



Public Health
England

Protecting and improving the nation's health

Surveillance of influenza and other seasonal respiratory viruses in the UK Winter 2020 to 2021

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Glossary

Acronym	Meaning
ARI	Acute respiratory infections
CHESS	COVID-19 Hospitalisations in England Surveillance System
COVID-19	Coronavirus disease 2019
ECDC	European Centre for Disease Control
ECMO	Extracorporeal membrane oxygenation
ECOSS	Electronic Communication of Surveillance in Scotland
ED	Emergency department
EDSSS	Emergency Department Syndromic Surveillance System
GP	General practitioner
GPIH	GP in-hours
GPOOH	GP out-of-hours
HCW	Healthcare workers
HDU	High dependency unit
hMPV	Human metapneumovirus
ICU	Intensive care unit
ILI	Influenza-like illness
LAIV	Live attenuated influenza vaccine
MEM	Moving epidemic method
MERS-CoV	Middle East respiratory syndrome coronavirus
NIS	National Infection Service
PHA	Public Health Agency of Northern Ireland
PHE	Public Health England
PHS	Public Health Scotland
PHW	Public Health Wales
RCGP	Royal College of General Practitioners
RSV	Respiratory syncytial virus
RVU	Respiratory Virus Unit
SARI	Severe acute respiratory infection
SARS-CoV-2	Severe acute respiratory syndrome coronavirus 2
SRF	Severe respiratory failure
UCL	University College London
USISS	UK Severe Influenza Surveillance Systems
WHO	World Health Organization

Executive Summary

This report describes surveillance findings for seasonal influenza, other seasonal respiratory viruses and the monitoring of human cases of avian influenza and Middle-East respiratory syndrome coronavirus MERS-CoV. In the 2020 to 2021 season, extremely low levels of influenza activity were seen across the UK, with the majority of indicators remaining at or below inter-seasonal levels across the entirety of the season.

Due to the COVID-19 pandemic, data reported from the various influenza surveillance systems must be interpreted with caution and increases seen in some indicators may not accurately reflect influenza activity but rather COVID-19 activity. Interpretation of influenza surveillance data should take into account the impact of public health messaging, social and physical distancing measures, national lockdowns, a lack of international travel and the wearing of face coverings, as well as potential changes in health seeking behaviours due to the ongoing COVID-19 pandemic.

In primary care, GP influenza-like illness (ILI) consultation rates across the UK remained below baseline intensity levels for the duration of the 2020 to 2021 season and were much lower than rates seen in previous seasons.

In secondary care, both hospital and ICU/HDU admissions remained below the baseline threshold levels for the duration of the season and were much lower than admission rates seen in previous seasons.

The 2020 to 2021 season saw the extension of the flu vaccine programme to include 50 to 64 year olds (dependent on supply). The childhood programme was also extended in England and Northern Ireland to include children in Year 7 (11 year olds rising to 12 year olds), and in Northern Ireland to Year 8 children (11 year olds rising to 12 year olds).

Vaccine uptake in England varied by cohort for the 2020 to 2021 season. Vaccine uptake in the 65 years and over cohort and the 2 and 3 year old cohorts is the highest ever achieved. Vaccine uptake in the 65 years and over cohort was 80.9%, compared to 72.4% in 2019 to 2020, and uptake in the 2 and 3 year old cohorts 56.7% compared to 43.8% in 2019 to 2020. Vaccine uptake in the clinically at-risk cohorts is higher than ever previous recorded, at 53.0%, compared to 44.9% in 2019 to 2020. Vaccine uptake in pregnant women in England in the 2020 to 2021 season remained stable at 43.6%, compared to 43.7% in 2019 to 2020.

Influenza vaccine uptake in frontline healthcare workers (HCWs) in England is reported at 76.8%. This is the highest uptake ever achieved and higher than the previous seasons' end of season total (74.3%).

Vaccine uptake in school aged children in England was 61.7% (Reception to Year 7) compared to 60.4% (Reception to Year 6) in the previous season.

Vaccine uptake varied across Wales, Scotland and Northern Ireland, with increases in uptake seen in the majority of eligible cohorts compared to the previous season.

Activity from other circulating seasonal respiratory viruses, including respiratory syncytial virus (RSV), were much lower than levels seen in previous seasons. Rhinovirus activity was high at the beginning of the season before falling to low levels and then increasing towards the end of the season.

Novel respiratory viruses including MERS-CoV and avian-origin influenza viruses, have continued to result in human cases in affected countries. Surveillance and public health measures established in the UK for travellers returning with severe respiratory disease from affected countries are ongoing.

Background

Surveillance of influenza and other respiratory viruses in the United Kingdom (UK) is undertaken throughout the year and collated on behalf of the countries of the UK by the Influenza Surveillance Team at Public Health England's National Infection Service (PHE NIS). This is in collaboration with teams within PHE, Public Health Scotland (PHS, formerly Health Protection Scotland (1)), Public Health Wales (PHW) (2) and the Public Health Agency (PHA) Northern Ireland (3), who are each responsible for monitoring influenza activity for their respective countries.

Weekly outputs on influenza are normally published during the winter season between October (week 40) and May (week 20), the period when influenza typically circulates. From the 2020 to 2021 season, reports containing surveillance data on both influenza and COVID-19 were published on a weekly basis (4). A variety of data sources are collated to provide information on influenza activity and to provide rapid estimates of influenza-related burden within the community, on the health service and in excess all-cause mortality. In addition, in-season and end-of-season monitoring of seasonal influenza vaccine uptake and vaccine effectiveness is undertaken. Due to extremely low levels of circulating influenza during the 2020 to 2021 season, certain aspects of surveillance were not possible during this season, including virus characterisation and vaccine effectiveness estimates.

The moving epidemic method (MEM) (5) is used by the European Centre for Disease Prevention and Control (ECDC) to standardise reporting of influenza activity across Europe. It has been adopted by the UK and is publicly presented for GP influenza-like illness (ILI) consultation rates for each UK scheme, for the proportion of samples positive for influenza through the respiratory DataMart scheme and for the hospitalisation and intensive care unit (ICU) admissions rate through the SARI Watch scheme.

During the 2020 to 2021 season, the roll-out of the licensed live attenuated influenza vaccine (LAIV) in children continued. In England, LAIV was offered to all 2 and 3 year olds through primary care and to children in Reception, Year 1, Year 2, Year 3, Year 4, Year 5, Year 6 and Year 7 (4 to 11 year olds rising to 12 year olds) through schools this year. This is the first influenza season in England where children in Year 7 have been offered vaccination through the schools' programme. LAIV is offered to all primary school aged children in the UK, as well as children in the first year of secondary school in England and Northern Ireland. During the 2020 to 2021 season, influenza vaccination was also offered to individuals between 50 and 64 years for the first time, from the 1 of December 2020 (6).

PHE also carries out surveillance for novel respiratory viruses, including Middle East respiratory syndrome coronavirus (MERS-CoV) which was first recognised in September 2012; human infection with avian influenza such as influenza A(H7N9) which emerged in China in 2013; influenza A(H5N1) which emerged in China in 2003 and influenza A(H5N6) which has been seen in China since 2013.

SARS-CoV-2, which causes COVID-19, emerged in China in December 2019. The virus spread worldwide and a pandemic was declared by the World Health Organization (WHO) on 11 March 2020. PHE created new surveillance systems and adapted existing influenza surveillance systems to monitor epidemiological trends in COVID-19 and began publishing weekly national COVID-19 surveillance reports from April 2020 (7). Since October 2020 a weekly surveillance report has been published, which presents both influenza and COVID-19 data side by side (4). COVID-19 has impacted on various influenza indicators presented in this report. Measures put in place to control the COVID-19 pandemic have impacted on influenza activity. These measures include public health messaging, social and physical distancing measures, national lockdowns, the wearing of face coverings, hand hygiene and travel restrictions. Changes in healthcare-seeking behaviour may also impact some influenza indicators during the course of the pandemic. All of this should be considered when interpreting influenza surveillance indicators presented in this report.

This report describes influenza activity observed in the UK in the period from week 40 2020 (week ending 28 September 2020) to week 14 2021 (week ending 11 April 2021). Please note that due to the 2020 to 2021 season including a week 53, an average of week 52 and 53 are shown on figures comparing the 2020 to 2021 season to previous seasons.

This report includes observations and commentary on influenza activity, activity of other seasonal and novel respiratory viruses and from the influenza vaccination programme.

Community Surveillance

Syndromic Surveillance

In England, national PHE real-time syndromic surveillance systems (8) including GP in hours (GPIH) consultations and out-of-hours (GPOOH) contacts, emergency department attendances (Emergency Department Syndromic Surveillance System (EDSSS)) and NHS 111 calls and online assessments, monitor a range of indicators sensitive to community influenza activity, for example NHS 111 'cold' or flu calls and GP in-hours consultations for influenza-like illness (ILI).

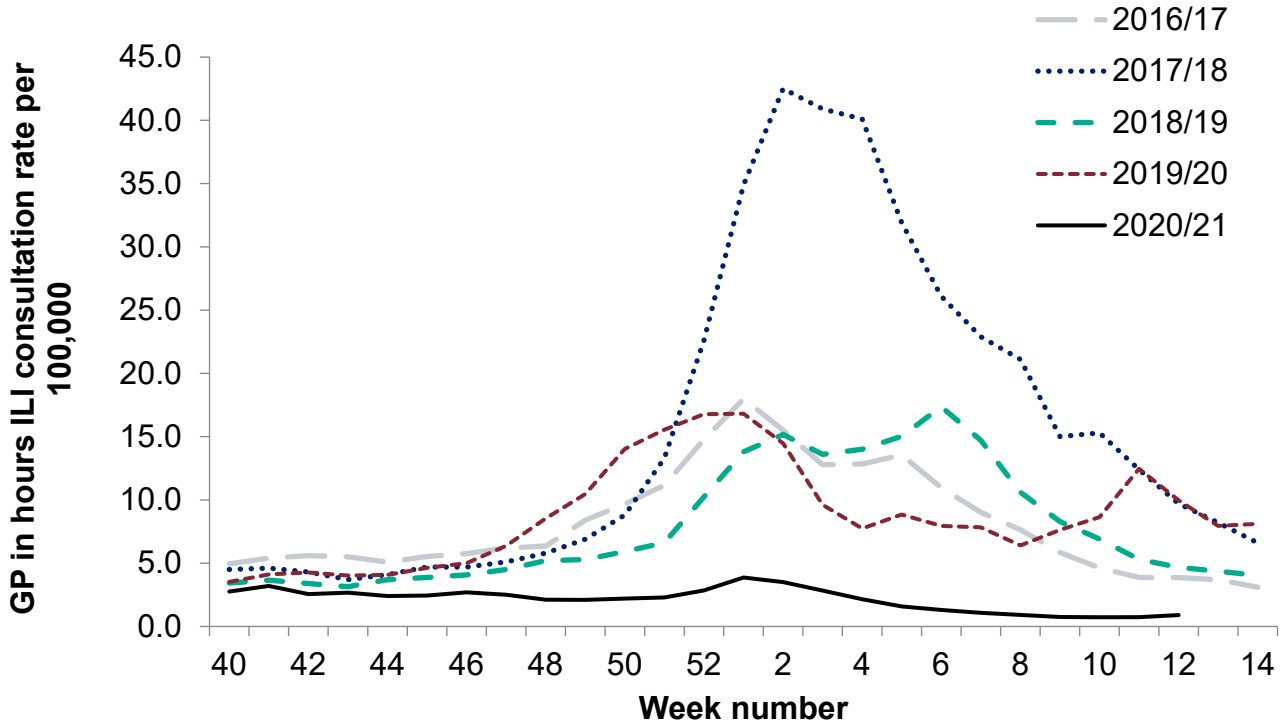
COVID-19 activity caused an increase in the use of ILI codes and other similar codes in the late stages of the 2019 to 2020 season in England. COVID-19 specific codes were then available for use during the 2020 to 2021 season, so ILI (and similar) codes will not have been used to record COVID-19-like attendances, and many consultations that would, in previous seasons, have been coded to ILI are likely to have been assigned to COVID codes in 2020 to 2021 season. This should be noted when comparing to the rates from the 2020 to 2021 season to previous seasons. Healthcare-seeking behaviour has also been impacted during the COVID-19 pandemic due to periods of national lockdown and changes in guidance on how the public should access healthcare services. Syndromic data should therefore be interpreted with some caution.

During winter 2020 to 2021, syndromic surveillance indicators for GPIH ILI consultations remained low throughout the season and much lower than seen in previous seasons. Similarly, GPIH pneumonia consultations remained at low levels throughout the season, and at much lower levels than seen in previous seasons (Figure 1).

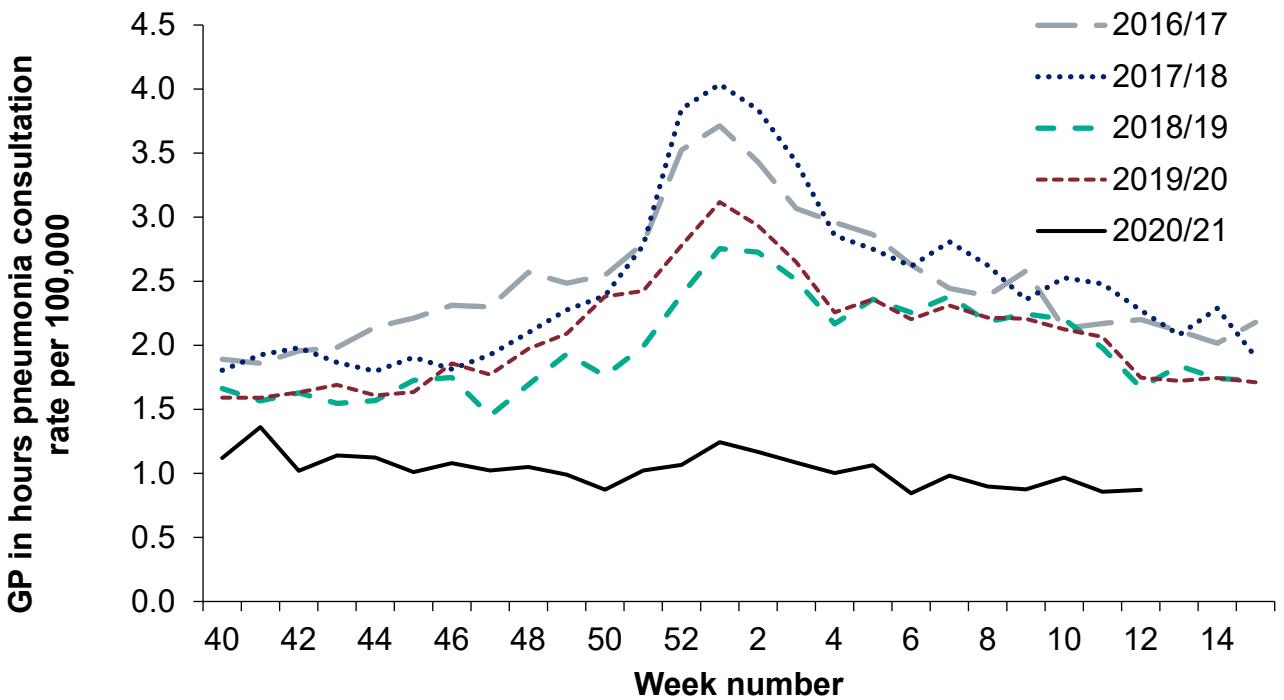
GPOOH ILI contacts remained lower than that seen in previous seasons, while GPOOH acute respiratory infection (ARI) contacts remained lower than that seen in previous seasons (Figure 1).

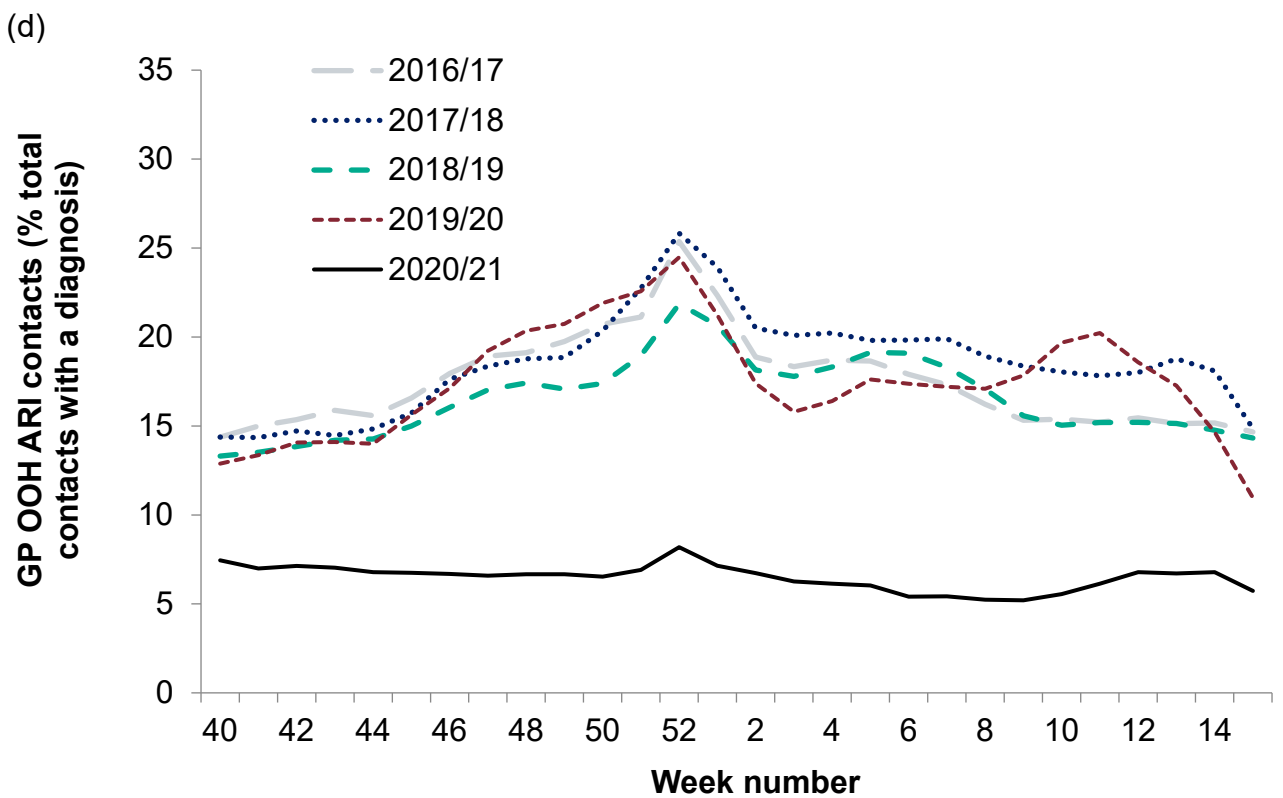
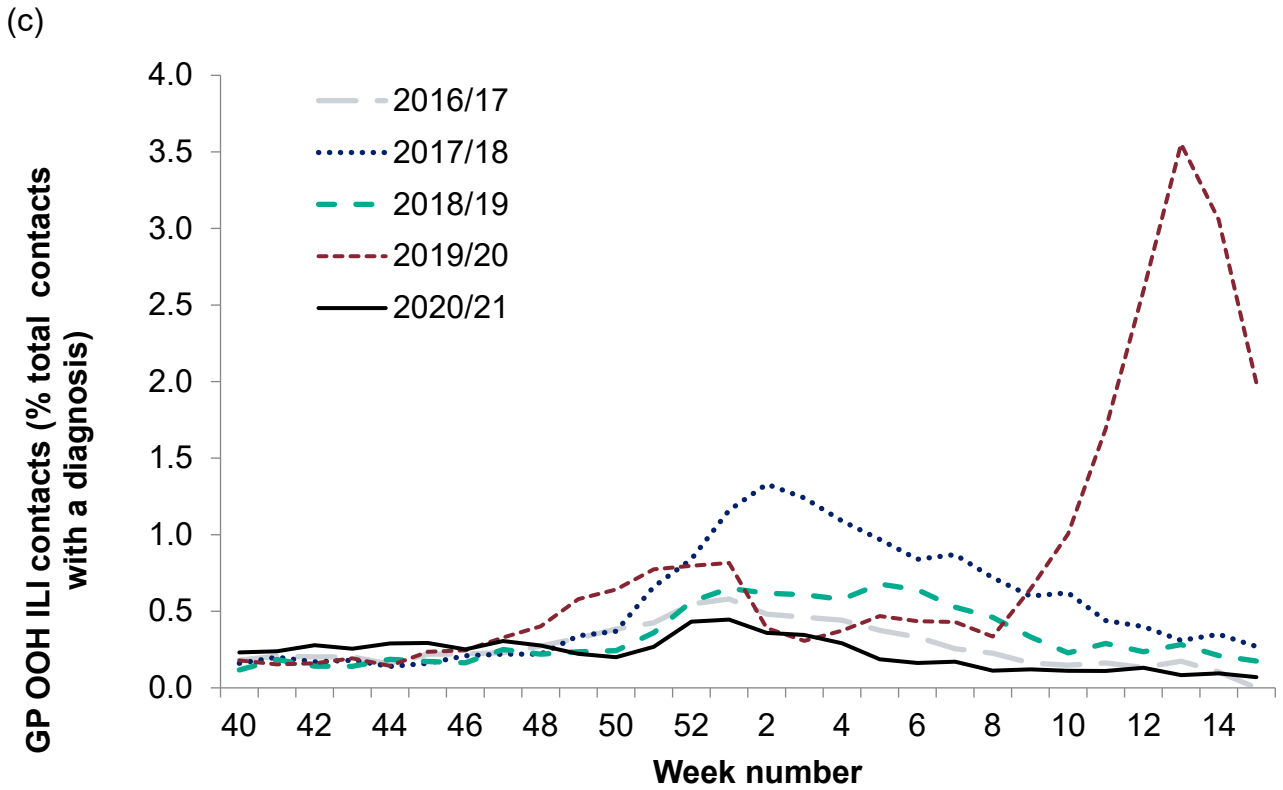
Figure 1. Weekly all age (a) GP in hours consultations for influenza-like illness (ILI) (b) GP in hours consultations for pneumonia (c) GP out of hours (OOH) contacts for ILI (d) GP out of hours contacts for acute respiratory infections (ARI) for winter 2016 to 2021, England

(a)



(b)

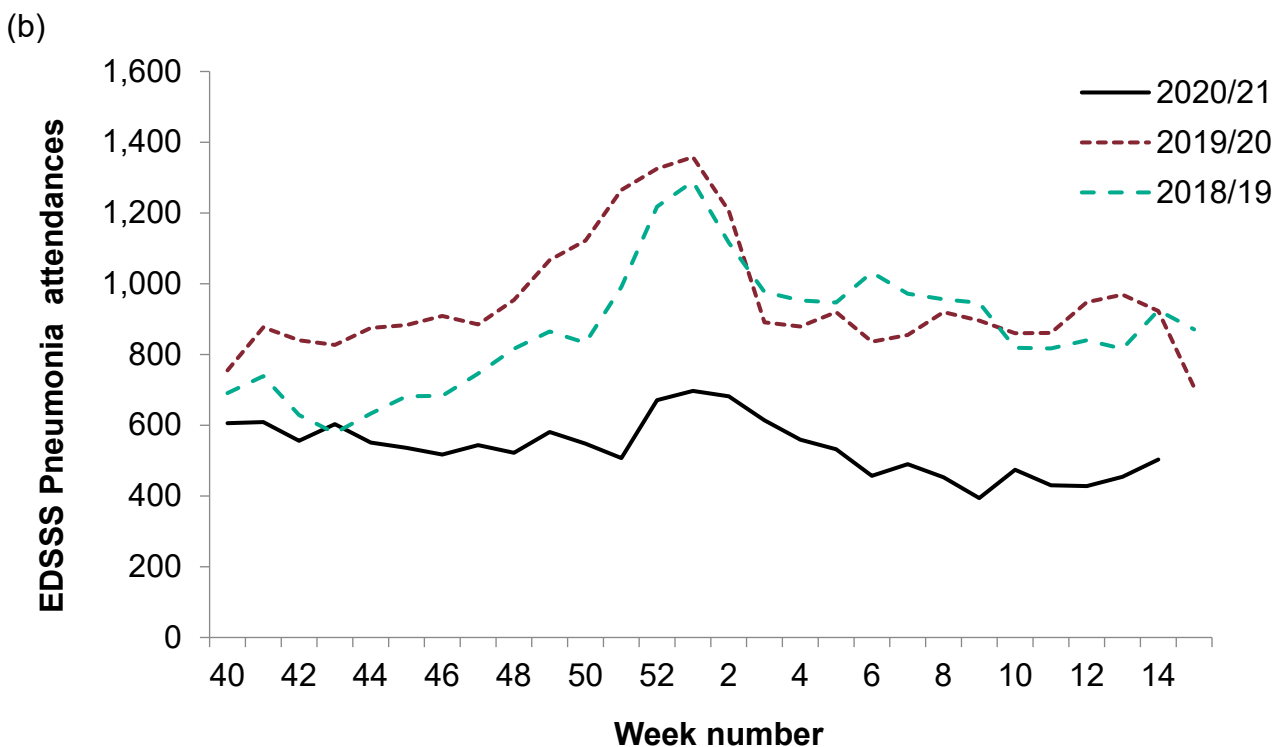
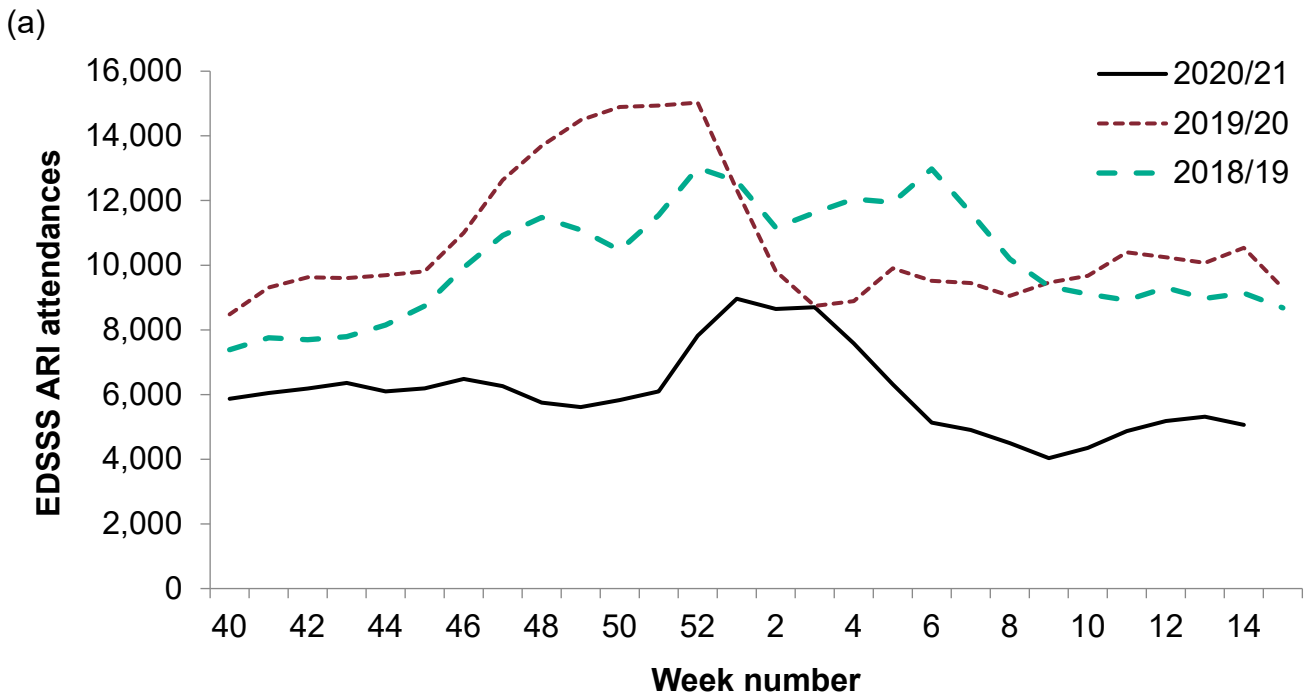




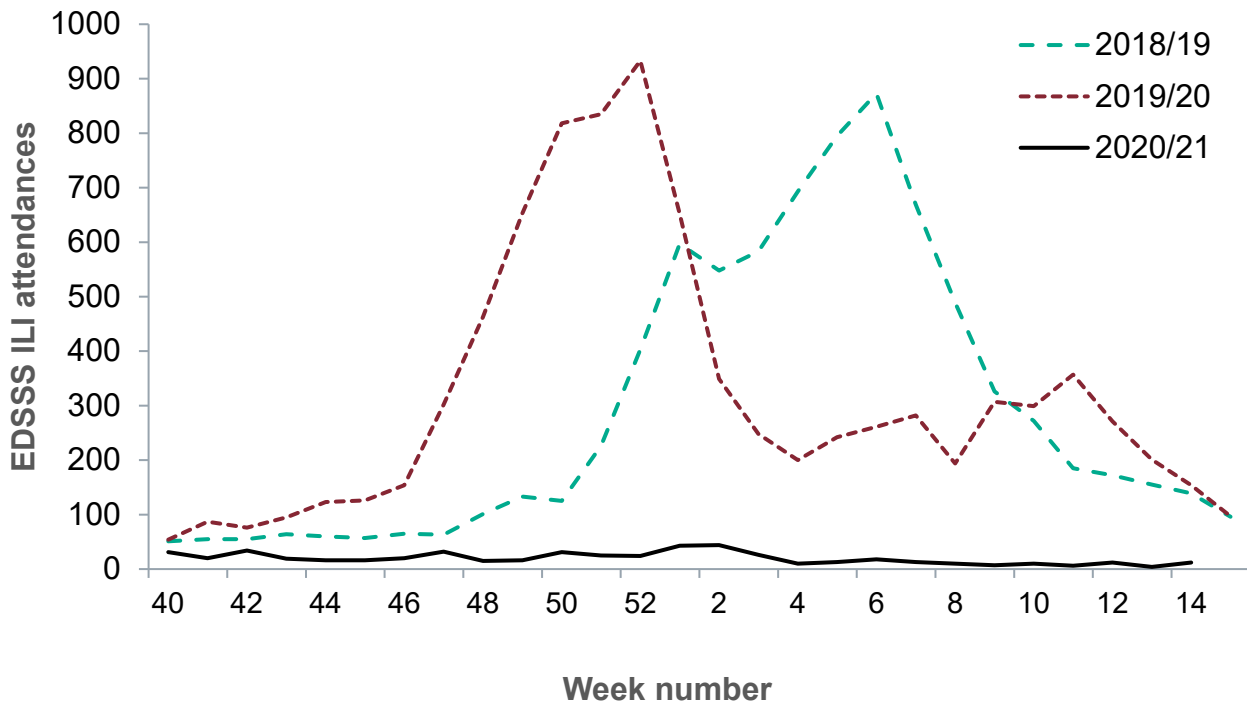
ARI emergency department (ED) attendances remained lower throughout the 2020 to 2021 season, with slightly higher levels seen between week 52 and week 4 (Figure 2). This increase is likely to reflect COVID-19 activity (which is included in the ARI indicator), rather than influenza activity. Pneumonia ED attendances remained low throughout the season, and at much lower levels than seen in previous seasons (Figure 2). ILI ED attendances remained low throughout the season (Figure 2).

ED attendances data presented in this year’s report represent 84 EDs that reported throughout the most recent 3 influenza seasons. Therefore, numbers may differ slightly from those presented in the 2019 to 2020 annual report as a different number of EDs were included.

Figure 2. Weekly all age (a) Emergency Department Syndromic Surveillance System (EDSSS) acute respiratory infection (ARI) attendances (b) EDSSS pneumonia attendances for winter 2018 to 2020

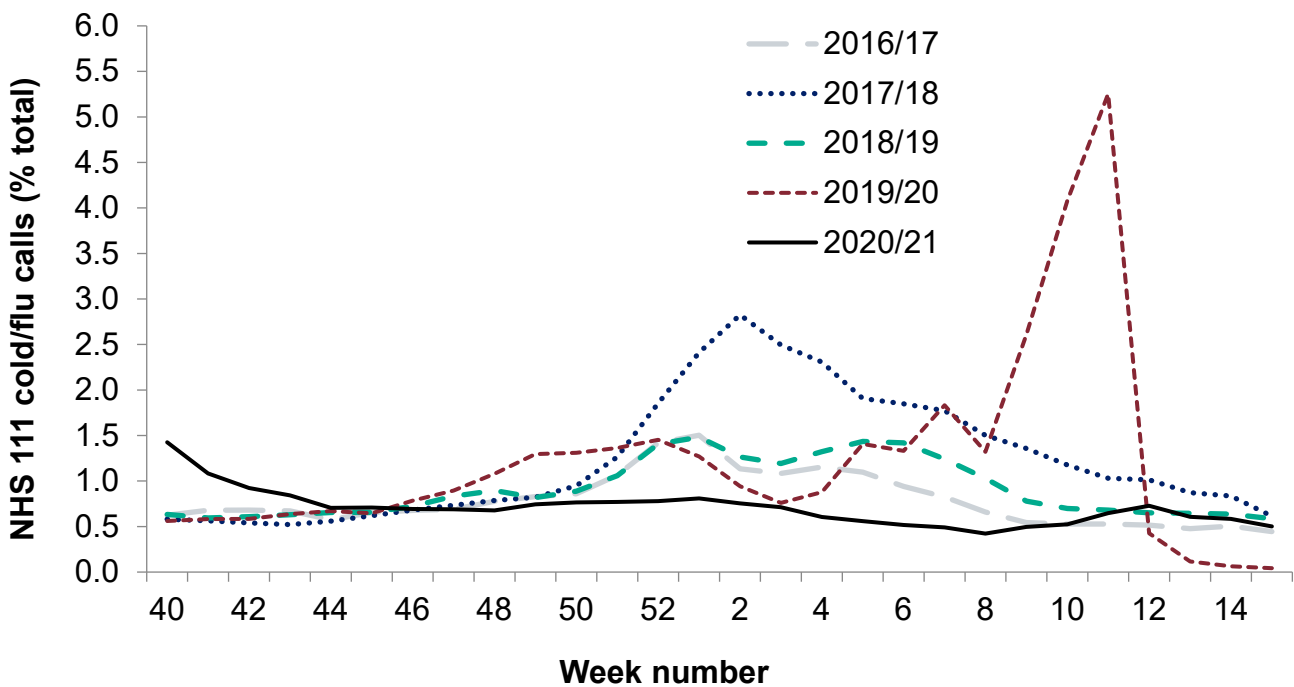


(c)



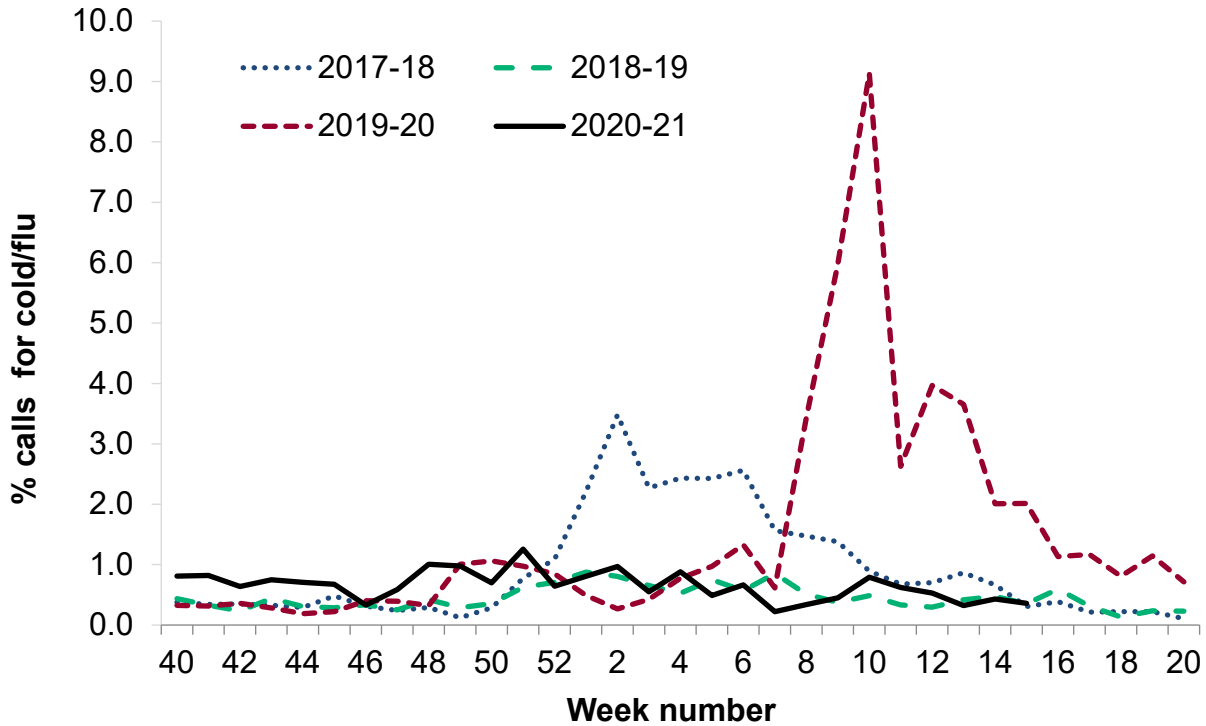
NHS 111 calls for cold or flu remained low throughout the majority of the 2020 to 2021 season. At the beginning of the season (week 40) higher levels of calls were observed following a large spike in cold or flu calls to NHS 111 which was driven largely by childhood age groups during the return to school following the extended lockdown or holiday period. Therefore, higher levels during week 40 to 43 2020 are unlikely to reflect cold or flu activity (Figure 3).

Figure 3. Weekly all age England NHS 111 cold or flu calls for winter 2016 to 2020



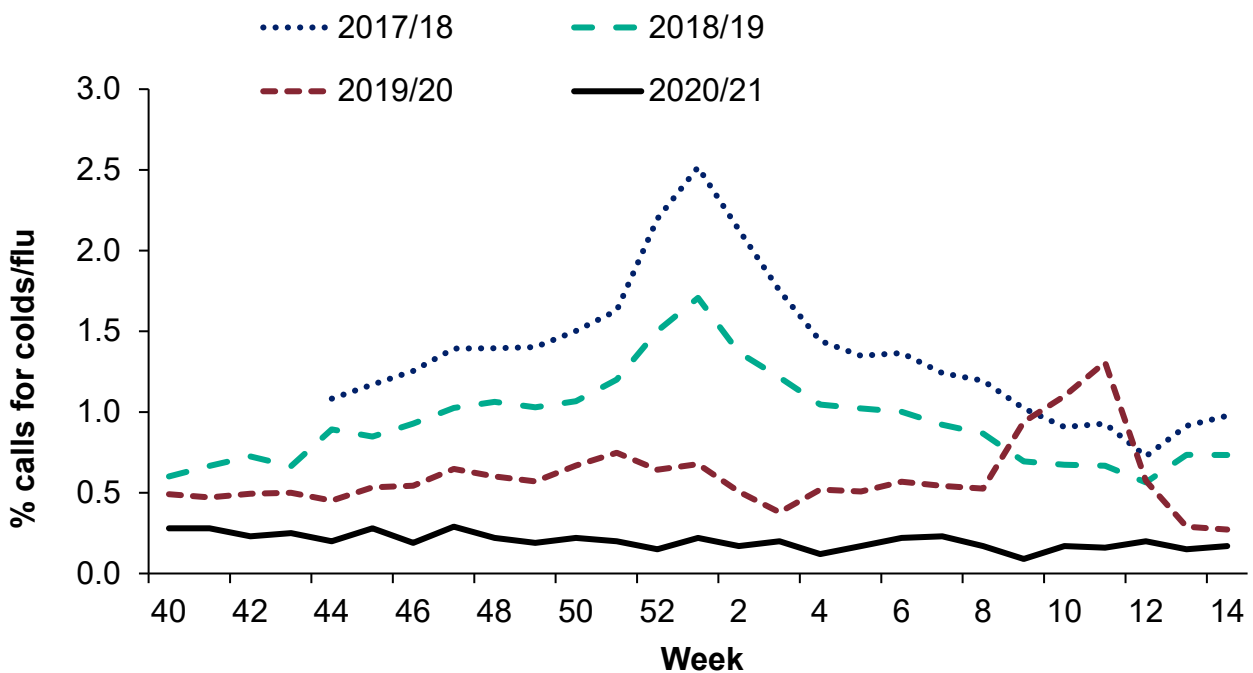
In Wales, the weekly proportion of all cold or flu calls made to NHS Direct Wales remained relatively low and constant throughout the season, with no peak in activity observed (Fig 4).

Figure 4. Weekly proportions of calls for cold or flu (all ages) to NHS-Direct, Wales, 2017 to 2021



In Scotland, the weekly proportion of all calls to NHS 24 which mention cold or flu, was low throughout the season and was much lower than seen in the previous 3 seasons (Figure 5).

Figure 5. Proportion of calls for cold or flu (all ages) through NHS 24, Scotland, 2017 to 2021



FluSurvey (Internet based surveillance)

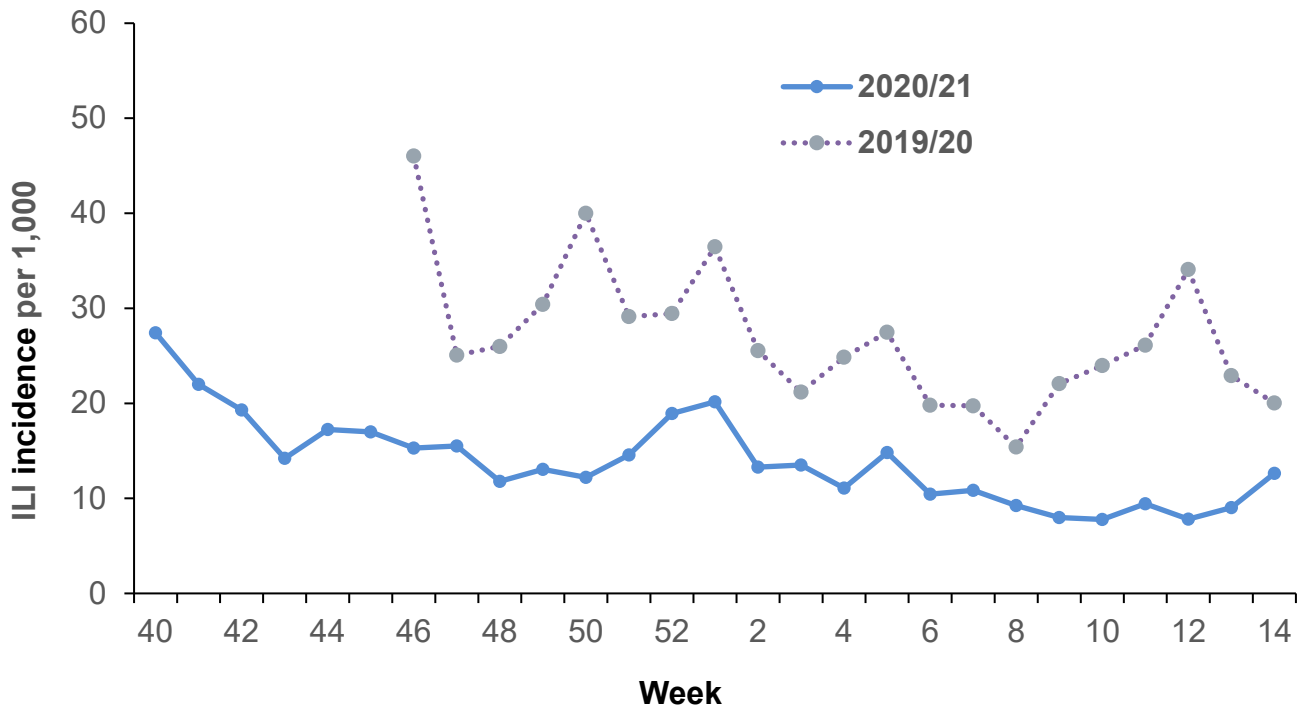
Flusurvey is part of a European wide initiative (including 10 European countries) run by Public Health England, that provides internet-based surveillance of ILI and COVID-19 symptoms in the UK population. On registration, individuals aged 18 and over complete a baseline profile questionnaire which collects information on demographic, geographic, socioeconomic (household size and composition, occupation, education, and transportation), and health (vaccination, diet, pregnancy, smoking, and underlying medical conditions) data. Subsequently, participants are sent weekly reminders via email to report any symptoms relating to flu or COVID-19 that they may have experienced and their health-seeking behaviour as a result of their symptoms. This creates a fast, reliable and flexible real-time monitoring surveillance system. Recruitment of survey participants remained open throughout the 2020 to 2021 season as a result of the ongoing pandemic.

A total of 7,384 participants were recruited of which 3,335 (45.2%) completed at least 1 survey contributing 93,374 real-time flu related symptoms data.

Characteristics of registered participants varied by age and gender. There were more participants in the 45 to 64 year age group (41.8%) compared to other age groups. There was a higher proportion of female participants compared to male participants (63.6% vs 36.4%). The majority (6,738; 90.9%) of participants were resident in England; 425 participants were from Scotland; 33 participants were from Northern Ireland and 209 from Wales.

Any participant completing the symptoms questionnaire during the reporting week was included in the analysis. The European Centre for Disease Control (ECDC) ILI case definition of sudden onset of symptoms and at least 1 of: fever, malaise, headache or muscle pain and at least 1 of: cough, sore throat, shortness of breath was applied. The total number of self-reported ILI cases was 1,299 (1.4%). Overall, self-reported ILI activity was low through the season and peaks were observed during weeks 40 and 53 (Figure 6). Further analysis of the 2020 to 2021 flu survey will be available on [the FluSurvey website](#) in the summer.

Figure 6. Weekly ILI incidence per 1,000 by reported through FluSurvey



Please note: FluSurvey reporting began in week 46 in the 2019 to 2020 season

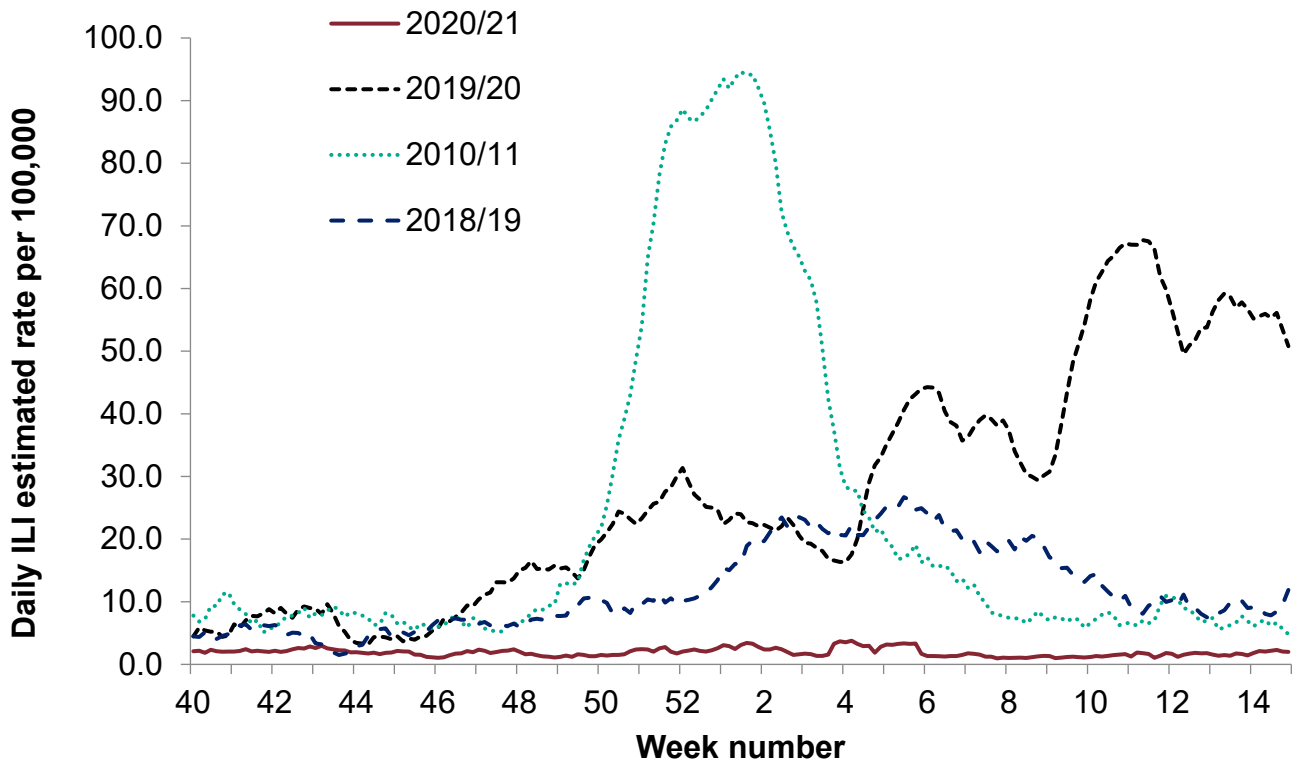
FluDetector (Internet based surveillance)

PHE collaborate with University College London (UCL) to assess the use of internet-based search queries as a surveillance method for ILI in England. This is part of work on early-warning surveillance systems for influenza, through the Engineering and Physical Sciences Research Council (EPSRC) Interdisciplinary Research Collaboration (IRC) project i-sense (8).

Combining natural language processing and machine learning techniques, a non-linear Gaussian process model was developed by UCL (10) to produce real-time estimates of ILI. The supervised model, trained on historical data from the Royal College of General Practitioners (RCGP) scheme (11) (2005 to 2006 to 2016 to 2017 seasons at national level), produces daily ILI estimates based on the proportion of ILI related search queries within a 10% to 15% sample of all queries issued, and is extracted daily from Google’s Health Trends Application Programming Interface.

Estimated rates of ILI remained extremely low throughout the 2020 to 2021 season and remained below the baseline threshold level of 19.6 per 100,000 (Figure 7).

Figure 7. Daily estimated ILI Google search query rates per 100,000 population



Influenza outbreaks

No confirmed influenza outbreaks were reported in the UK between week 40 2020 and week 14 2021. Further information on ARI incidents during the 2020 to 2021 season are available in the weekly influenza and COVID-19 surveillance report (4).

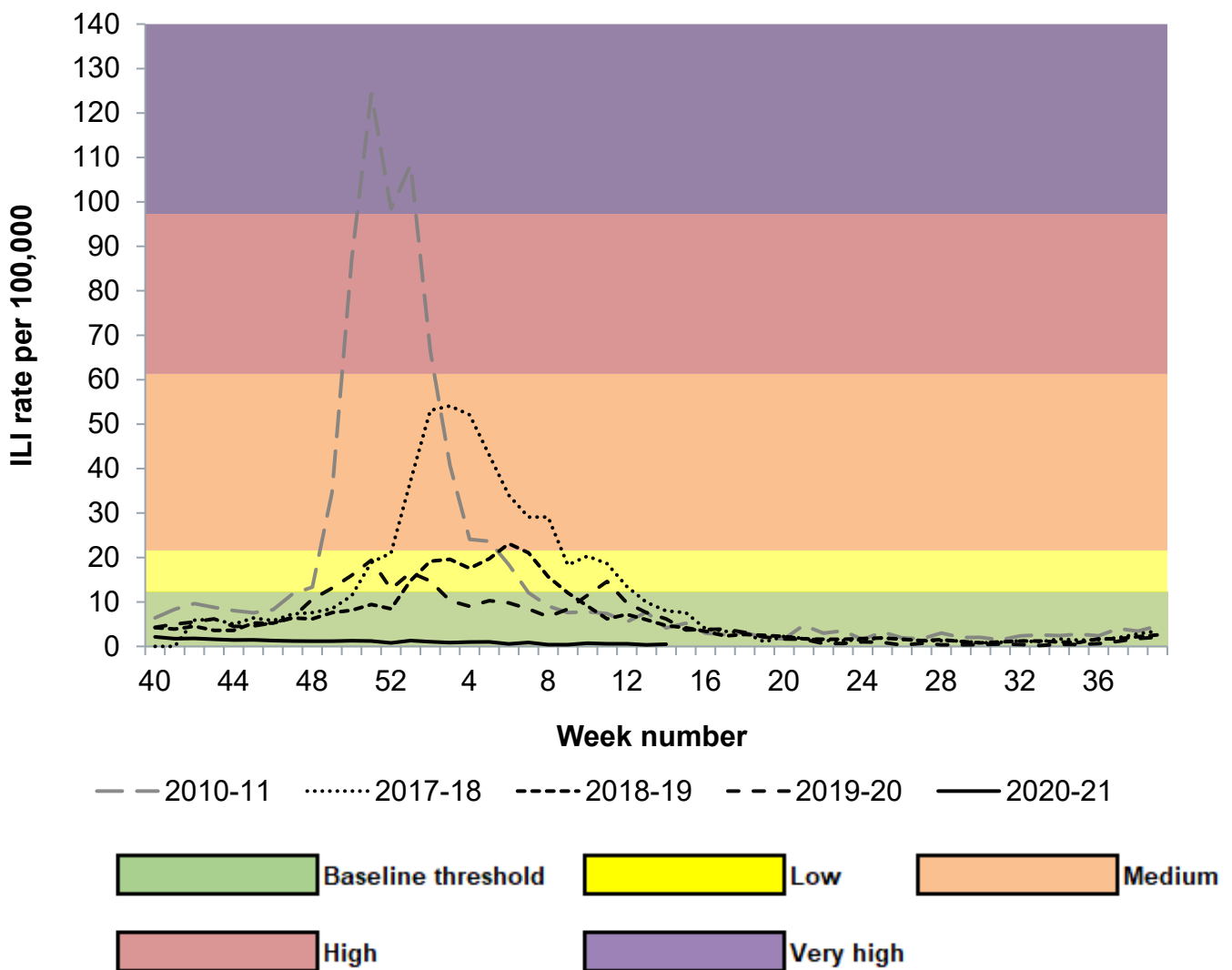
Primary Care Consultations

England

Weekly rates of General Practitioner (GP) consultations for influenza-like illness (ILI) through the Royal College of General Practitioners (RCGP) scheme remained below the 2020 to 2021 season moving epidemic method (MEM) baseline threshold of 12.2 per 100,000 for the duration of the influenza season (Figure 8).

The ILI rate for 2020 to 2021 remained much lower than rates observed in previous seasons. In 2019 to 2020, 2018 to 2019 and 2017 to 2018 the ILI rates were above the MEM baseline threshold levels for 6, 8 and 14 weeks respectively (Figure 8).

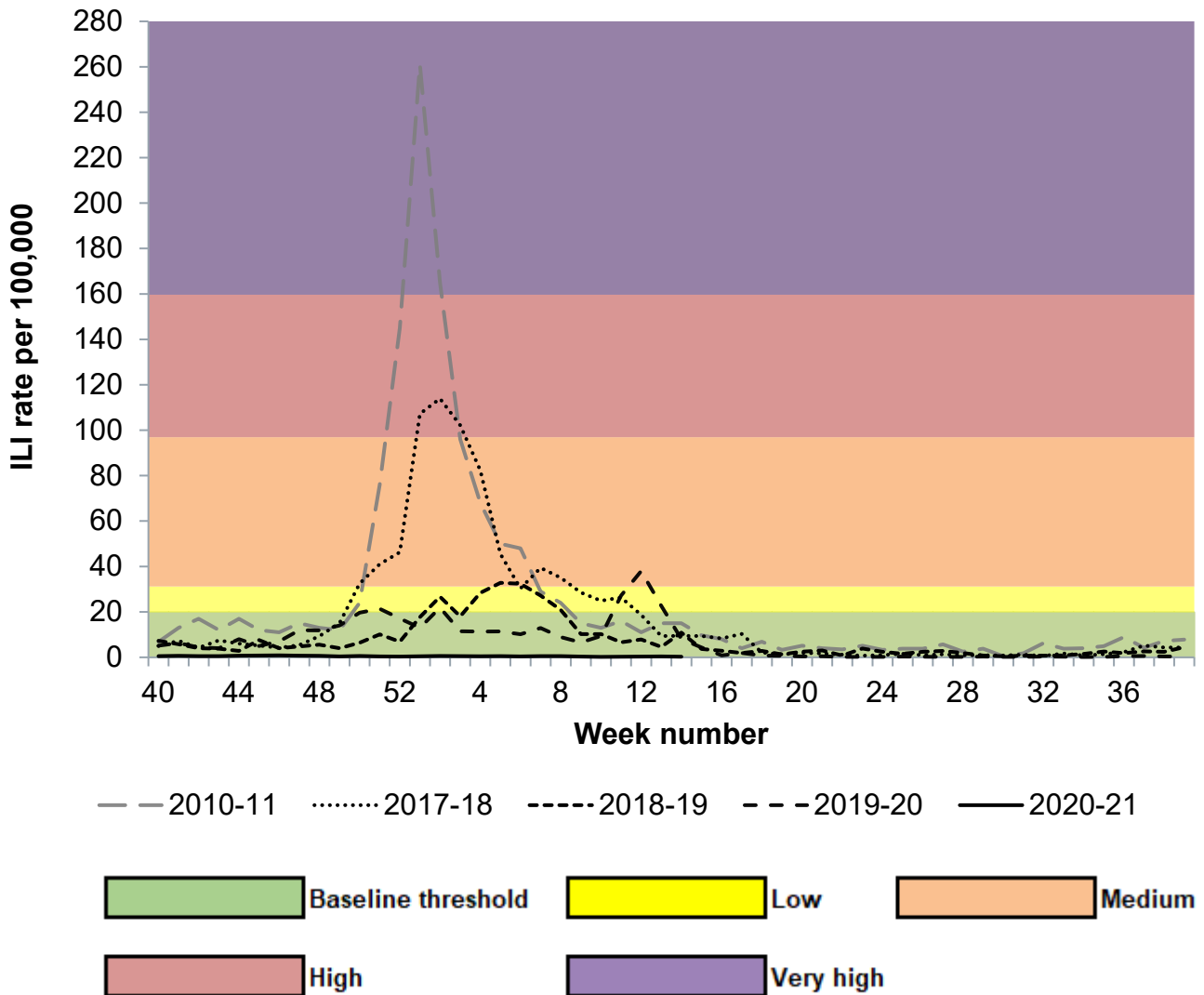
Figure 8. Weekly all age GP influenza-like illness rates for 2020 to 2021 and past seasons, England (RCGP)



Scotland

Weekly GP consultations for ILI remained below the baseline MEM threshold of 19.8 per 100,000 throughout the season in Scotland. Overall seasonal ILI activity was at much lower intensity compared to previous seasons (Figure 9).

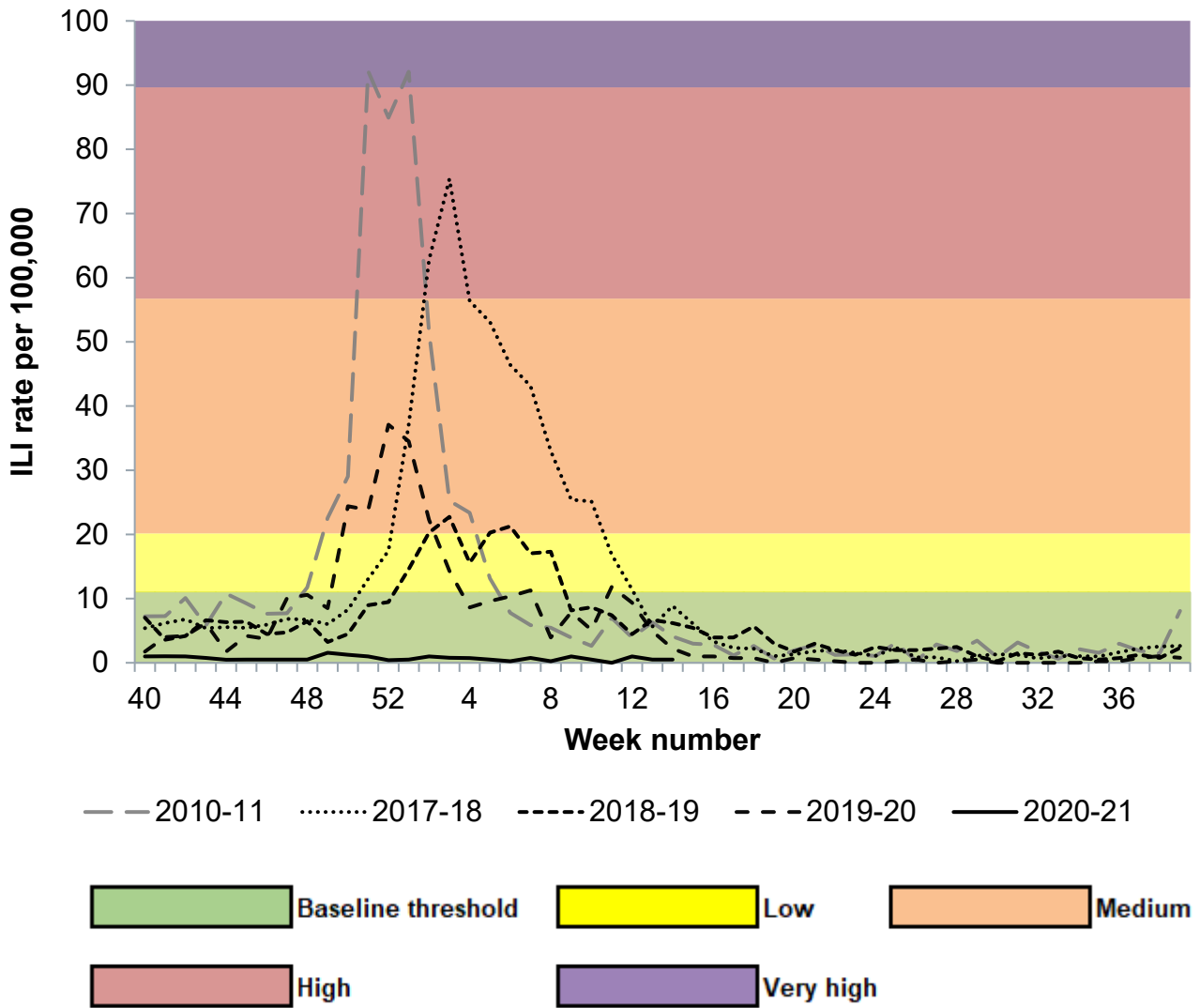
Figure 9. Weekly all age GP influenza-like illness rates for 2020 to 2021 and past seasons, Scotland



Wales

Weekly GP consultations for ILI in Wales remained below the baseline MEM threshold of 10.97 per 100,000 for the duration of the 2020 to 2021 season. Rates remained at much lower intensity level than rates observed in previous seasons (Figure 10).

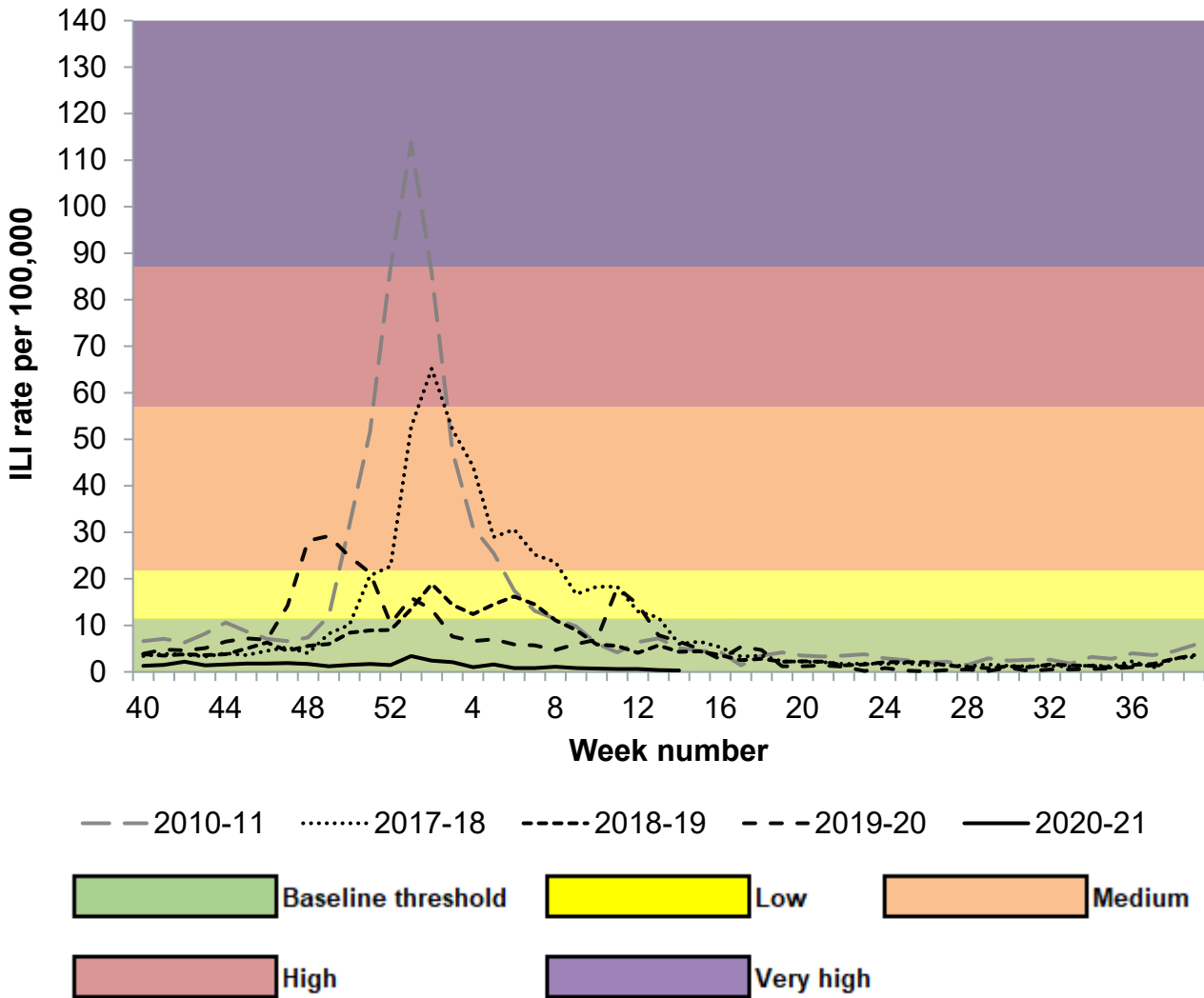
Figure 10. Weekly all age GP influenza-like illness rates for 2020 to 2021 and past seasons, Wales



Northern Ireland

Weekly GP consultations for ILI in Northern Ireland remained below the baseline MEM threshold of 11.3 per 100,000 for the duration of the season. Rates remained at much lower intensity levels than seen in previous seasons (Figure 11).

Figure 11. Weekly all age GP influenza-like illness rates for 2020 to 2021 and past seasons, Northern Ireland



Secondary Care Surveillance

The Severe Acute Respiratory Infection (SARI) Watch surveillance system was established in 2020 to report the number of laboratory confirmed influenza, COVID-19 and RSV cases admitted to hospital and critical care units (ICU/HDU) in NHS acute trusts across England. This has replaced the UK Severe Influenza Surveillance System (USISS) mandatory and sentinel data collections for influenza surveillance used in previous seasons, and the COVID-19 hospitalisations in England surveillance system (CHESS) collections for COVID-19 surveillance.

The weekly rate of new admissions of influenza cases is based on the catchment population of those NHS Trusts who made a return in that week.

The MEM method has been applied to the SARI Watch hospital and ICU/HDU admissions for confirmed influenza to assess the impact of influenza activity throughout the season.

Hospitalisations

Through SARI Watch, a total of 40 hospitalised confirmed influenza cases were reported from 56 participating sentinel NHS acute trusts across England from week 40 2020 to week 14 2021, including sentinel sites submitting a nil return. This compares to a total of 4,918 cases from 22 participating trusts in 2019 to 2020, 5,667 cases from 24 participating trusts in 2018 to 2019, and 10,107 cases from 25 participating trusts in 2017 to 2018 (Figure 12). Please note that the hospital admissions data collection ended in week 14 during the 2019 to 2020 season, due to pressures related to the COVID-19 pandemic.

Hospital admission rates for confirmed influenza remained below the baseline threshold level (0.99 per 100,000 trust catchment population) for the duration of the influenza season (Figure 12).

Of the 40 influenza hospital admissions reported up to week 14 2021, 3 were influenza A(H1N1)pdm09, 3 were influenza A(H3N2), 15 were influenza A(not subtyped) and 19 were influenza B (Figure 13).

Weekly confirmed influenza hospitalisation rates to sentinel hospital trusts in England since winter 2010 are shown in Figure 14.

Figure 12. Weekly overall number of influenza hospital admissions and influenza hospital admission rates per 100,000 trust catchment population with MEM thresholds, SARI Watch, England

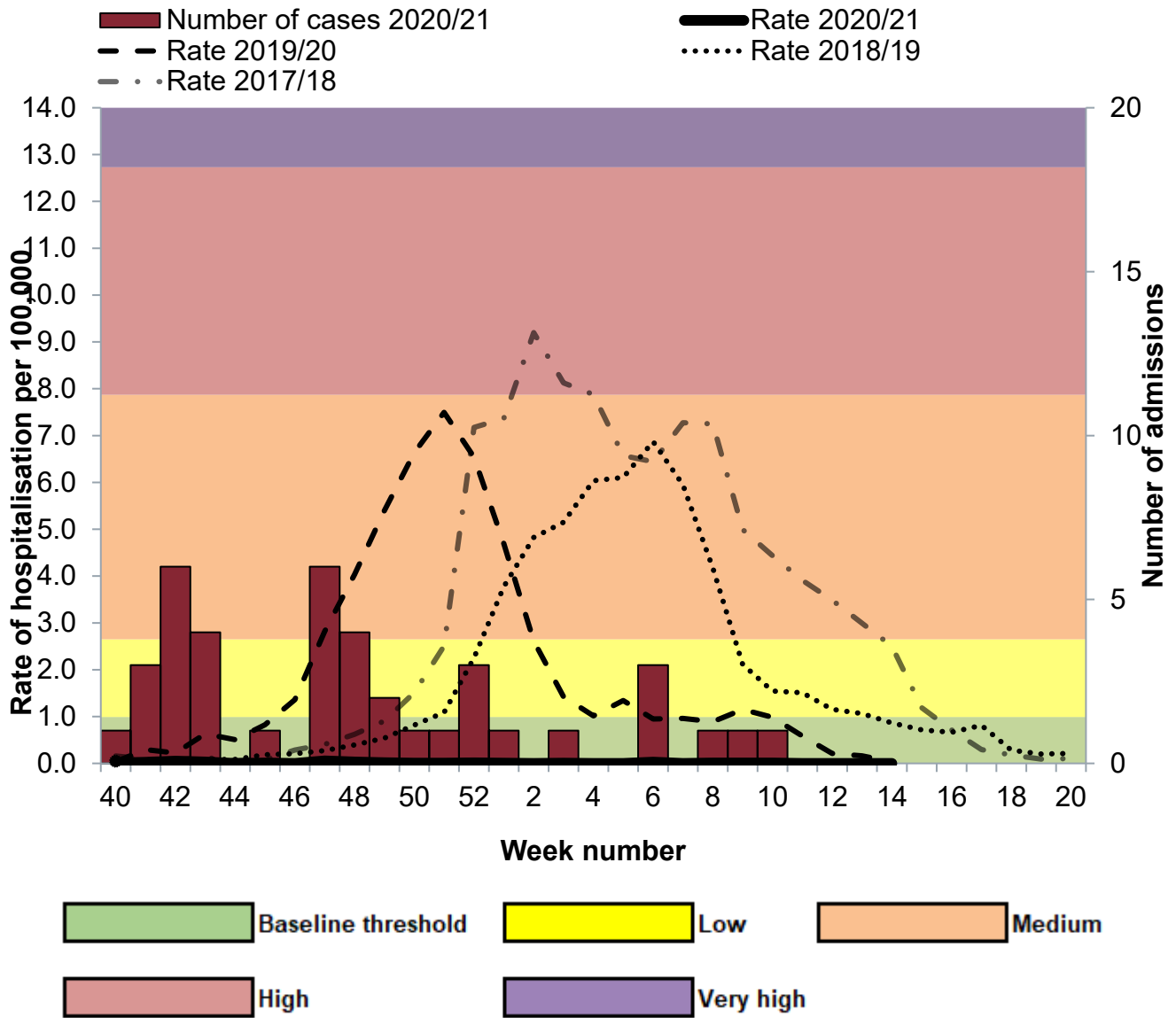


Figure 13. Cumulative number of influenza hospital admissions by influenza type, SARI Watch, England, week 40 2020 to week 14 2021

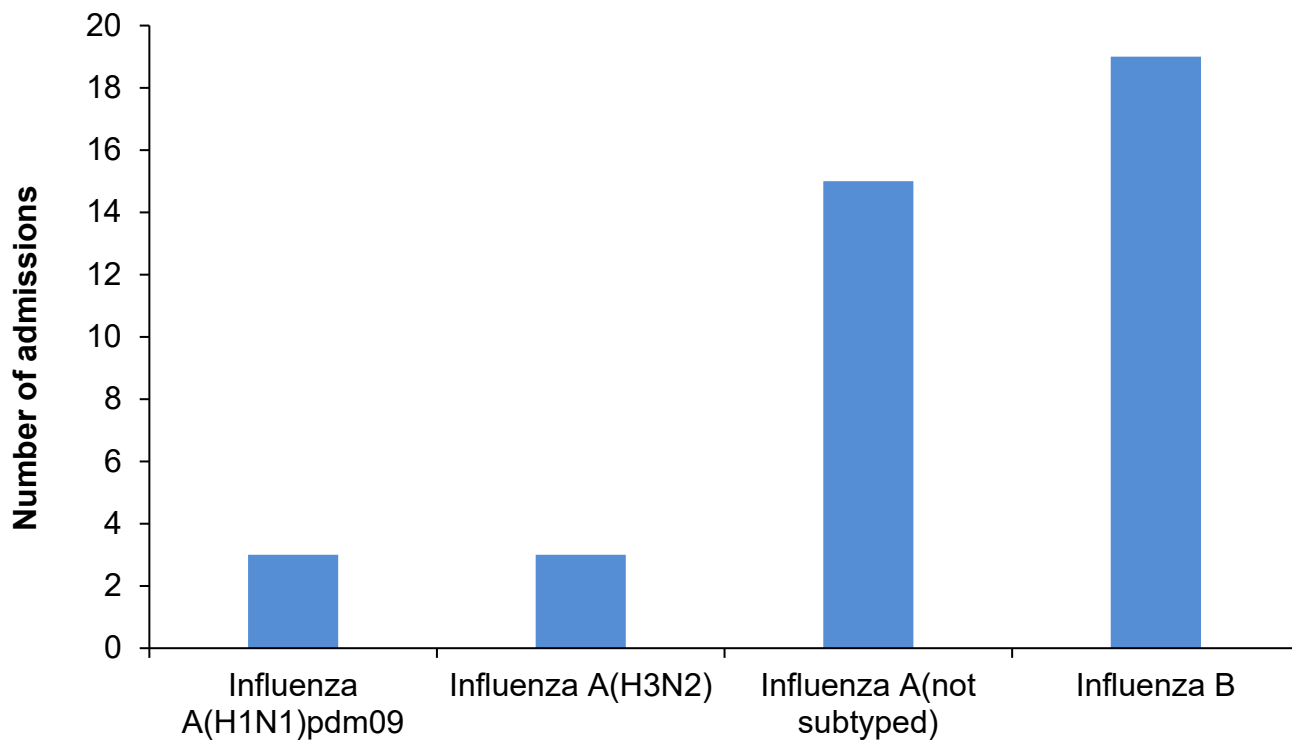
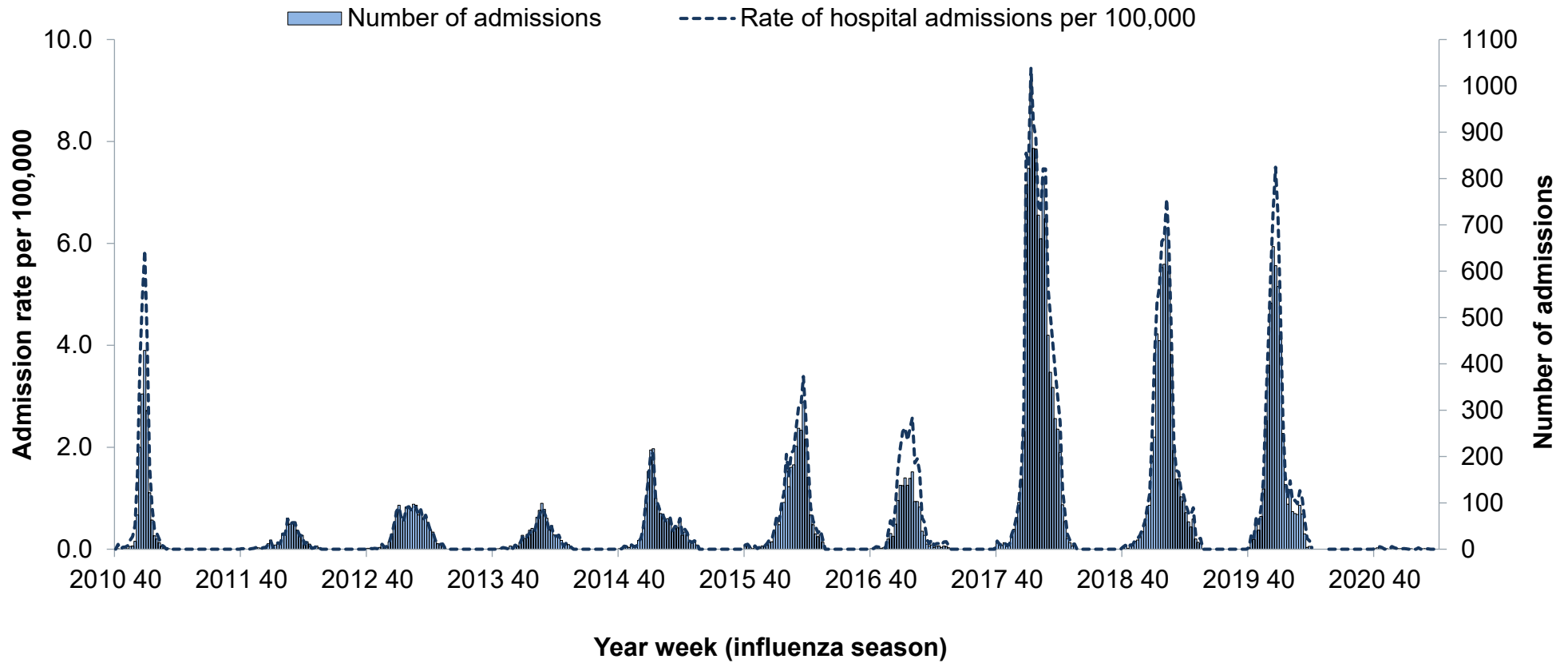


Figure 14. Weekly number of confirmed influenza hospital admissions with crude hospitalisation rate for all ages, 2010 to 2021, England



ICU/HDU admissions

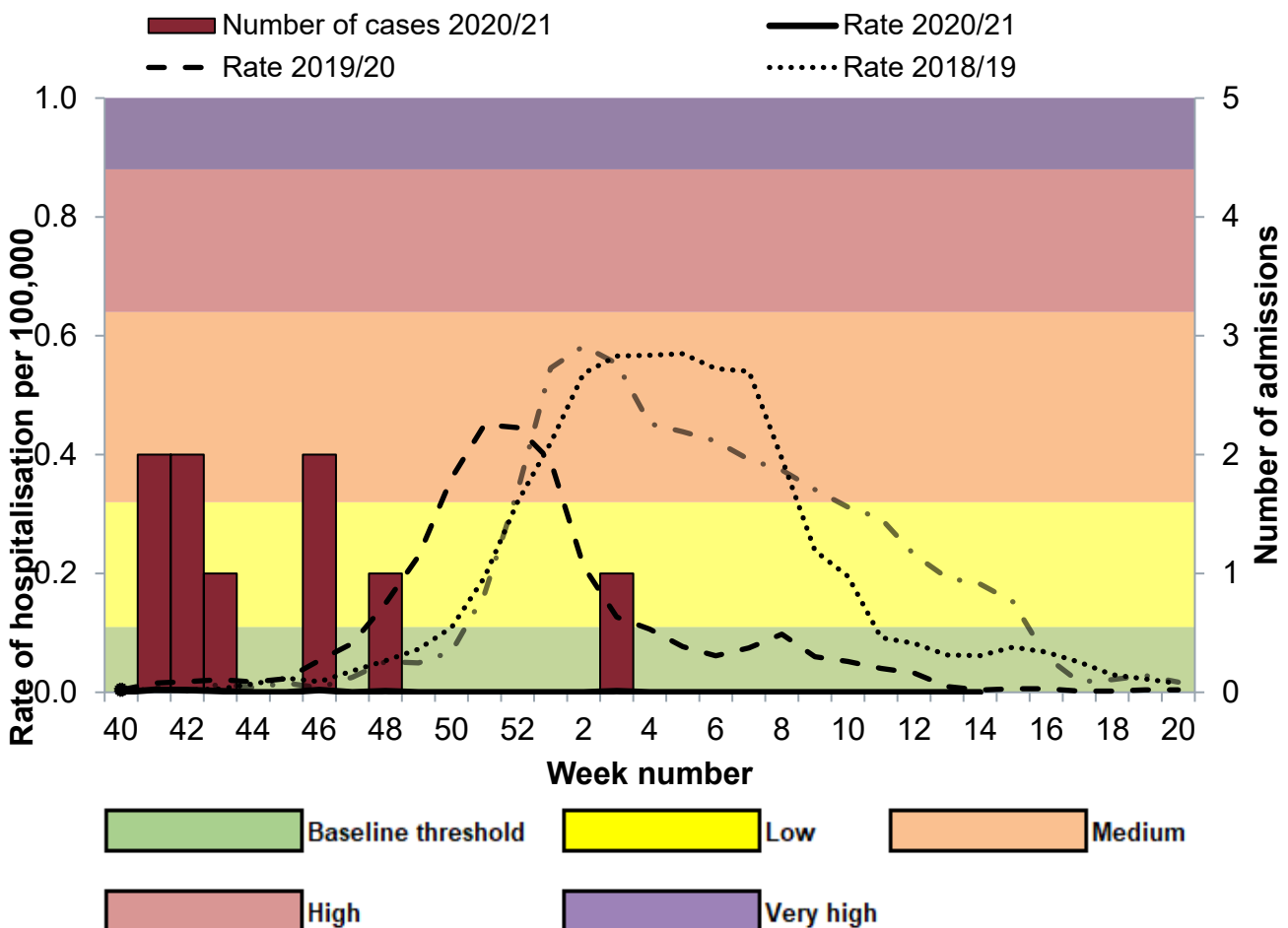
Through SARI Watch, a total of 9 ICU/HDU confirmed influenza admissions were reported from 131 NHS acute trusts across England from week 40 2020 to week 14 2021. This compares to a total of 1671 cases in 2019 to 2020, 3,017 cases in 2018 to 2019 and 3,245 cases in 2017 to 2018 (Figure 15).

ICU/HDU admission rates for confirmed influenza remained below the baseline threshold level (0.11 per 100,000 trust catchment population) for the duration of the influenza season (Figure 15).

Of the 9 influenza ICU/HDU admissions reported up to week 14 2021, all 9 were influenza A(not subtyped).

Weekly confirmed influenza ICU/HDU admission rates in England since winter 2011 are shown in Figure 16.

Figure 15. Weekly overall number of influenza ICU/HDU admissions and influenza ICU/HDU admission rates per 100,000 trust catchment population with MEM thresholds, SARI Watch, England

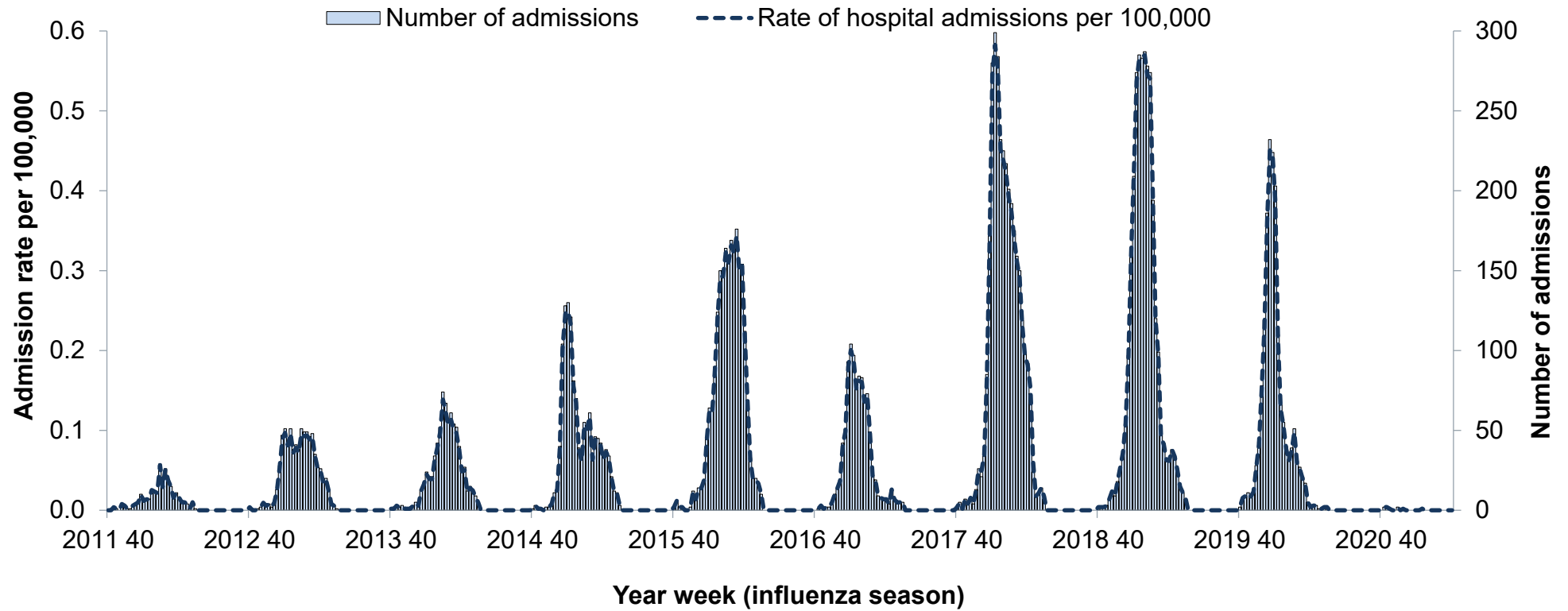


There were no confirmed influenza admissions to ICU/HDU in Scotland between week 20 2020 and week 14 2021.

Between week 40 2020 and week 14 2021 there was one influenza admission to ICU/HDU in Wales, which occurred in week 52 and tested positive for influenza B.

Between week 40 2020 and week 14 2021 there was one influenza admission to ICU/HDU in Northern Ireland, which was in week 46 and was an influenza A (not subtyped).

Figure 16. Weekly number of confirmed influenza ICU/HDU admissions with crude ICU/HDU admission rate for all ages, 2011 to 2021, England



ECMO admissions

PHE collects data on every patient admitted to a severe respiratory failure (SRF) centre, for extra corporeal membrane oxygenation (ECMO) or other advanced respiratory support, whether or not the primary cause is known to be infection-related. There are 6 SRF centres in the UK (5 in England and 1 in Scotland) participating in PHE's ECMO surveillance module.

For the 2020 to 2021 season there were no laboratory confirmed influenza admissions to SRF centres in the UK from week 40 2020 to week 14 2021.

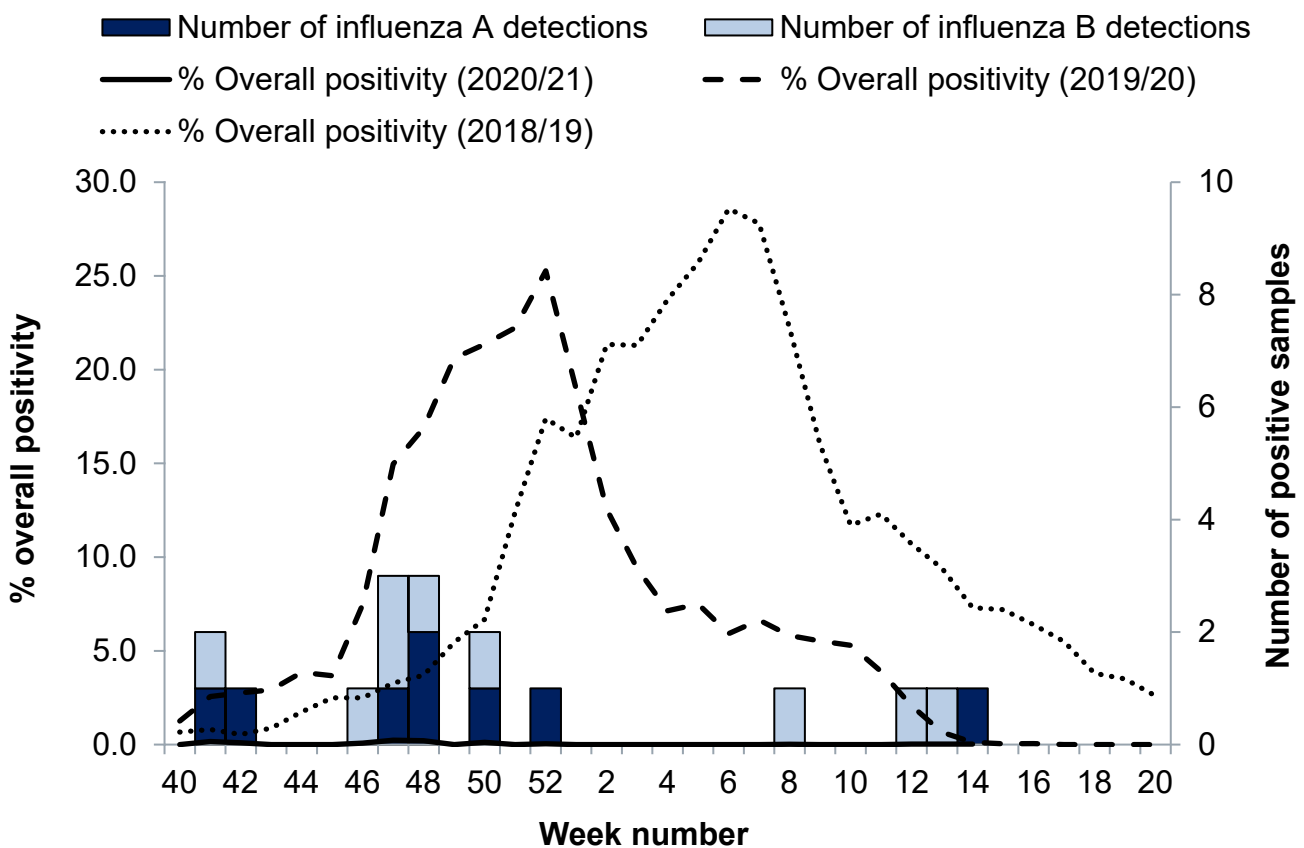
Microbiological Surveillance

Influenza

The Respiratory Datamart system was initiated during the 2009 influenza pandemic to collate all laboratory testing information in England. It is now used as a sentinel laboratory surveillance tool, monitoring all major respiratory viruses in England. 16 laboratories in England reported data for this season.

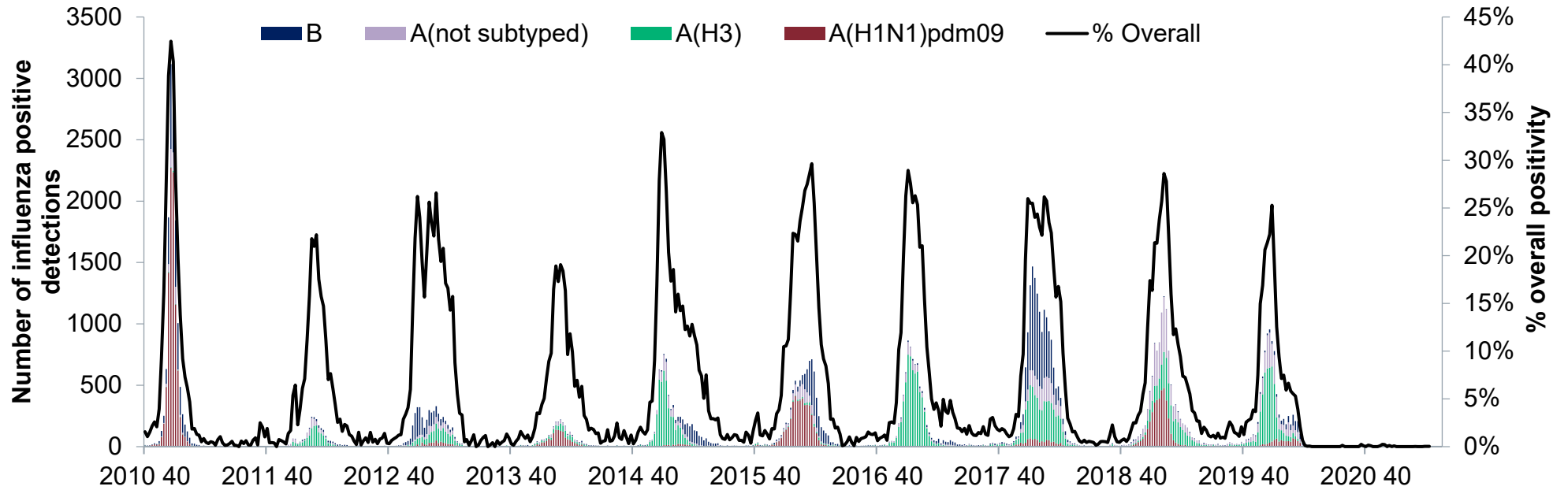
Overall influenza positivity remained extremely low for the duration of the season, with sporadic detections of both influenza A and B, never reaching more than 0.2% of samples tested. This compares to peak positivity of 25.3% in 2019 to 2020 and 28.6% in 2018 to 2019 (Figure 17).

Figure 17. Weekly number of influenza A and B detections through Respiratory Datamart in England, with overall % positivity, 2020 to 2021



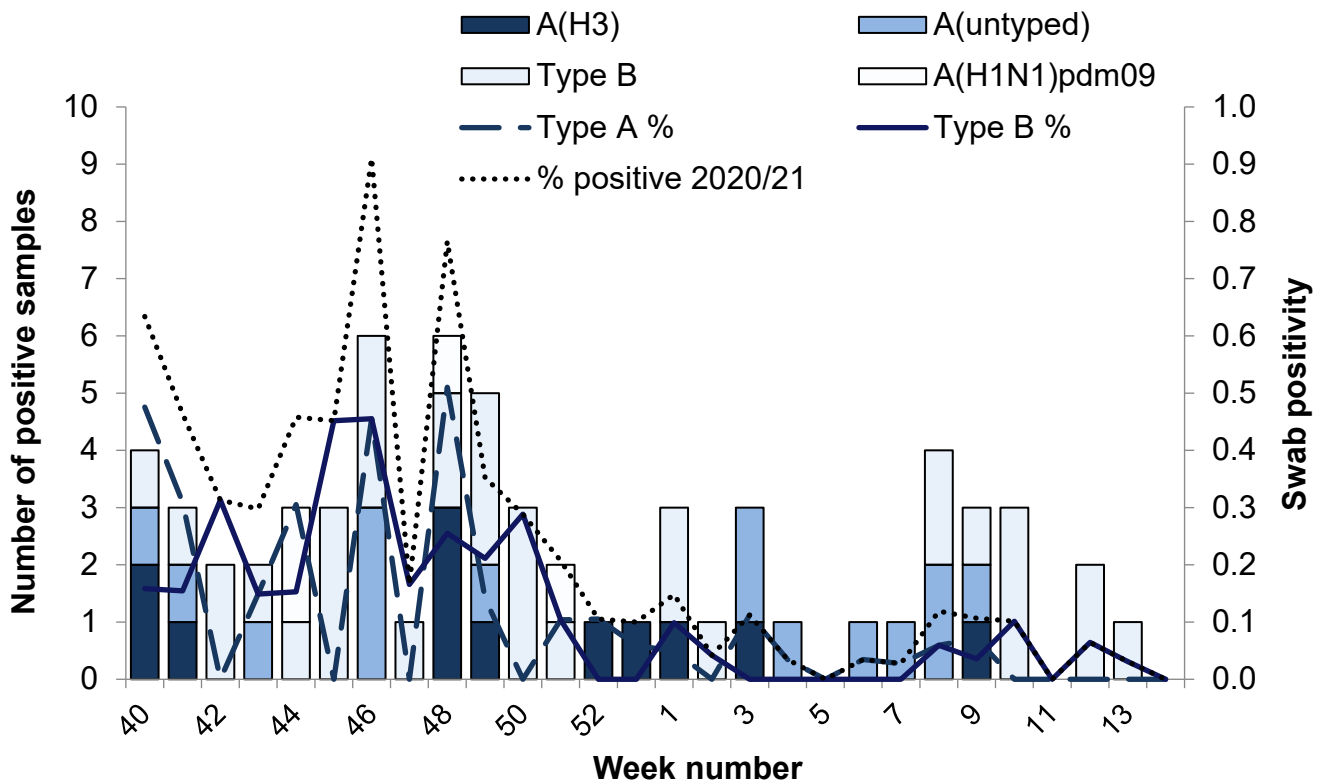
The weekly count of confirmed cases by each major type or subtype of influenza in DataMart surveillance from winter 2010 onwards is shown in figure 18.

Figure 18. Weekly number of influenza detections by subtype through Respiratory Datamart in England, with overall % positivity, 2010 to 2021



In Scotland, overall influenza positivity is reported through non-sentinel sources via Electronic Communication of Surveillance in Scotland (ECOSS). There have been low numbers of influenza diagnoses recorded to date this season (Figure 19).

Figure 19. Weekly ECOSS influenza positivity (number and percentage positive) by influenza subtype from week 40, 2020 to week 14, 2021, Scotland



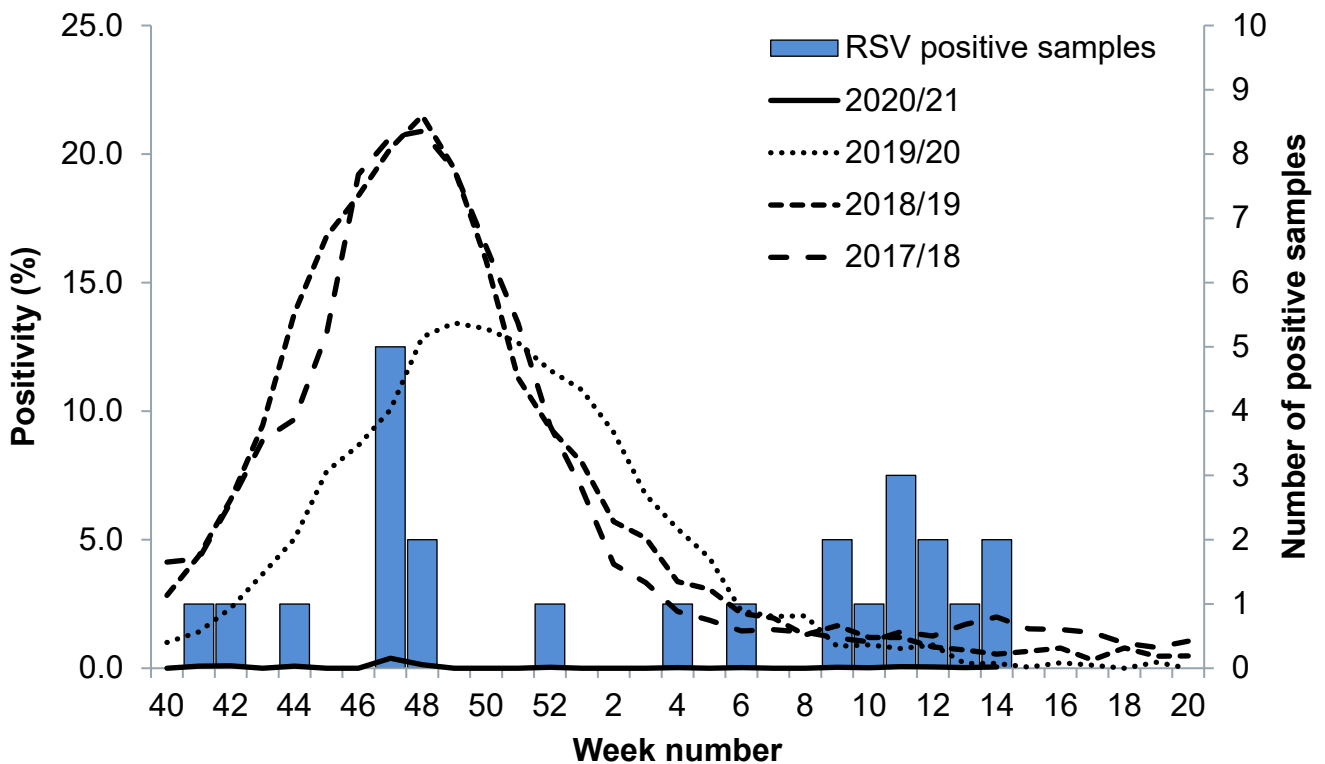
Co-infections of influenza and SARS-CoV-2

Between week 40 2020 and week 14 2021, 3 co-infections of influenza A and SARS-CoV-2 and 7 co-infections of influenza B and SARS-CoV-2 were identified in England via the Respiratory DataMart and SGSS systems. Co-infection is defined as a patient with a sample testing positive for influenza and another sample testing positive for SARS-CoV-2 within a day of each other.

Respiratory syncytial virus (RSV)

Respiratory syncytial virus (RSV) reported through the DataMart surveillance system remained extremely low for the duration of the season, with positivity never exceeding 0.4%. This compares with positivity peaks of 13.4% in 2019 to 2020, 21.5% in 2018 to 2019 and 20.9% in 2017 to 2018 (Figure 20).

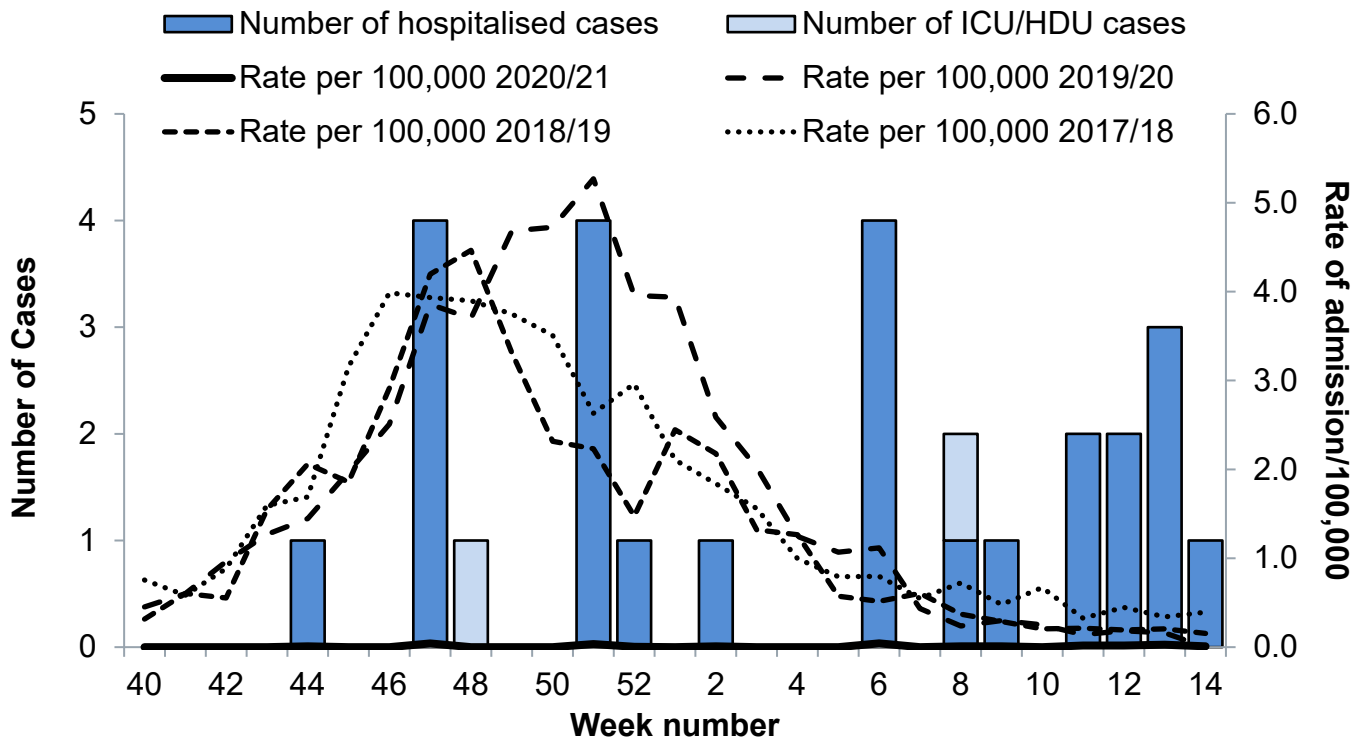
Figure 20. Weekly number of RSV detection through Respiratory DataMart in England, with overall % positivity, 2020 to 2021



England collates data on confirmed hospitalised RSV cases through the SARI Watch surveillance system. For RSV, this is a sentinel surveillance system.

Between week 40 2020 and week 14 2021, a total of 27 confirmed RSV cases (25 hospitalised to lower level of care and 2 admitted to ICU/HDU) were reported from 50 participating trusts. The rate of hospital admission (lower level of care) did not exceed 0.04 per 100,000 trust catchment population in any week. This compares to peak weekly admission rates of 5.27 per 100,000 in 2019 to 2020, 4.46 per 100,000 in 2018 to 2019 and 3.99 per 100,000 in 2017 to 2018 (Figure 21).

Figure 21. Weekly hospitalised RSV case rate per 100,00 trust catchment population, England, week 40, 2020 to week 14, 2021



In Scotland, RSV was the least commonly detected non-influenza respiratory pathogen (25 detections, estimated 0.05% positive samples) detected through non-sentinel sources (ECOSS) for the 2020 to 2021 season (up to week 14, 2021).

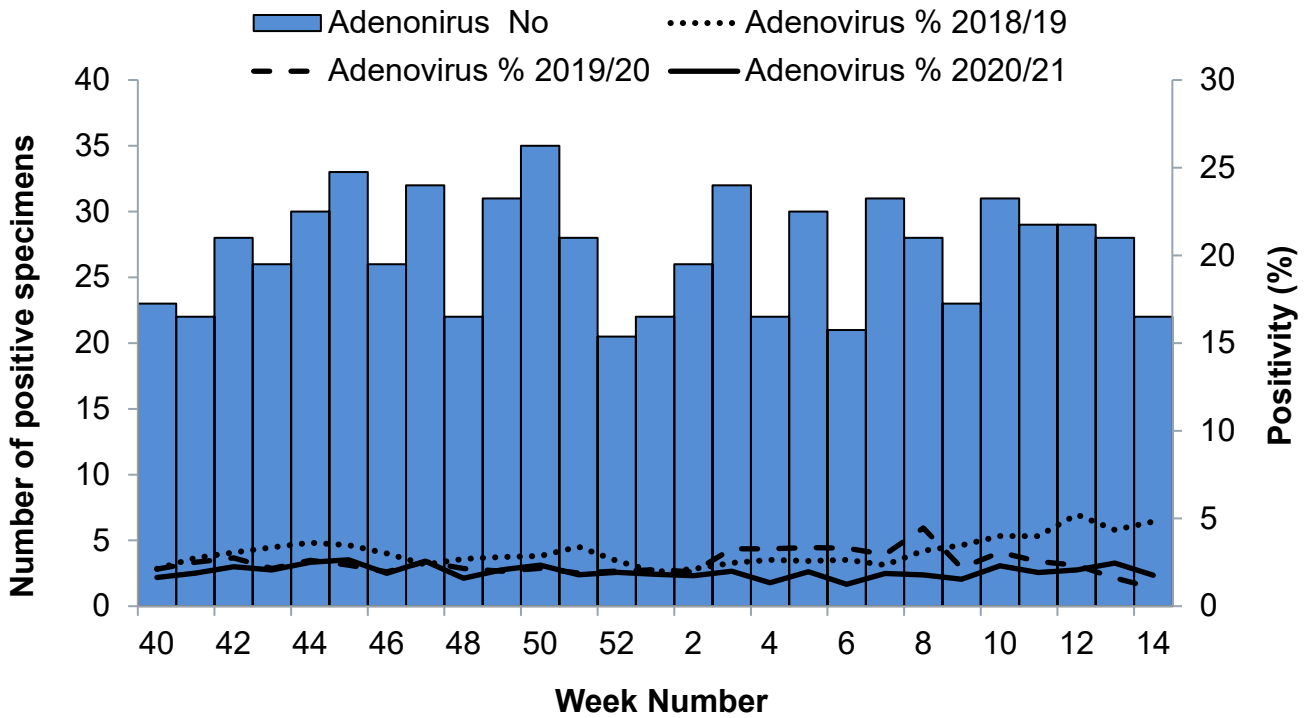
Other seasonal respiratory viruses

Of the other respiratory viruses monitored through the respiratory DataMart system, the highest activity was seen with rhinovirus throughout the season. Rhinovirus activity was highest at the beginning of the season and was at a similar level to the 2019 to 2020 and 2018 to 2019 seasons. Rhinovirus activity decreased as the season progressed, and from week 2 onwards activity was lower than that seen at the same time in the previous 2 seasons as schools remained closed for the majority of students during the national lockdown. Rhinovirus activity began to increase again in week 11 in line with school re-openings, although activity continued to remain lower than that seen at the same time in the 2018 to 2019 season (Figure 22).

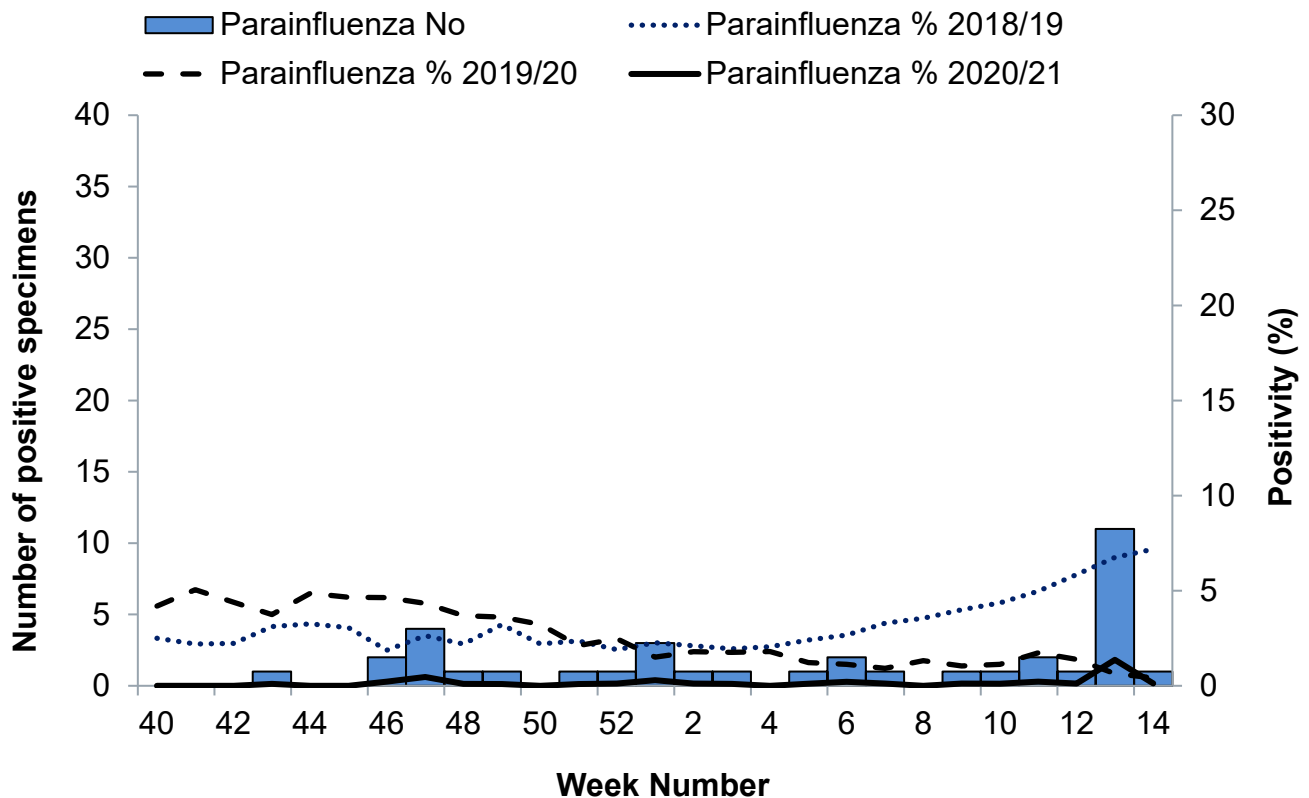
Consistent with previous seasons, low levels of adenovirus were observed throughout the season with no clear seasonality seen. Parainfluenza activity remained much lower than activity seen in previous seasons, with no more than 11 positive samples seen in any week. Human metapneumovirus (hMPV) activity remained much lower than activity seen in previous seasons, with no more than 8 positive samples seen in any week (Figure 22).

Figure 22. Weekly number of positive samples and proportion positive for other respiratory viruses, 2018 to 2020

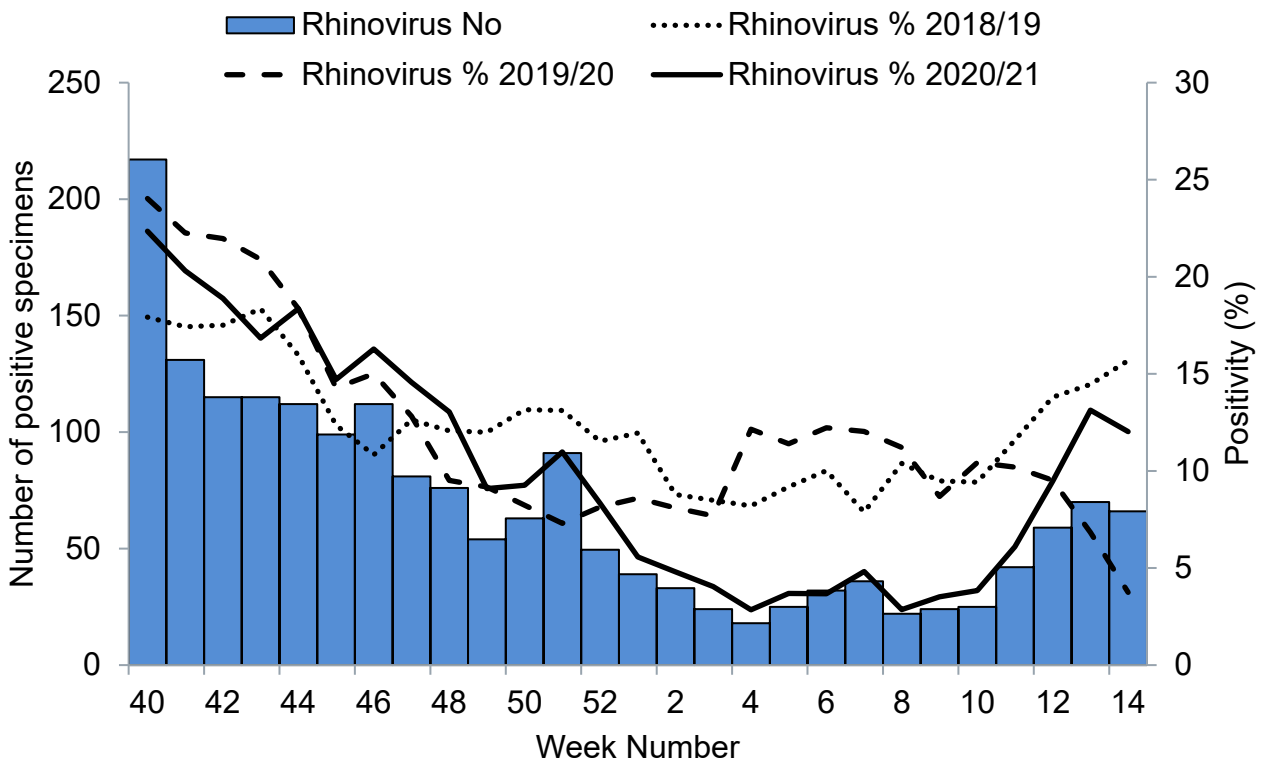
(a) Adenovirus



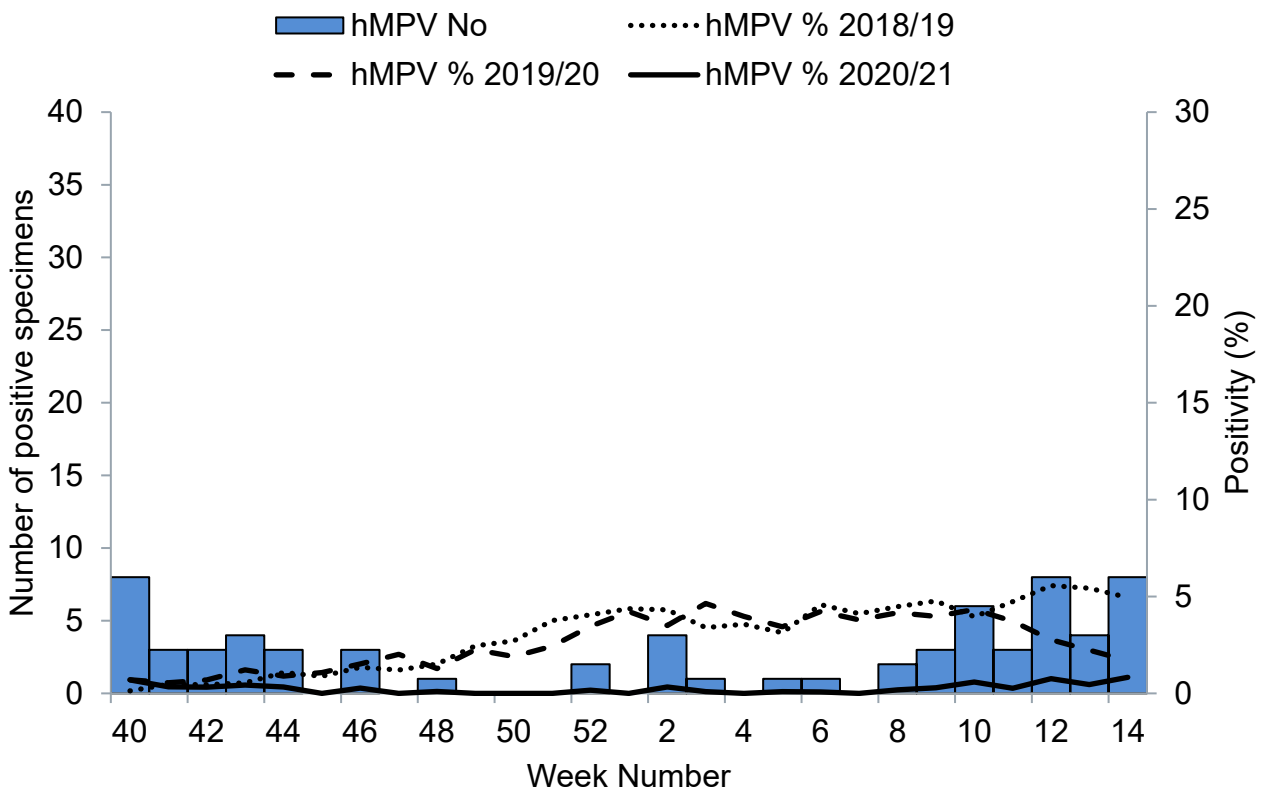
(b) Parainfluenza



(c) Rhinovirus



(d) Human Metapneumovirus (hMPV)



In Scotland, the pattern of non-influenza respiratory pathogens detected through ECOSS for the 2020 to 2021 season (up to week 14, 2021), was not similar to that seen in the previous 2 seasons (2019 to 2020 and 2020 to 2021). Rhinovirus was the most commonly detected non-influenza respiratory pathogen (2,559 detections, estimated 4.8% positive samples) Adenovirus was the second most common non-influenza pathogen (526 detections, 1.00% positive samples), followed by hMPV (87 detections, estimated 0.16% positive samples) and seasonal coronavirus (excluding SARS-CoV-2) (85 detections, estimated 0.16% positive samples), with the remaining non-influenza winter pathogen parainfluenza being detected in a lower proportion of positive samples (67 detections, estimated 0.13%). *Mycoplasma pneumoniae* was the lowest detected non-viral pathogen (6 detections, estimated 0.01%).

In Wales, 28,372 hospital and non-sentinel GP samples were routinely tested for influenza, RSV, adenovirus, *Mycoplasma pneumoniae*, rhinovirus, parainfluenza, enterovirus hMPV and SARS-CoV-2. An additional 98,071 samples were tested only for influenza, RSV and SARS-CoV-2. The 2 most commonly detected non-influenza respiratory pathogens were SARS-CoV-2 (10,756 out of 126,443 detections, 8.5% positive samples) and rhinovirus (1,953 out of 28,372 detections, 6.9% positive samples). Other detected causes of respiratory infection included: adenovirus (1.4%), enterovirus (0.2%), seasonal coronaviruses (0.2%) and human metapneumovirus and parainfluenza (0.1%).

Vaccination

Seasonal influenza vaccine uptake in adults

Although all countries of the UK use standardised specifications to extract uptake data from IT information systems in primary care, there are some differences in extraction specifications, so comparisons should be made cautiously.

In England, the uptake of seasonal influenza vaccine is monitored by PHE throughout the season based upon weekly and monthly extracts from GP information systems via ImmForm (12) for the cohorts primarily delivered via the GP practice.

Cumulative uptake on influenza vaccinations administered up to 29 February 2021 was reported from 97.6% (6,438 out of 6,596) of GP practices in England in 2020 to 2021. Comparative data are up to 28 February 2020 where uptake was reported from 99.3% (6,678 out of 6,723) of GP practices in England in 2019 to 2020. This season saw a vaccine uptake of 80.9% in those 65 and over (compared to 72.4% in 2019 to 2020) and 53.0% for those aged 6 months to under 65 years of age with 1 or more underlying clinical risk factors (excluding pregnant women without other risk factors and carers), compared to 44.9% in 2019 to 2020 (Table 1). Uptake in pregnant women was 43.6%, compared to 43.7% in 2019 to 2020. In the 2020 to 2021 season, the programme was extended to include all 50 to 64 year olds not at risk (dependent on supply). Uptake in this group was 35.2%. The more detailed final uptake reports are now publicly available (13).

In Scotland, the uptake of seasonal influenza vaccine is estimated by PHS throughout the season, based on automated 4-weekly extracts from >95% of all Scottish GP practices and templates submitted by staff in all the territorial and special NHS boards. At this time, the vaccine uptake data reported should be regarded as provisional but they do indicate that the overall vaccine uptake for Scotland is higher than last season in most eligible cohorts although the data are not directly comparable. Cumulative uptake to week 15, 2021 for the 2020 to 2021 season indicates that for those aged 65 years and over the uptake is 79.6% compared to 74% in the previous 2 seasons. Uptake amongst those under 65 years in one or more clinical at-risk groups was 55.9% compared to 42% in the previous 2 seasons. Overall uptake in pregnant women (including those with and without other risk factors) up to week 15, 2020 was 53.3%, compared to 44% and 46%, respectively in previous 2 seasons (2019 to 2020 and 2018 to 2019) (1).

In Wales, the uptake of seasonal influenza vaccine is monitored on a weekly basis by Public Health Wales throughout the season and is based on automated weekly extracts of Read coded data using software installed in all General Practices in Wales, collected through the Audit+ Data Quality System. Cumulative uptake data on influenza vaccinations administered were received from 100% of GP practices in Wales in 2020 to 2021. This

showed a vaccine uptake of 76.5% in 65 year olds and over (compared to 69.4% in 2019 to 2020) and 51.0% for those aged 6 months to under 65 years of age with 1 or more underlying clinical risk factors, compared to 44.1% in 2019 to 2020. Uptake in all patients aged 50 to 64 years old was 37.4%. Overall uptake in pregnant women was 81.5% compared to 78.5% in 2019 to 2020. In Wales, vaccine coverage in pregnant women is measured differently using a survey of pregnant women giving birth each year during January. In addition, as elsewhere in the UK, data are also automatically collected from general practices for women with pregnancy related Read codes. These data report uptakes of 60.2% in pregnant women at risk and 43.9% in healthy pregnant women.

In Northern Ireland, the uptake of seasonal influenza vaccine is monitored by the Public Health Agency (PHA) of Northern Ireland. Cumulative uptake of influenza vaccination administered up to 31 March 2021 was reported from 99.7% of GP practices in Northern Ireland in 2020 to 2021. In the population aged 65 and over uptake was 79.1% (compared to 74.8% in 2019 to 2020) and in the population of under 65 years at risk the uptake was 67.8% (compared to 58.9% in 2019 to 2020). Uptake in pregnant women was 42.1% compared to 46.3% in 2019 to 2020. In Northern Ireland, 2020 to 2021 was the first year of roll out in the 50 to 64 year old age group, when 21,931 vaccinations were administered (denominator and uptake values not yet available).

Uptake by frontline healthcare workers in England was 76.8% from 98.5% of organisations, an increase from 74.3% in 2019 to 2020. In Scotland, provisional uptake figures in health and social care workers across all territorial and special NHS boards was 41.5%, however this is not comparable with previous years as social care staff from the public and private sector were offered flu vaccine for the first time during the 2020 to 2021 season. In Wales, uptake reached 65.6% compared to 58.9% in 2019 to 2020. In Northern Ireland, uptake in frontline healthcare workers including social care was 49.8% compared to 36.8% in 2019 to 2020. Uptake for healthcare workers excluding social care workers was 52.4% in 2020 to 2021.

Table 1. Vaccine uptake in adults in the UK***a) England**

Target group		Number vaccinated	Denominator	% uptake
65 and over		8,449,159	10,448,410	80.9
6 months to under 65 years at risk		4,293,412	8,098,035	53.0
Pregnant	No risk	219,741	529,489	41.5
	At risk**	44,487	77,051	57.7
	All	264,228	606,540	43.6
Healthcare Workers***		869,061	1,131,683	76.8

b) Scotland

Target groups		Number vaccinated	Denominator	% uptake
65 and over		859,978	1,079,921	79.6
6 months to under 65 years at risk		423,628	757,926	55.9
Pregnant	No risk	-	-	-
	At risk**	-	-	-
	All	19,287	36,181	53.3
Healthcare Workers***		125,406	302,032	41.5

c) Wales

Target group		Number vaccinated	Denominator	% uptake
65 and over		521,082	681,255	76.5
6 months to under 65 years at risk		226,590	444,330	51.0
Pregnant	No risk	8,472	19,298	43.9
	At risk**	1,533	2,546	60.2
	All****	300	368	81.5
Healthcare Workers***		41,505	63,266	65.6

d) Northern Ireland

Target group		Number vaccinated	Denominator	% uptake
65 and over		262,919	332,563	79.1
6 months to under 65 years at risk		187,116	276,113	67.8
Pregnant	No risk	-	-	-
	At risk**	-	-	-
	All	8,487	20,140	42.1
Healthcare Workers***		20,733	39,567	52.4

*Data for Scotland are provisional

**The pregnant women at-risk are included in the under-65 years at risk category

***Excludes social care workers for England, Northern Ireland and Wales. Includes social care workers for Scotland.

****For Wales all pregnant woman is taken from the annual point of delivery survey. The 2020 to 2021 survey was based on a sample of 368 women delivering over a 5-day period in January 2021.

Influenza vaccine (LAIV) programme for children

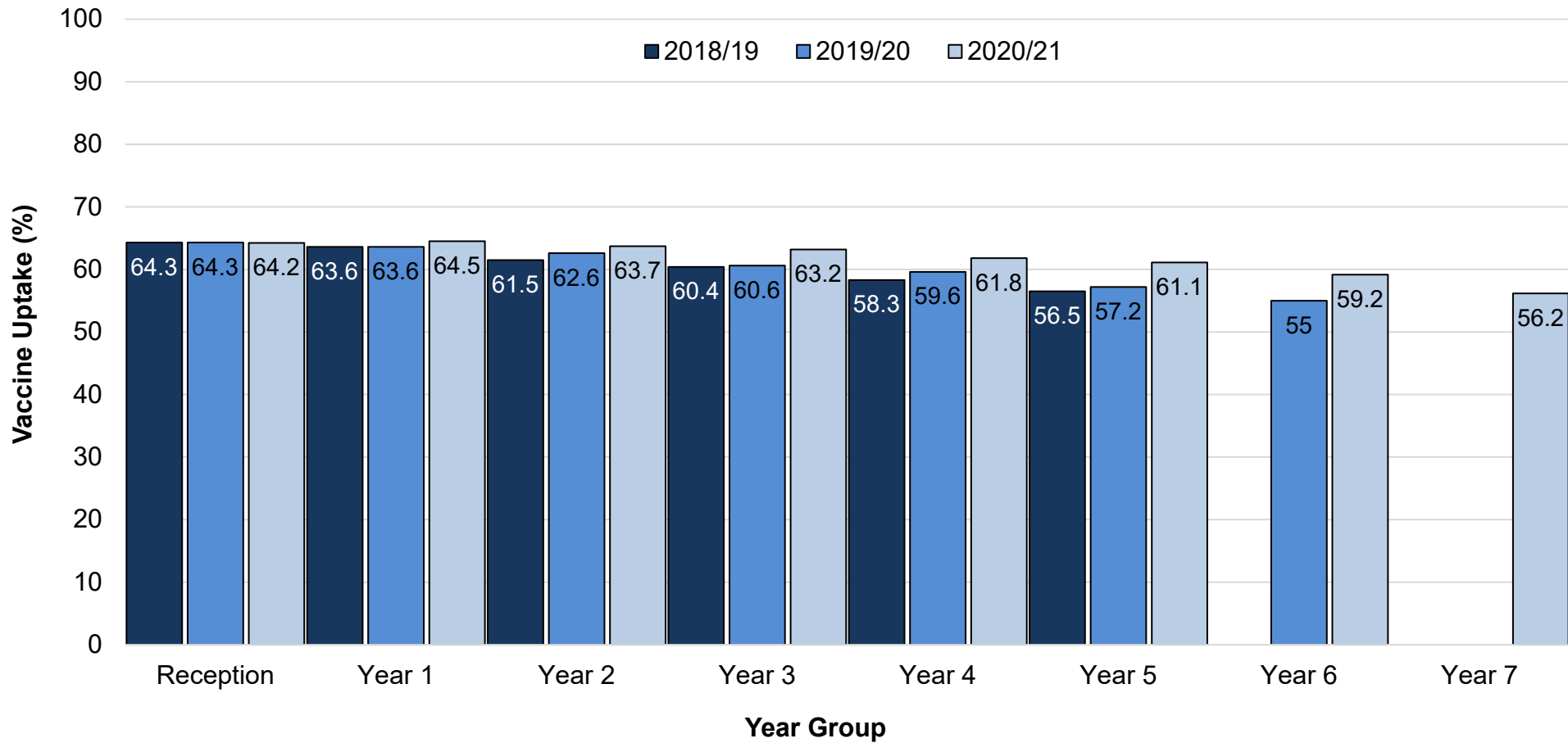
England

The influenza vaccine uptake in 2 and 3 year olds in England is monitored by PHE throughout the season, through weekly and monthly extracts from GP information systems via ImmForm. Cumulative uptake on influenza vaccinations administered up to 29 February 2021 was reported from 97.2% (6,406 out of 6,592) of GP practices in England in 2020 to 2021. Comparative data are up to 28 February 2020 where uptake was reported from 99.3% (6,673 out of 6,720) of GP practices in England in 2019 to 2020. This season saw a vaccine uptake for all GP-registered 2 year olds of 55.3% (compared to 43.4% in 2019 to 2020) and was 58% in 3 year olds (compared to 44.2% in 2019 to 2020) in England. The combined uptake for 2 and 3 year olds was 56.7% compared to 43.8% in 2019 to 2020.

In the 2020 to 2021 season, the influenza vaccine programme for primary school children was extended to include children in Year 7 (age 11 rising to 12 years). The programme was mainly delivered via a school-based route, although one area (Isle of Scilly) delivered vaccinations through general practice. Vaccine uptake was monitored through manual returns by local teams for their responsible population.

An estimated 3,342,578 children in school years Reception, 1, 2, 3, 4, 5, 6 and 7 in England received at least 1 dose of influenza vaccine during the period 1 September 2020 to 31 January 2021. With an estimated total target population of 5,416,670; the overall uptake was 61.7%. Total uptake in children in Reception and school years 1, 2, 3, 4, 5, 6 and 7 was 64.2%, 64.5%, 63.7%, 63.2%, 61.8%, 61.1%, 59.2% and 56.2%, respectively. This overall pattern of decreasing uptake with increasing age was also seen in the 3 previous years. Uptake in years 1 to 6 was higher than seen in the 2019 to 2020 season (Figure 23).

Figure 23. Influenza vaccine uptake (%) for children in school years Reception, 1, 2, 3, 4, 5, 6 and 7 by year group, collected between 1 September 2020 to 31 January 2021



Overall uptake for children in school years' Reception, 1, 2, 3, 4, 5, 6 and 7 combined by Local Authority (LA) (not shown here) ranged from 34.4% (9,605 out of 27,908) in Tower Hamlets to 80.5% (12,988 out of 16,143) in West Berkshire. Uptake by year group and LA ranged from:

- 37.1% to 83% in Reception
- 37.2% to 83.6% in Year 1
- 37% to 83.7% in Year 2
- 35.9% to 83.1% in Year 3
- 35.2% to 80.3% in Year 4
- 32.3% to 81.4% in Year 5
- 30.5% to 78.7% in Year 6
- 21.3% to 87.6% in Year 7

Scotland

In Scotland, the estimated uptake in pre-school children (2 to under 5 year olds, not yet in school) vaccinated in the GP setting was 63.0%, compares to 52.5% and 55.8% in 2019 to 2020 and 2018 to 2019, respectively.

The influenza vaccine programme in primary school aged children in Scotland continues with an estimated uptake of 75.5% in 2020 to 2021; compared to 71.3% and 72.9% uptake in 2019 to 2020 and 2018 to 2019, respectively.

Wales

In Wales, immunisations for 2 and 3 year olds were delivered through general practices, apart from one health board where the majority of 3 year olds were immunised through nursery school immunisations sessions (uptake in these nursery school sessions was 53.1%). National uptake of influenza vaccine in 2 and 3 year olds increased in 2020 to 2021. Uptake of influenza vaccine for children aged 2 years was 54.7% (compared to 49.3% in 2019 to 2020), for 3 year olds it was 57.8% (compared to 52.1% in 2019 to 2020). For the whole group of children aged 2 and 3 years, uptake was 56.3% (compared to 50.7% in 2019 to 2020).

The childhood influenza programme in Wales includes all primary school children. Children aged 4, 5, 6, 7, 8, 9 and 10 years, received their vaccinations in school immunisation sessions and uptake was 72.5%, 75.2%, 72.3%, 73.2%, 72.2%, 70.7% and 71.2% in each of these groups respectively. For the group as a whole, uptake was 72.4% (compared to 69.9% in 2019 to 2020).

Northern Ireland

In 2020 to 2021 the childhood influenza vaccination programme continued to include all pre-school children aged 2 to 4 years old and all primary school aged children. The former

group were offered vaccination through primary care, with the latter group offered vaccination through school health teams. The vaccination uptake rate in 2020 to 2021 for pre-school children aged 2 to 4 years old was 55.2% (compared to 48.5% in 2019 to 2020). The vaccination uptake rate for children in primary school (aged approximately 4 to 11 years old) was 73.2% (compared to 75.4% in 2019 to 2020). In 2020 to 2021, Northern Ireland rolled out its first nasal vaccination programme for all year 8 children (11 to 12 year olds) with an uptake rate of 66.6%. This year group was vaccinated through school clinics.

Emerging respiratory viruses

Middle East Respiratory Syndrome coronavirus (MERS-CoV) infections

Since WHO first reported cases of Middle East Respiratory Syndrome Coronavirus (MERS-CoV) in September 2012, a total of 2,574 laboratory confirmed cases have been reported globally up to the end of March 2021. This includes 885 fatal cases (case fatality ratio of 34.4%) (14). Most cases have either occurred in the Middle East or have direct links to a primary case infected in the Middle East. A feature of MERS-CoV, is its ability to cause large outbreaks within healthcare settings. Local secondary transmission following importation has been reported from several countries including the UK, France, Tunisia and the Republic of Korea.

MERS-CoV infection was originally confirmed in 4 cases with 2 imported cases to the UK detected in September 2012 and January 2013, respectively. The 2 secondary cases with non-sustained transmission in the UK were linked to the second imported UK case in January 2013.

PHE continues to monitor potential cases in travellers returning from the Middle East with severe respiratory disease, with individuals tested for MERS-CoV if they meet the suspect case definition. One positive case has been reported in the UK since February 2013; the imported case was confirmed to have MERS-CoV infection in August 2018 (15). No onward transmission was detected amongst their close contacts. This brings the total number of positive cases seen in the UK to 5. However, in April and May 2014, 2 laboratory confirmed cases transited through London Heathrow Airport on separate flights to the USA. Contact tracing of flight contacts did not identify any further cases.

PHE remains vigilant, closely monitoring developments in countries where new cases emerge and continues to liaise with international colleagues to assess whether recommendations need to change in relation to MERS-CoV. The risk of infection to UK residents in the UK remains very low, although the risk of infection to UK residents in the affected areas is slightly higher, but is still considered to be low. There does remain a risk of imported cases from affected countries; however, this risk remains low (16). For further PHE information on management and guidance of possible cases, please see information online (17).

Human influenza A(H7N9) infections

Since the first 3 human infections with avian influenza A(H7N9) were reported in China through WHO in April 2013 (18), up to 7 April 2021, 1,568 cases have been reported, including at least 616 deaths giving an overall case fatality ratio of 39.2% (19).

For further updates, please see the WHO website (20) and for PHE advice on clinical management, please see information available online (21).

Human influenza A(H5N1), influenza A(H5N6) and influenza A(H5N8) infections

Since 2003, 861 cases of avian influenza A(H5N1) have been reported including 455 deaths, giving an overall case fatality rate of 52.8%. Cases have been reported from 17 countries (22). In addition, 3 human cases of A(H5) infection were reported from Nigeria in March 2021 among persons exposed to Influenza A(H5N1) in avian species.

As of 24 March 2021, a total of 31 human influenza A(H5N6) cases have been reported since February 2014 (22). The most recent cases were reported from China and Lao People's Democratic Republic.

In February 2021, the WHO reported 7 human cases of influenza A(H5N8) from the Russian Federation. This is the first time human infection of influenza A(H5N8) has been reported (23).

Most human cases of avian influenza were exposed to H5 and H7 viruses through contact with infected poultry or contaminated environments, including live poultry markets. Since the viruses continue to be detected in animals and environments, further human cases can be expected. Even though small clusters of H5N1 and H7N9 virus infections have been reported including those involving healthcare workers, current epidemiological and virological evidence suggests that these viruses have not acquired the ability to undergo sustained transmission amongst humans. It is important to ensure that imported cases of suspect avian influenza are detected promptly to ensure public health measures including infection control can be rapidly put in place to minimise any risk of onward transmission.

Conclusions

Influenza activity remained at extremely low levels across the UK for the duration of the 2020 to 2021 influenza season. Influenza-like illness consultation rates remained far below the baseline and much lower than levels seen in previous seasons across the UK, with rates also lower than even those observed in the inter-seasonal periods in many previous years. Secondary care admissions for confirmed influenza also remained well below baseline levels and at much lower levels than those seen in previous seasons. Only sporadic detections of influenza were observed through Respiratory DataMart. These extremely low levels of influenza activity were also seen in other parts of the Northern Hemisphere in the 2020 to 2021 season, including across Europe (24), Canada (25) and US (26).

The low influenza activity levels seen in the 2020 to 2021 season are likely due to the measures put in place to control the COVID-19 pandemic. These measures include public health messaging, increased hand hygiene, social and physical distancing measures, the wearing of face coverings, school closures, national lockdowns, local area restrictions and restrictions on international travel. Decreases in influenza activity following the implementation of COVID-19 restriction measures have been noted across many countries in both the Northern and Southern hemispheres (27 to 31).

Influenza vaccine uptake in 2020 to 2021 varied across the UK. In England, the uptake rates were higher than the previous season in all target groups, with the exception of pregnant women which were comparable to the previous season. In Scotland and Wales, the uptake was higher than the previous season in almost all target groups. In Northern Ireland, uptake in eligible cohorts was higher than the previous season with the exception of pregnant women. The 2020 to 2021 influenza season also saw the rollout of the vaccination programme to 50 to 64 year olds across the UK nations, dependent on vaccine supply.

The roll out and expansion of the childhood LAIV programme which was first implemented in the 2013 to 2014 season, continued across the UK. The programme targeted eligible preschool cohorts and all children in primary school in the UK, and children in the first year of secondary school in England and Northern Ireland. Increases in uptake were seen both in younger children receiving their vaccine in primary care and in the school aged cohorts across the UK.

Activity of other respiratory viruses varied. RSV, parainfluenza and hMPV activity was much lower than in previous seasons. Adenovirus activity remained at a similar level to previous seasons. Rhinovirus activity was highest at the beginning of the season and was at a similar level to that seen in previous seasons, before decreasing to low levels from January to March, and then increasing again towards the end of the season.

Surveillance continues in the UK for novel respiratory viruses, including MERS-CoV and avian influenza viruses such as influenza A(H7N9), influenza A(H5N1) and influenza A(H5N6), with risk assessments being updated regularly.

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