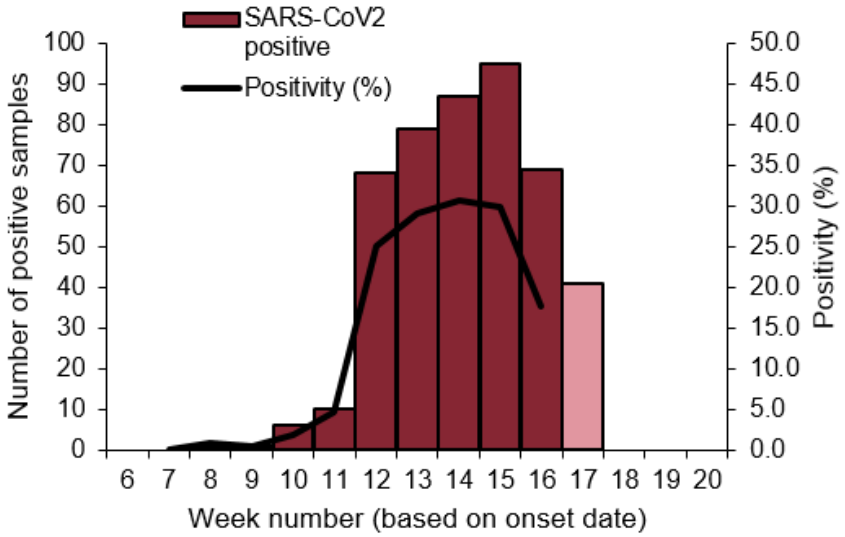


RCGP Swabbing Scheme

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 29 April 2020, a total of 2,623 patients have been tested of which 458 have tested positive for SARS-CoV-2 through this scheme. The overall positivity for week 16 was 17.6% compared to 30.0% in the previous week (Figure 10). The highest positivity by PHE region was noted in the Central region (Figure 11). The highest positivity by age group was observed in the 65+ year olds and 45-64 year olds and by gender in females (Figure 12).

Figure 10: Overall positivity (%) (weekly) and number of SARS-CoV-2 positive samples, England (RCGP)



For week 17 (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 11: Overall positivity (%) (weekly) by PHE Region, England (RCGP)

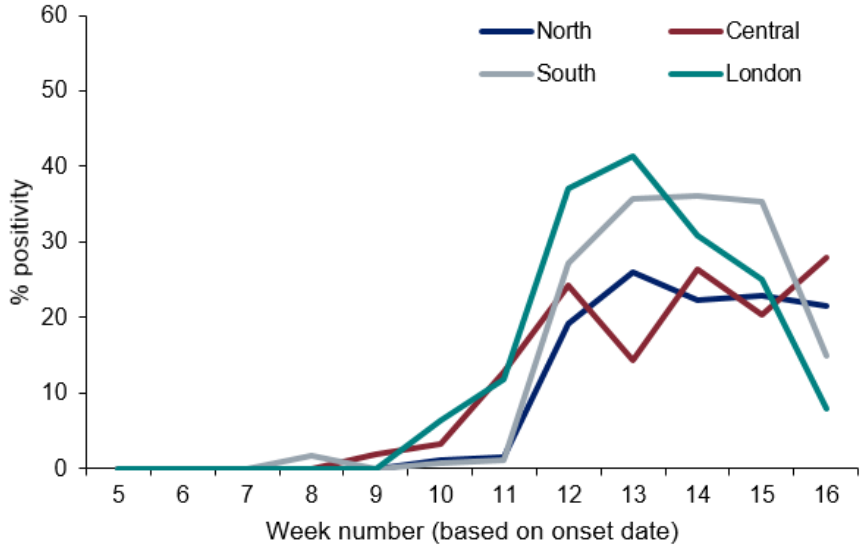
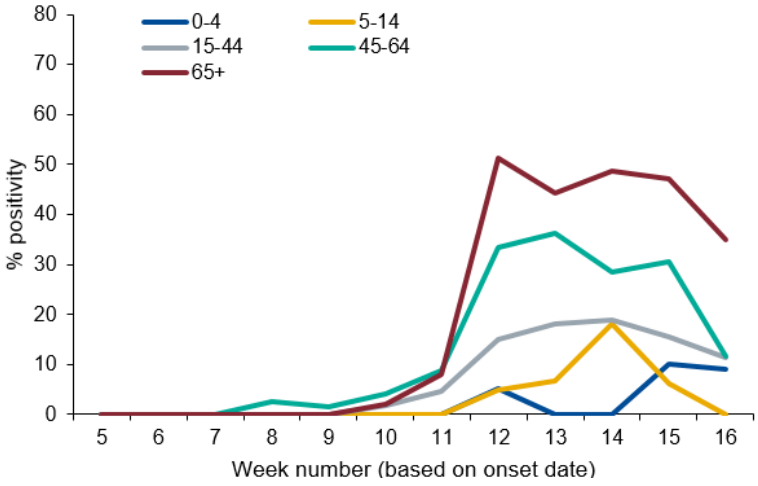
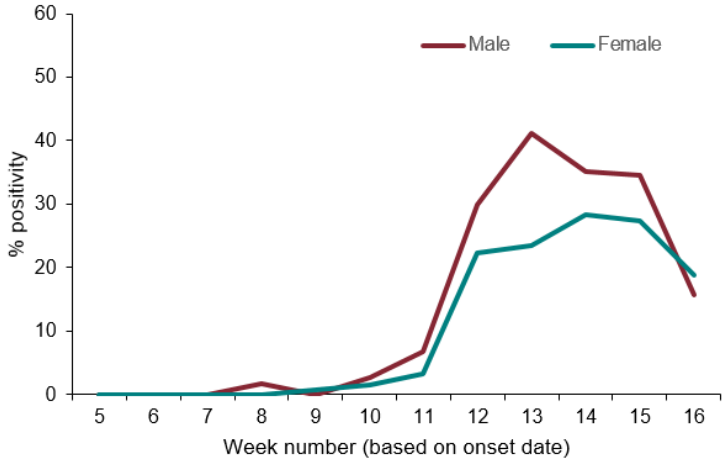


Figure 12: Positivity (%) (weekly) by (a) age group and (b) gender, England (RCGP)

(a)



(b)



Emergency Department attendances, Syndromic surveillance

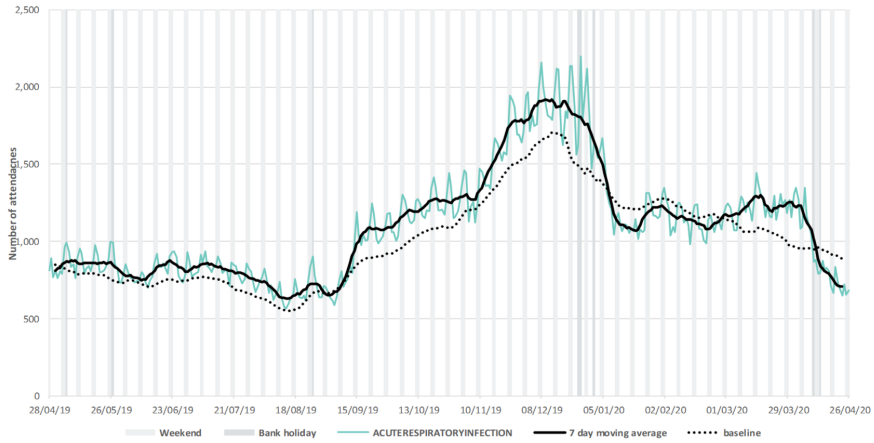
The Emergency Department Syndromic Surveillance System (EDSSS) monitors the daily visits in a network of emergency departments across England.

Figure 13 (a-b) represents the daily number of ED attendances for all ages as reported by up to 60 EDs in England during week 16 for (a) acute respiratory infection (ARI) and (b) pneumonia with a 7-day moving average for each respectively.

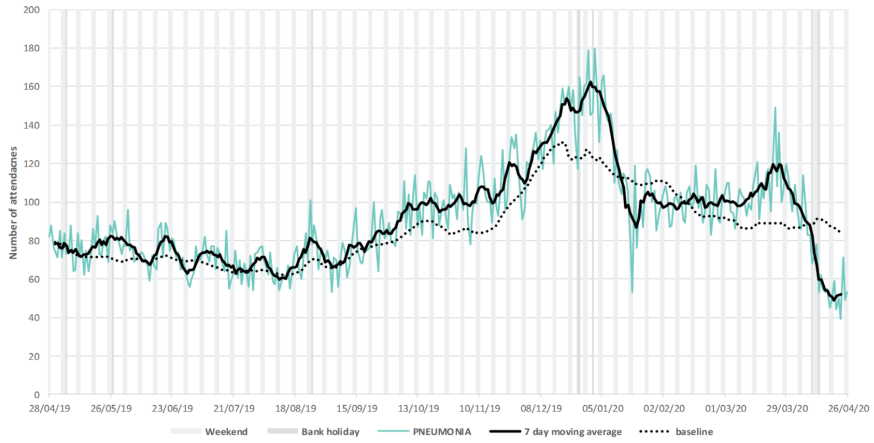
Up to 26 April 2020, the daily number of ARI attendances decreased, although pneumonia attendances remained stable.

Figure 13 (a-b): EDSSS indicators, England

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



(b) Pneumonia, daily percentage, all ages, England



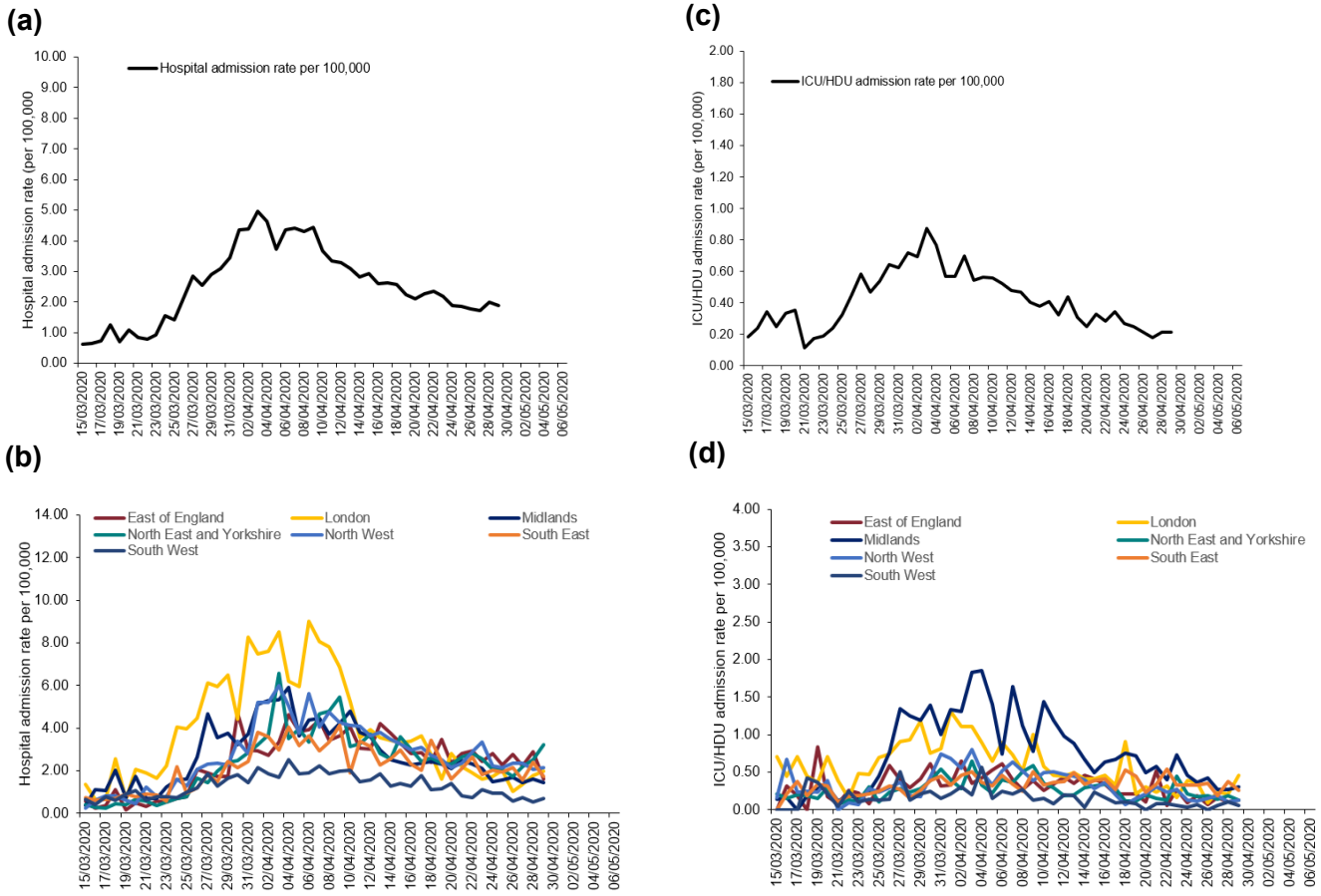
COVID-19 Hospitalisation in England Surveillance System (CHESS)

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 14 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 132 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 14: Daily hospital admission rate (a) overall and (b) by NHS regions and ICU/HDU admission rate, (c) overall and (d) by NHS Regions rate of new COVID-19 positive cases reported through CHESS

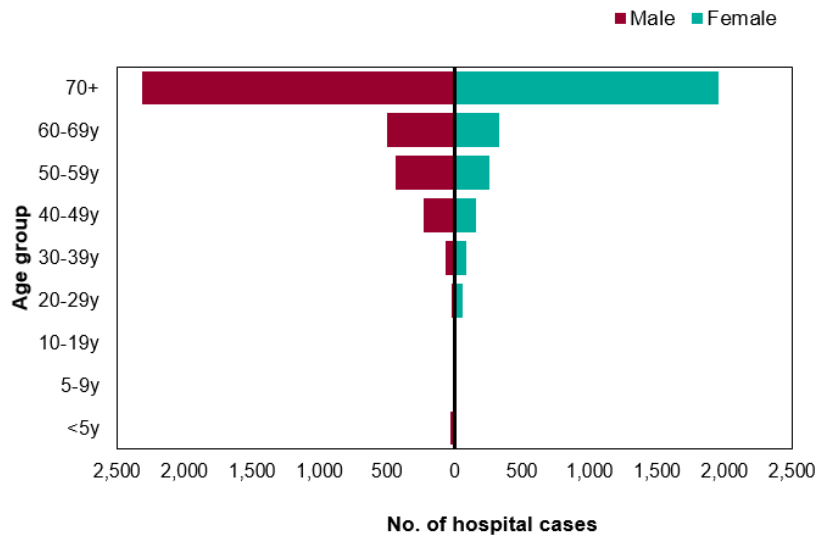


COVID-19 Hospitalisation in England Surveillance System (CHESS)

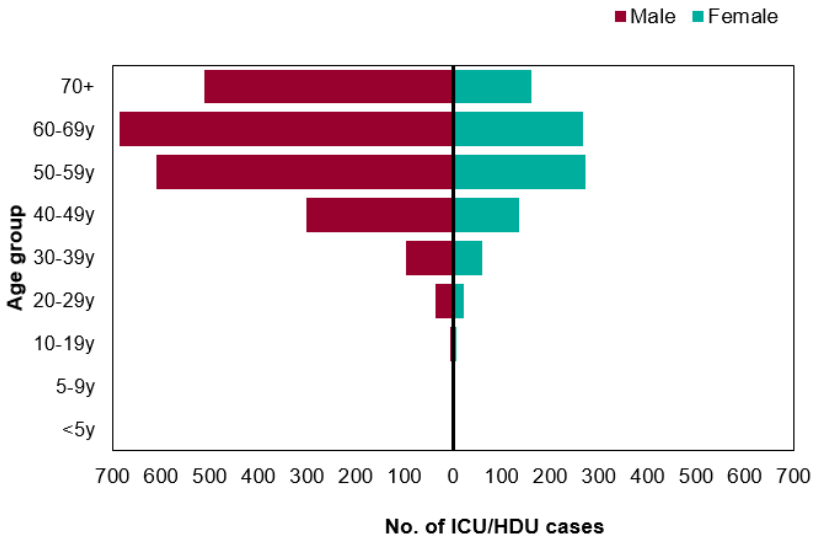
Figure 15 and 16 are based on individual patient level data which are provided to CHESS from a subset of NHS Acute Trusts, therefore the data should be interpreted with caution as the distribution of age, sex and ethnic group may not be representative of all hospitalised patients.

Figure 15: Age/sex pyramid of new (a) hospital (lower level of care) (n=6,487) and (b) ICU/ HDU (n=3,176) COVID-19 cases reported through CHESS, England

(a)

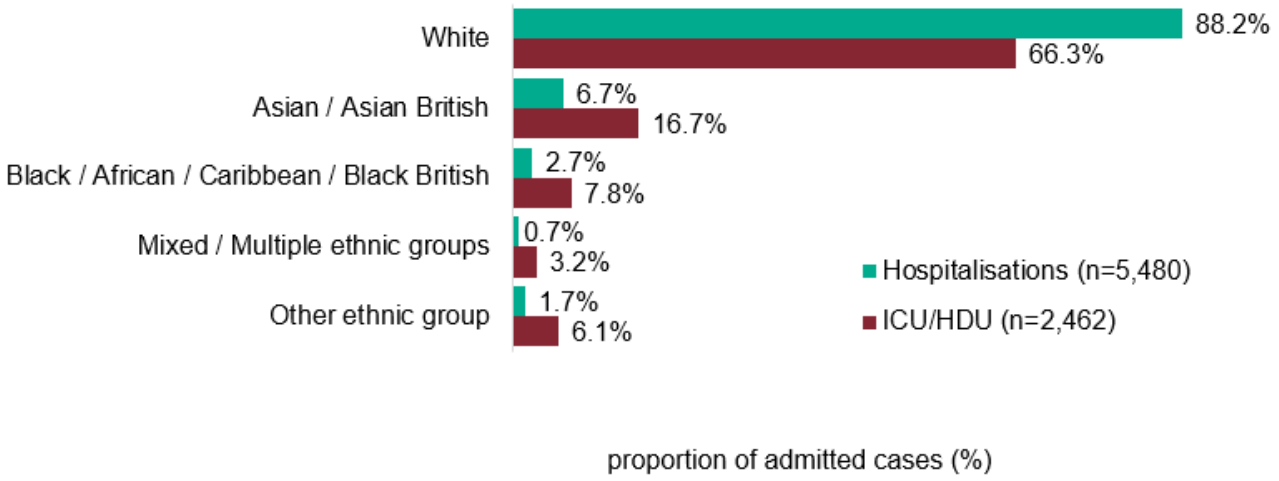


(b)



COVID-19 Hospitalisation in England Surveillance System (CHESS)

Figure 16: Ethnic group of new hospitalisations (lower level of care) (n=5,480) and ICU/ HDU (n=2,462) COVID-19 cases reported through CHESS, England



UK Severe Respiratory Failure (SRF) centres admissions

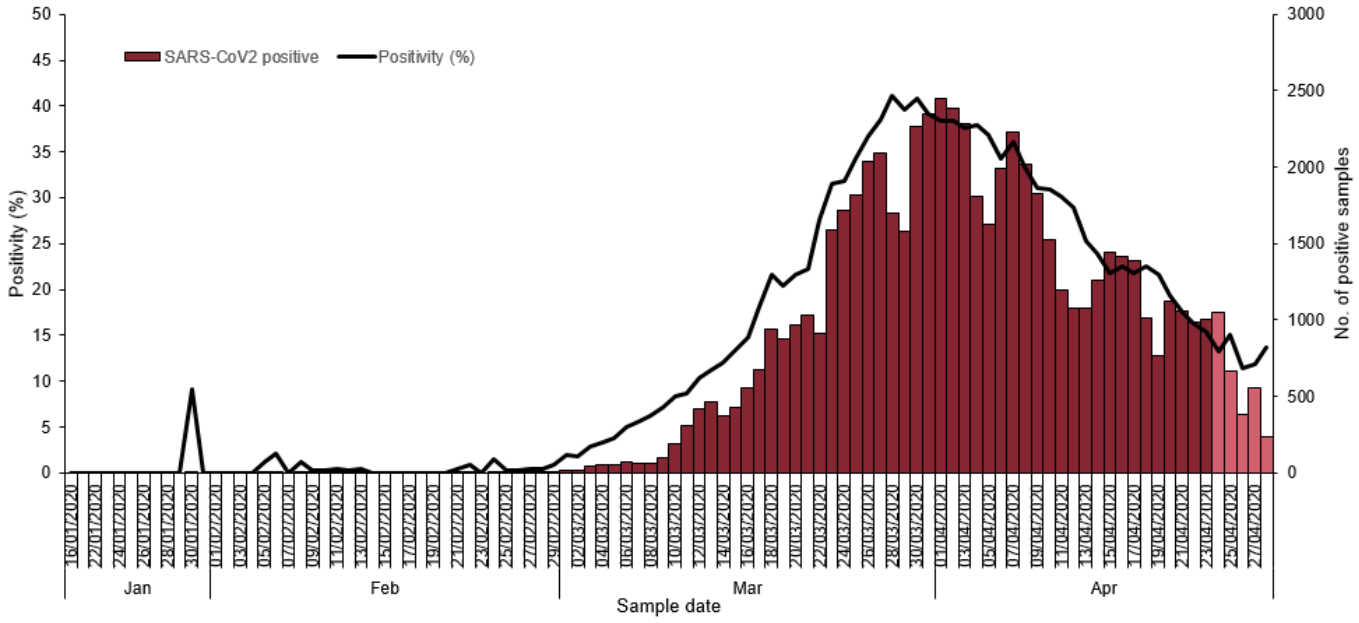
Up to 29 April 2020, a total of 121 laboratory confirmed COVID-19 admissions have been reported from the 5 SRFs in England.

Respiratory DataMart, England

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. This system has been adapted to capture detections of SARS-CoV-2.

The overall daily positivity has decreased to 13.7% up to 28 April compared to 17.5% on the same day in the previous week (Figure 17). In week 17, the highest positivity was observed in the 45-64 and 65+ year olds (Figure 18(a)). The highest positivity was in the Yorkshire and the Humber PHE centre (Figure 18(b)).

Figure 17: Overall positivity (%) (daily) and number of SARS-CoV-2 positive samples, England (DataMart)

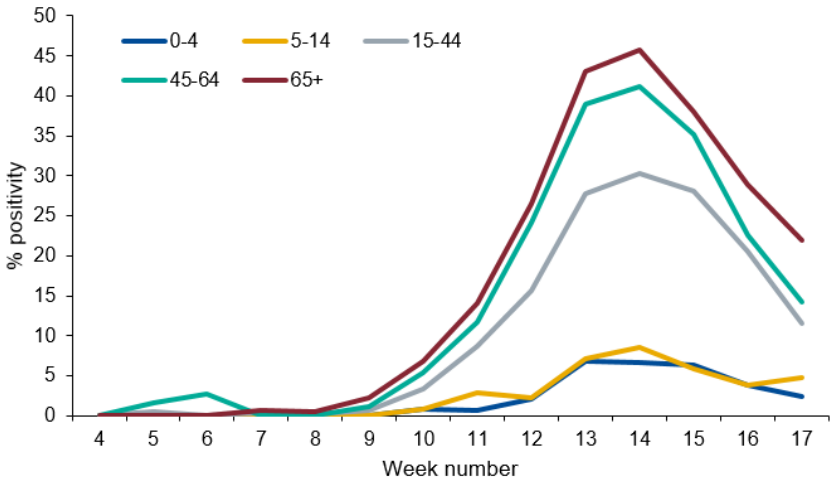


* For the most recent dates (in light red), more samples are expected therefore the decrease seen in this graph should be interpreted with caution

Respiratory DataMart, England

Figure 18: Positivity (%) (weekly) by (a) age group and (b) PHE centre (c) gender, England (DataMart)

(a)



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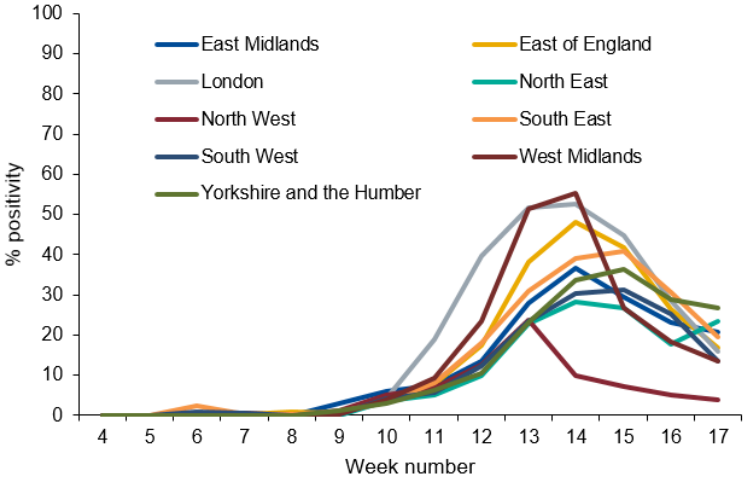

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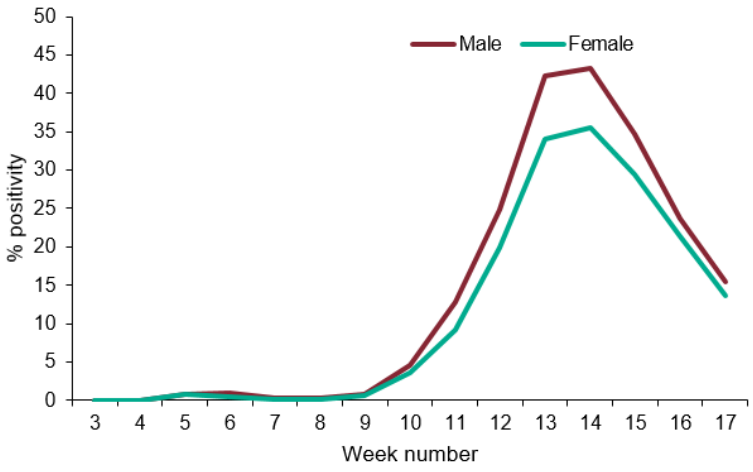
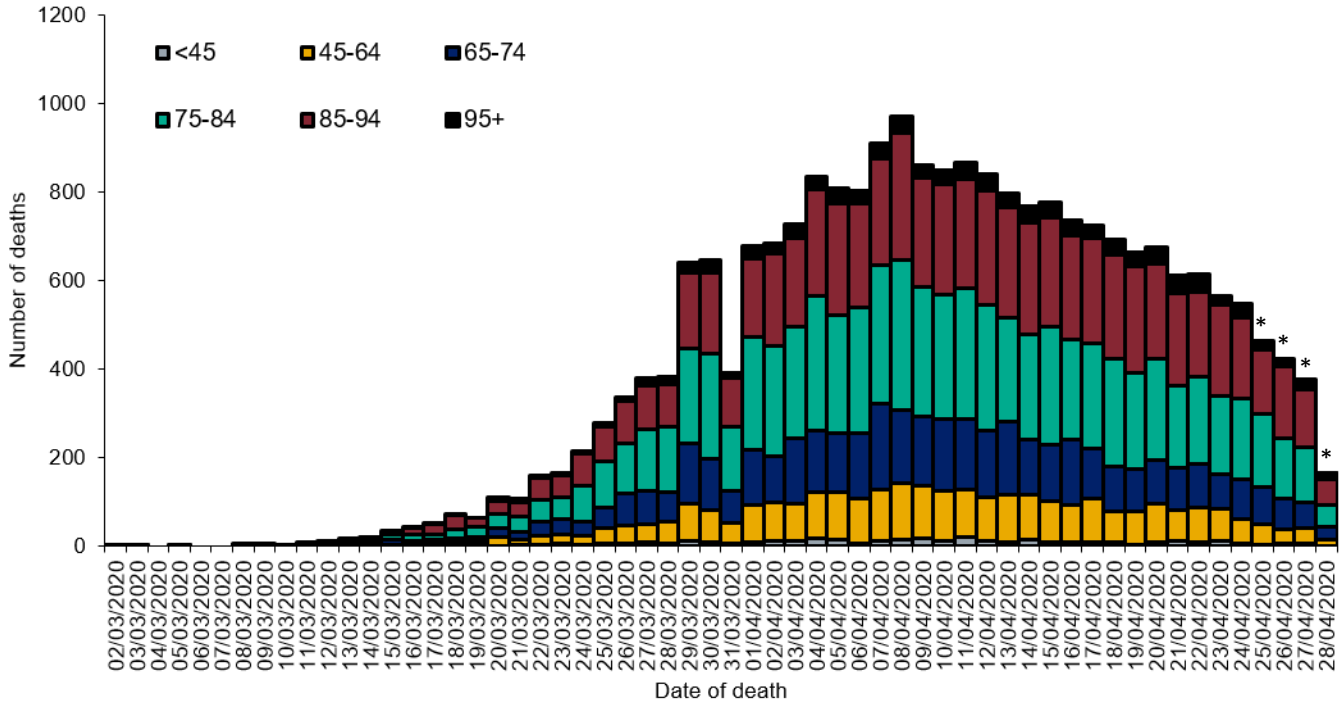


Cumulative deaths

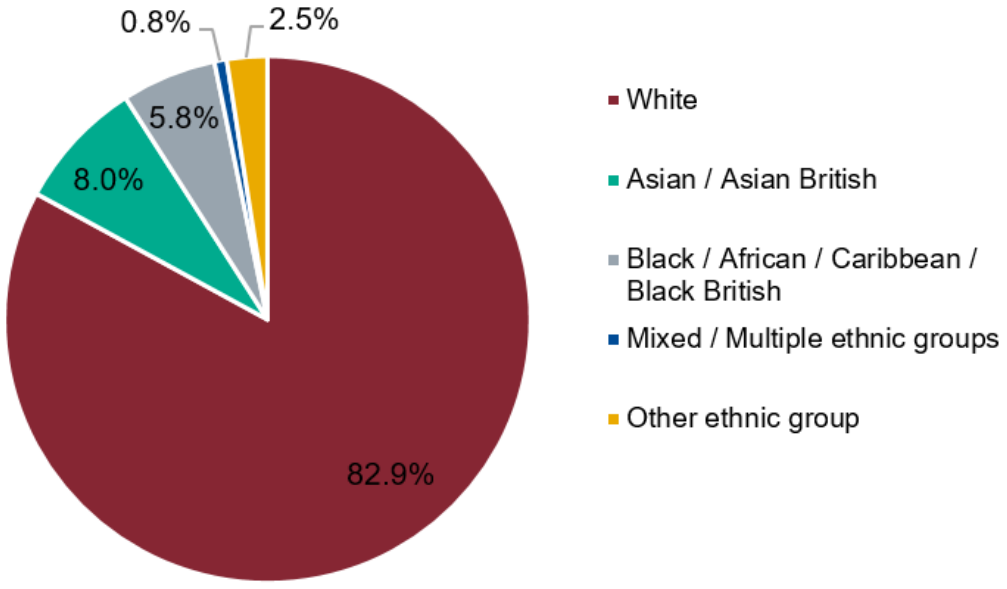
As of 5pm on 27 April, a total of 23,550 cases with confirmed COVID-19 have died in England.

Figure 19: Cumulative number of deaths by date of death and age group, England (n=23,550)



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

Figure 20: Ethnic group of confirmed COVID-19 deaths, England (n= 21,218)



Excess all-cause mortality, UK

In week 17 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 21). This data is provisional due to the time delay in registration; numbers may vary from week to week.

Figure 21: Weekly observed and expected number of all-cause deaths in all ages, with the dominant circulating influenza type(s), England, 2015 to week 17 2020

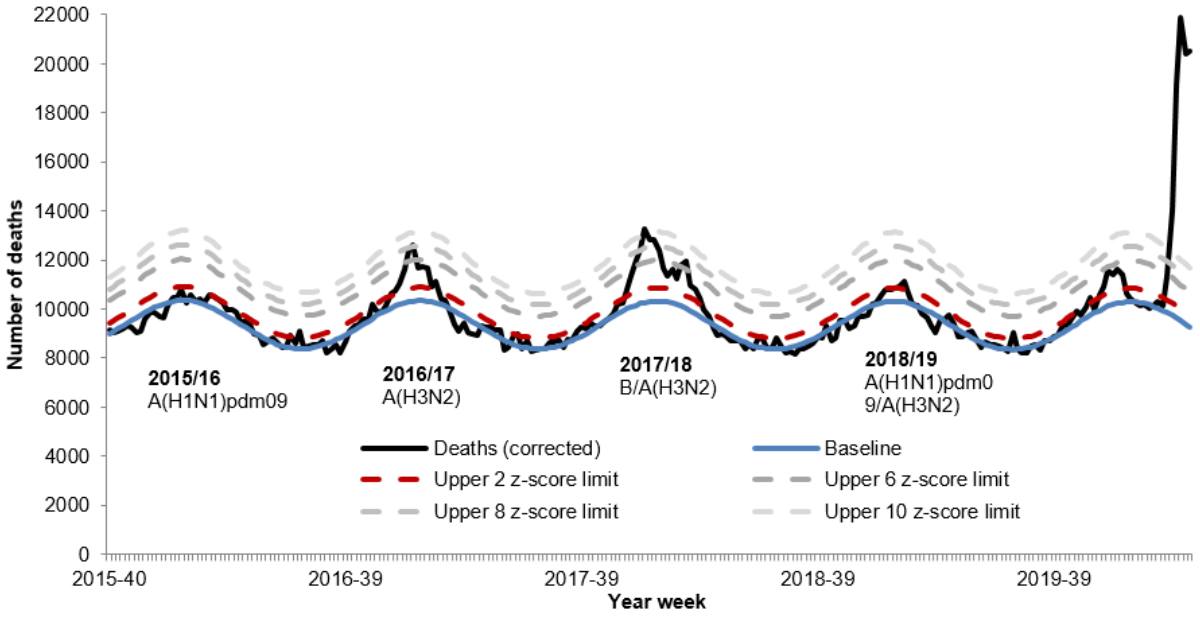


Table 3: Excess mortality by UK country, all ages*

Country	Excess detected in week 17 2020?	Weeks with excess in 2019/20
England	✓	44;47;49-02;12-17
Wales	x	51; 01;13-16
Northern Ireland	x	50-51; 03; 14-16
Country	**Excess detected in week 15 2020?**	**Weeks with excess in 2019/20**
Scotland	✓	41;46; 49-51; 01-02; 13-15

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

Global situation

Globally, up to 29 April 2020, a total of 3,032,115 laboratory-confirmed cases of COVID-19 infection have been reported worldwide, including 217,913 COVID-19 related deaths.

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