



Seasonal influenza in Wales 2022/23

Annual Report

Summary

The season

The 2022/23 influenza season in Wales saw a mixed pattern of severity across different surveillance indicators. There were fewer cases in the community diagnosed with influenza-like illnesses (ILI) by general practices than any season since 2015 and the season appeared shorter than average based on weekly sentinel GP ILI consultation rates. There were however, higher numbers of patients confirmed with influenza in hospitals than in any recent winter, although this in part may reflect higher levels of testing. The winter also saw significant excesses in seasonal mortality, coinciding with the peak of influenza activity, from week 50 2022 to week 1 2023. The number of outbreaks of acute respiratory infection and influenza-like-illness reported to Public Health Wales, although lower than previously in the COVID-19 pandemic, remained high and the majority were due to COVID-19. Similar to previous years, the majority of outbreaks were in care homes.

Surveillance indicators of circulation in the community began to increase from mid-December and by week 49 had exceeded the threshold to indicate seasonally expected levels of influenza circulation. The weekly sentinel GP consultation rate for patients with influenza-like illness (ILI) symptoms peaked two weeks later at medium intensity levels. In total, the sentinel GP ILI consultation rate was above the threshold for seasonal activity for six weeks, including four weeks at medium intensity. Surveillance indicators of influenza in hospital patients first exceeded the baseline threshold and peaked at a similar time and intensity level to surveillance indicators in the community. However, there was an extended tail to the season in hospitals, with the proportion of patients testing positive for influenza not returning to baseline levels for an additional 10 weeks. The difference in levels of influenza activity seen in hospitals compared to the community may, in part, be related to increased utilisation of rapid testing for COVID-19, influenza and RSV in hospitals this season.

There was co-circulation of influenza A(H1N1)pdm09 and influenza A(H3N2) during the 2022/23 season, with similar timings, however the proportion of cases which were accounted for by A(H3N2) was higher. Small numbers of sporadic cases of influenza B were confirmed in Wales throughout the season, before increasing towards the end of the season.

Vaccination uptake

Following the highest ever numbers of influenza vaccines being delivered in 2021/22, there was a small decline in the 2022/23 season. An estimated 1,063,495 people were vaccinated, representing 34% of the population of Wales. In those aged 65 years and older, 76.3% were vaccinated (525,902 individuals), a small decrease from last season which saw the highest ever uptake in this group. Uptake for clinical risk groups also decreased to 44.2% (200,211 individuals) this season.

The childhood influenza vaccination programme this season was fully extended to all children aged two to 15 years, 270,348 of whom received vaccination. Uptake in two and three year olds was 43.8%; was 63.8% in four to 10 year olds and 54.4% in 11-15 year olds. Coverage of influenza vaccination in pregnant women decreased to 60%, estimated in an annual point of delivery (post-natal) survey. In front-line NHS staff uptake decreased to 46.7%, after a long-term positive trend up to 2017/18.

Vaccine effectiveness

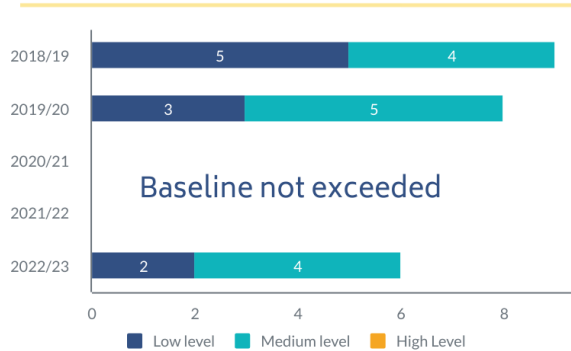
The provisional end of season estimate for effectiveness of 2022/23 seasonal influenza against laboratory confirmed influenza in those requiring hospitalisation following an emergency care attendance in England was 28% (95% CI 15% to 39%) in those aged 65 years and above, 32% (95% CI 13% to 47%) in those aged 18 to 64 years

and 65% (95% CI 52% to 75%) in two to 17 year olds. Effectiveness was estimated to be higher against influenza A(H3N2) compared to A(H1N1)pdm09 although there was greater uncertainty in A(H1N1)pdm09 estimates due to low circulation.

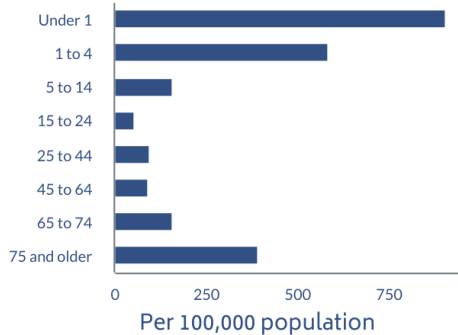
The effectiveness of QIVc vaccine in the 18 to 64 year age group against hospitalisation was 35% (95% CI 15% to 51%). In those aged two to 17 years of age effectiveness for LAIV was 64% (95% CI 49% to 75%) compared to 72% (95%CI 24% to 89%) for QIVc. The effectiveness of aQIV vaccine in the 65 years and over age group was 27% (95%CI 14 to 38%) compared to 30% (95%CI -14 to 57%) for QIVc.

INFLUENZA SEASON IN WALES 2022/23

Dominant types of influenza A(H1N1) & A(H3N2)



Age of people in hospital with influenza



708 Outbreaks of Influenza, ILI or ARI
 683 SARS-CoV2 17 Influenza A
 5 Influenza A & SARS-CoV2

94% in care homes 1% in school/nursery settings



7,763 patients diagnosed with influenza-like illness by GPs



2,332 patients confirmed with influenza in A&E

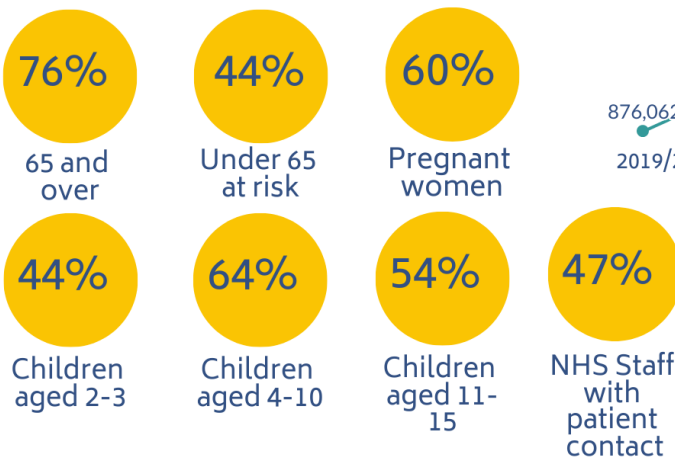


2,676 patients confirmed with influenza in hospital wards



103 patients confirmed with influenza in intensive care units

Influenza vaccine uptake



Estimated total number of individuals recorded by their general practice as immunised against influenza.



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Key Findings

- 2022/23 saw a return to more 'usual' levels of influenza activity, following a period of low activity during 2020 and 2021. The sentinel GP ILI consultation rate was above baseline levels for just six weeks, shorter than average (13.5 weeks) and peaked above the threshold for medium intensity levels for four weeks.
 - From week 40 2022 to week 15 2023, 5,107 patients were confirmed to have influenza in hospitals, 2,332 of whom were tested in accident and emergency departments and 103 of whom were in intensive care units.
 - A total of 708 outbreaks of ILI or acute respiratory illness (ARI) were reported between week 40 2022 and week 15 2023, with 94% of the outbreaks in residential homes, 1% in school/nursery settings and 5% in other settings.
 - During the influenza season all-cause mortality exceeded expected levels during 2022 week 50 through to 2023 week 01.
- Overall, influenza A(H3N2) was the dominant influenza virus, followed by influenza A(H1N1)pdm09. Smaller numbers of influenza B were also detected throughout the season.
- As at April 2023, 222 influenza A viruses had undergone genetic characterisation by whole genome sequencing (WGS), most A(H3N2) viruses sequenced in Wales fell into the 3C.2a1b clade. The 3C.2a1b viruses also maintained their genetic variability. Northern hemisphere influenza vaccines for 2022/23 were recommended to contain an A/Victoria/2570/2019 (H1N1)pdm09-like virus; and an A/Darwin/9/2021 (H3N2)-like virus.
- The provisional end of season vaccine effectiveness estimate against laboratory confirmed influenza, was 28% (95% CI 15% to 39%) in those aged 65 years and above. Estimated effectiveness of the new QIVc vaccine in the 18 to 64 age group was 35% (95% CI 15% to 51%). The overall adjusted vaccine effectiveness for LAIV in those two to 17 years of age was 64% (95% CI 49% to 75%).
- The antiviral prescribing rate peaked at 10.2 prescriptions per 100,000 practice population during week 48 2022. During the 2022/23 season in the UK, most viruses were fully susceptible and only small numbers of viruses were detected with reduced sensitivity to oseltamivir or zanamivir.
- During 2022/23 uptake of influenza vaccine in the eligible population decreased in all groups compared to last season.
 - Influenza vaccine uptake in those aged 65 years and older in Wales was 76.3% (n=525,902), a decrease compared to 78.0% (n=535,876) last season.
 - Vaccine uptake in patients aged 50-64 years of age (not in a clinical risk group) was 42.0% (n=284,258).
 - Uptake of influenza vaccine in people aged six months to 64 years in a clinical risk group was 44.2% (n=200,211), which is a decrease compared to 48.2% (n=215,332) last season.

- Uptake among clinical risk groups was highest in patients with diabetes (57.2%) and lowest in the morbidly obese (40.2%).
- Uptake of influenza vaccine in pregnant women was 60.0% (95% CI 54.6%-65.2%), (measured in an annual survey of women in major maternity units who gave birth during February 2023), a decrease from 78.5% (95% CI 74.1%-82.5%) last year and below the 90% vaccination target set by Welsh Government.
 - Uptake of influenza vaccine in people younger than 65 years and recorded as being a carer (including carers who are also in a clinical risk group) was 51.3% (n=23,967).
 - Uptake of influenza vaccine in children aged two and three years, mainly immunised in general practices, was 43.8% (n=27,433), a decrease of 3,420 compared to 2021/22.
 - Uptake of influenza vaccine in children aged four to 10 years, immunised in schools, was 63.8% (n=148,979), which is a decrease compared to 68.7% (n=167,031) in 2021/22.
 - Uptake of influenza vaccine in children aged 11 to 15 years, immunised in schools, was 54.4% (n=93,936), which is a decrease compared to 58.2% (n=101,009) in 2021/22.
 - Uptake in NHS Wales staff with direct patient contact was 46.7% (n=29,146), compared to 57.2% (n=35,399) last season. Uptake in all NHS staff was 46.0% (n=44,430) during 2022/23, a decrease compared to 55.7% (n=53,254) during 2021/22.
- The total number of individuals in Wales who were immunised against influenza was 1,063,495 for 2022/23, compared to an estimated 1,117,184 last season, based on Read codes in their general practice record. This represents 34% of the estimated total population of Wales.
 - Community pharmacies across Wales administered 160,792 influenza vaccinations through the NHS community pharmacy influenza service in 2022/23, a slight decrease from 166,455 in 2021/22

1. Background

1.1 Influenza and influenza-like illness surveillance indicators

Public Health Wales monitors and reports on influenza activity in Wales throughout the year using a number of indicators. Historically, the main indicator of influenza activity in Wales and in other UK countries has been the weekly rate of consultations in general practices for influenza-like illness (ILI), per 100,000 practice population. The general practice (GP) consultation rate for ILI in Wales is calculated using data provided from a network of sentinel practices, through Audit+ GP software. The sentinel GP network in Wales has provided data used for monitoring influenza activity since 1986, firstly using a paper based system and since 2009 using Audit+, an automated computer based data collection tool. The threshold at which the sentinel GP ILI consultation rate suggests that the influenza season has started is calculated using the Moving Epidemic Method (MEM). This method also produces thresholds to indicate medium, high and very high intensities of activity. In Wales, all influenza seasons from 2010/11 onwards are used to provide a historical comparison for MEM analysis. Due to unusual activity during the COVID-19 pandemic, 2020/21 and 2021/22 season data was not included in the calculation for 2022/23 MEM thresholds.

More recently, a range of indicators from both primary and secondary care have been used in order to provide a wider picture of the burden of influenza and other seasonal respiratory illnesses. These indicators have also been used to monitor activity throughout the COVID-19 pandemic. During 2022/23, the following influenza surveillance indicators were monitored each week in Wales:

Primary care and community indicators

- GP consultations for ILI and ARI
- Sentinel GP virological surveillance to confirm influenza virus infection
- Respiratory related consultations with Out of Hours primary care doctors
- Influenza related calls to NHS Direct Wales

Secondary care indicators

- Respiratory diagnostic test data for all hospital and non-sentinel GP patients
- Respiratory diagnostic data for patients attending an A&E, medical assessment, or urgent care unit
- Respiratory diagnostic test data for patients in intensive care units
- Rapid respiratory diagnostic test data for influenza and RSV across hospital settings

Indicators from other settings

- Outbreaks of ILI and other ARI in institutional settings e.g. hospitals, care homes, schools and nurseries, reported to Public Health Wales Health Protection Teams.

In addition, genetic characterisation of influenza viruses from sentinel GP samples and a proportion of hospital patients is carried out throughout the season using Whole Genome Sequencing (WGS).

There may be an ongoing impact of the COVID-19 control measures that were implemented throughout the previous two years and changes to the way individuals engaged with health care services. Therefore data may not be comparable to previous seasons.

1.2 Influenza immunisation

The aim of annual immunisation against influenza is to protect individuals at increased risk, prevent spread within family, care and community settings and minimise the health impact of influenza on the population of Wales, and contribute to the reduction of antimicrobial resistance by preventing secondary bacterial infections [1].

In Wales in 2022/23, influenza immunisation was offered free of charge to all people aged 50 years and older, people aged between six months and 49 years in clinical risk groups (chronic respiratory disease, chronic heart disease, chronic renal disease, chronic liver disease, chronic neurological conditions, diabetes mellitus, immunosuppression, asplenia/ dysfunction of the spleen, and adults who are category III obese (have a BMI of 40 or greater), all pregnant women, and residents of long-stay care homes. Vaccination was also offered to those who were a main carer for an elderly or disabled person whose welfare may be at risk if the carer fell ill, third sector carers, staff working in all adult residential care homes and nursing care homes, domiciliary carers, members of voluntary organisations providing planned emergency first aid and community first responder scheme members. Again, all people with a learning disability were eligible for vaccination this year [1].

An extended vaccination programme continued to be offered during 2022/23, including household contacts of immunosuppressed individuals, individuals with severe mental illness, those experiencing homelessness and adults in prisons who did not fall in to another eligible category [1].

In addition, influenza immunisation was also recommended for all other health and social care workers who are in direct contact with patients or service users. Care home staff with regular client contact and domiciliary carers may access free NHS flu vaccination via a community pharmacy but employing organisations are responsible for arranging immunisation of frontline health and social care workers in other settings.

The childhood influenza vaccination programme using live attenuated influenza vaccine (LAIV) nasal spray (Fluenz Tetra®) once again included children aged two to 15 years old (age on 31 August 2022) [1].

In most health boards influenza immunisations were delivered to the two and three year old age groups through general practices. Since the 2016/17 influenza season, three year olds in nursery classes attached to primary schools in Cwm Taf Morgannwg University Health Board (UHB) have been offered LAIV immunisation through school nursing services, in addition to being able to receive the vaccine through general practice. Vaccination for the primary (four to 10 year olds) and secondary (11 to 15 year olds) school year groups was delivered by the school nursing services across Wales.

Public Health Wales monitor influenza immunisation uptake rates in general practices and report them weekly to GPs and health boards throughout the seasonal campaign and produce end of season influenza immunisation coverage statistics at a national, health board and local authority level.

Immunisation statistics contained in this report record coverage in Welsh residents who are registered with a GP in Wales as at 25th April 2023 and therefore are not a measure of all those who have been immunised during the course of the immunisation campaign, excluding those no longer registered.

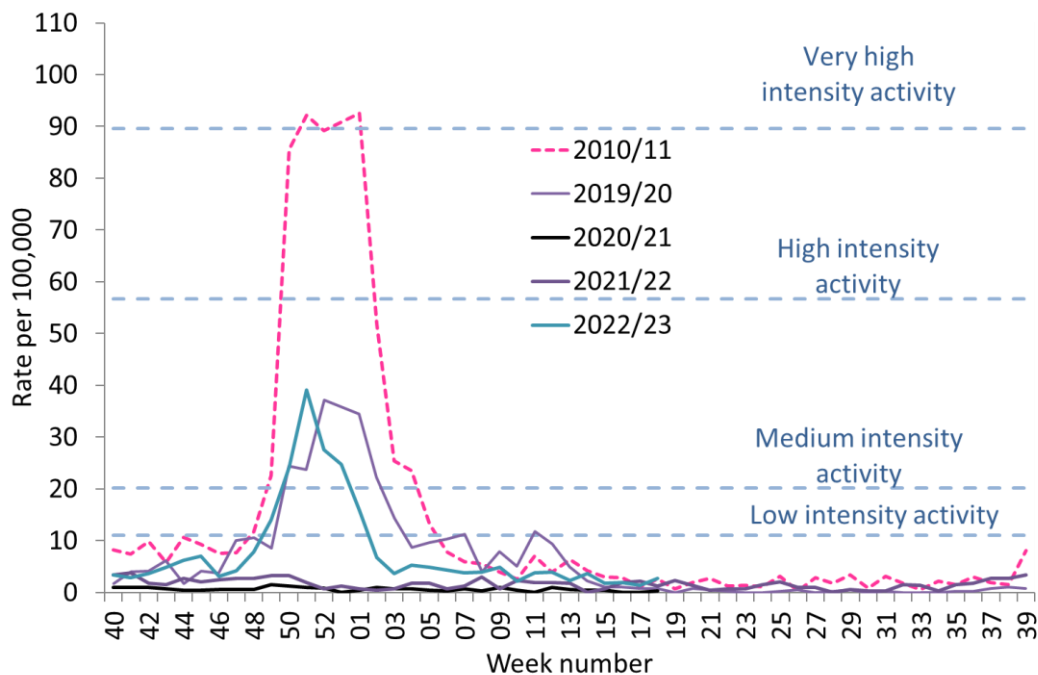
2. Influenza Surveillance in 2022/23

2.1 Community indicators - GP consultations for influenza-like illness (ILI)

A low intensity (or baseline) threshold level of 11.0 ILI consultations per 100,000 population was used as one of the indicators that influenza may be circulating in the community at low levels calculated using the Moving Epidemic Method (MEM) [2]. The sentinel GP ILI thresholds, for medium, high and very high intensity activity in the community were 20.2, 56.7 and 89.6 per 100,000 consultations respectively.

The peak sentinel GP ILI consultation rate was 39.1, during week 51 2022. Consultation rate above baseline activity was observed from week 49 2022 to week 2 2023 (Figure 2.1.1). The cumulative consultation rate for ILI was highest in patients aged 25 to 44 years (343 per 100,000 for the period 2022 week 40 to 2023 week 19 (Figure 2.1.3).

Figure 2.1.1. Public Health Wales sentinel GP weekly consultation rate for influenza-like illness 2022/23¹



¹Due to a technical issue affecting data submitted from sentinel practices utilising a specific brand of GP software, consultation rates for ILI in were calculated using a subset of data from 20 practices during week 47 2019 to week 03 2020.

The sentinel GP consultation rate for ILI was above the threshold for medium intensity from week 49 2022 to week 2 2023 reaching a peak of 39.1 per 100,000 in week 51 of 2022. (Table 2.1.1).

Table 2.1.1. Comparison of sentinel GP consultation rates from 2015/16 to 2022/23

	Influenza Season							
	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/2022	2022/2023
Start of season (week of year)	1	49	51	52	50	Threshold to indicate low level activity not exceeded	Threshold to indicate low level activity not exceeded	40
Weeks sentinel GP ILI consultation rate above baseline threshold (n)	14	11	14	9	8			6
Weeks sentinel GP ILI consultation rate above medium activity levels (n)	7	4	12	4	5	0	0	4
Weeks sentinel GP ILI consultation rate above high activity levels (n)	0	0	4	0	0	0	0	0
Peak sentinel GP ILI consultation rate	25.8	22.8	74.5	22.9	37.1	1.5	3.8	39.08

Figure 2.1.2. Public Health Wales sentinel GP weekly consultation rate for influenza-like illness 1996 to 2023

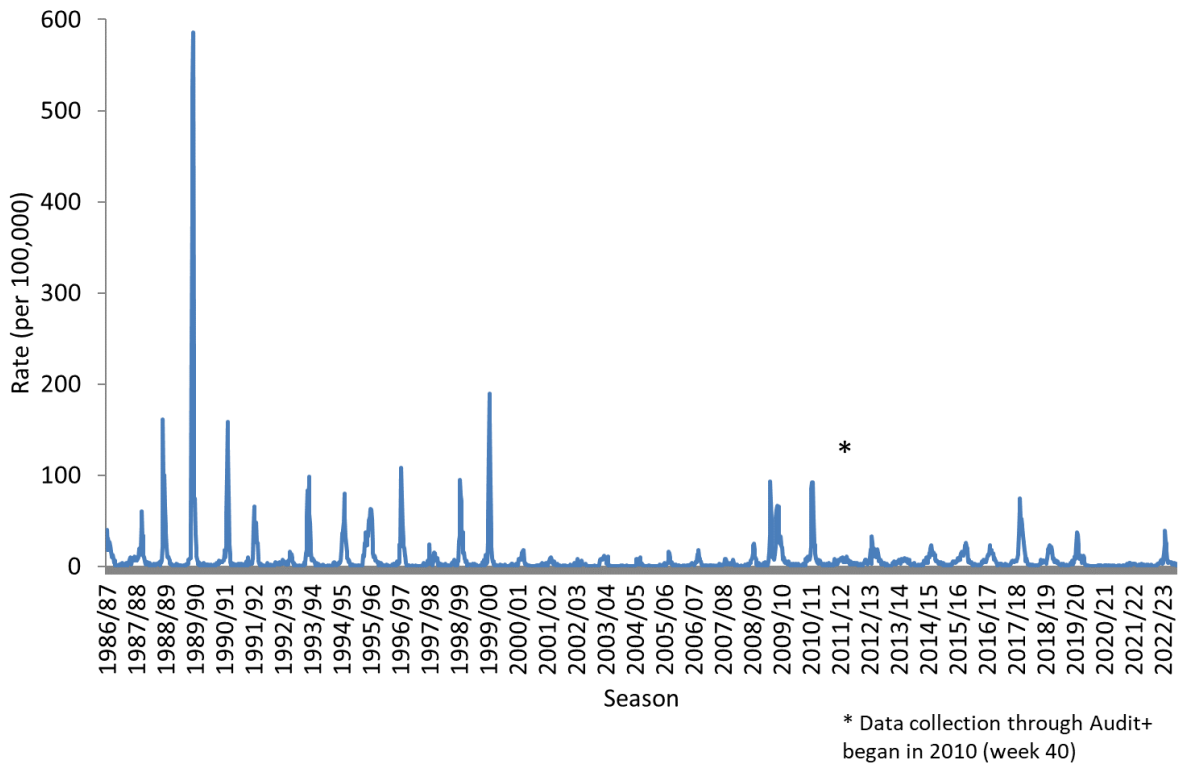
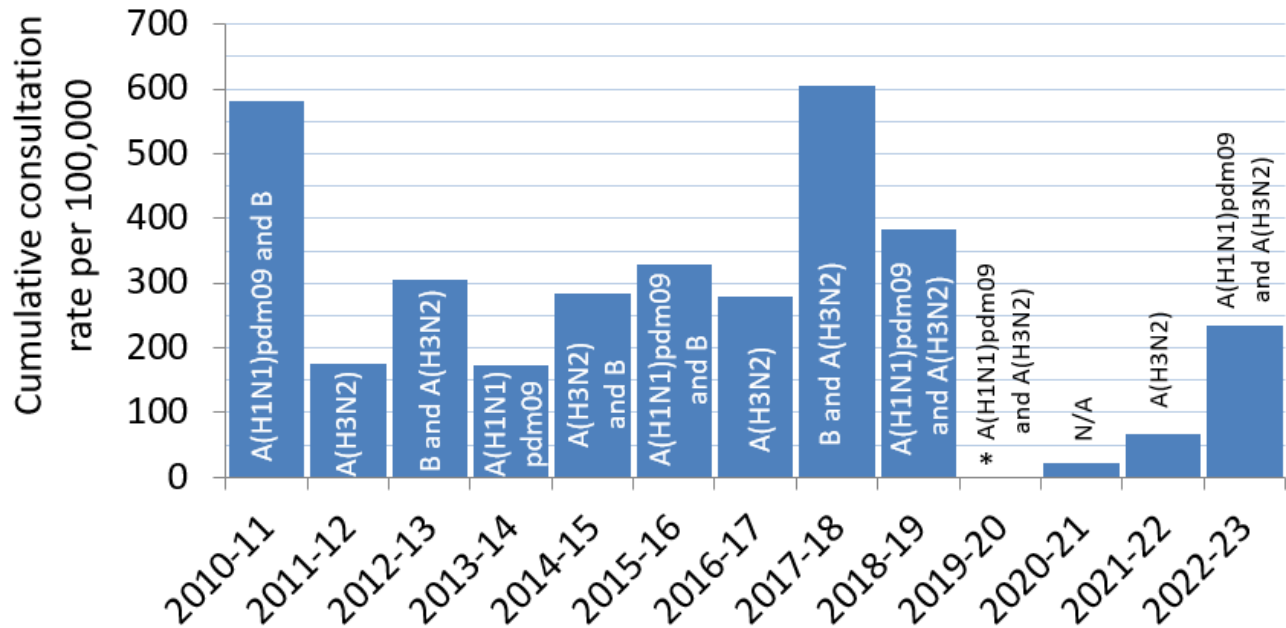
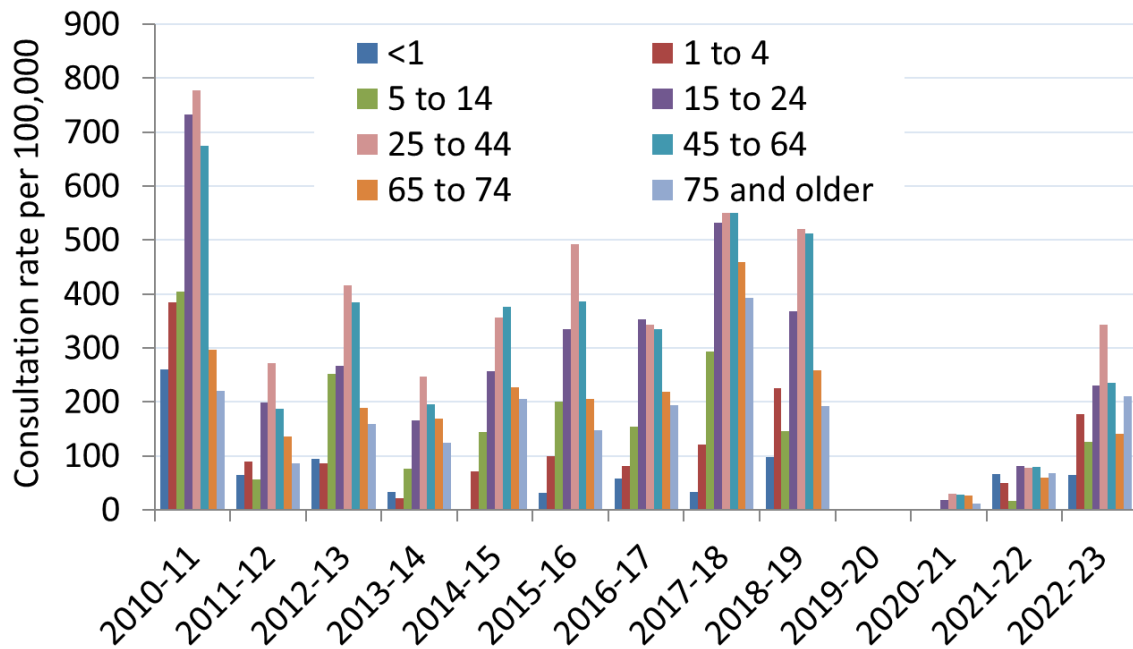


Figure 2.1.3. Cumulative consultation rates for influenza-like illness, per season (from week 40 to week 20), in sentinel GP patients 2010/11 to 2022/23. Dominant circulating types of influenza are indicated for each season.



*Due to this technical issue it was not possible to calculate the cumulative sentinel GP ILI rate by age group for the whole 2019/20 season

Figure 2.1.4. Age-group specific cumulative consultation rates for influenza-like illness, per season (from week 40 to week 20), in sentinel GP patients 2010/11 to 2022/23



*Due to this technical issue it was not possible to calculate the cumulative sentinel GP ILI rate by age group for the whole 2019/20 season

2.2 Community indicators - Virological surveillance in the community

Between 2022 week 40 and 2023 week 15 (3rd October 2022 to 16th April 2023), there were 3,946 samples collected for virological testing by general practices in Wales. From this total, 2,250 samples were submitted by 34 sentinel GPs, with a mean of 66 samples per participating practice. This is the sixth year that all sentinel GPs were asked to collect surveillance samples for an expanded number of clinical conditions, which include ARI (as well as SARS-CoV2), acute bronchitis, and bronchiolitis, in addition to ILI. Of the samples collected, 1,006 were clinically diagnosed with ILI (44.7%), 741 with ARI (32.9%), 33 with bronchiolitis (1.5%) and 293 with acute bronchitis (13.0%). Information was missing for 177 samples (7.9%).

Of the 2,250 patient samples submitted, all 2,250 were tested. Of these, 377 were positive for influenza.

Surveillance samples are routinely tested for: influenza, SARS-CoV2, RSV, adenovirus, *Mycoplasma pneumoniae*, rhinovirus, parainfluenza, human metapneumovirus, human bocavirus, seasonal coronaviruses, enterovirus D-68 and other enteroviruses. One or more other causes of seasonal respiratory infection were detected in 52.9% (n=1,189) of samples, and 47.1% (n=1,061) were negative for all routinely tested pathogens.

Sample submissions by sentinel GPs peaked in week 50 of 2022 (week ending 18th December, 198 patient samples)(Figure 2.2.1).

Figure 2.2.1. Results from Public Health Wales GP sentinel virological surveillance for influenza and other seasonal causes of respiratory illness by

Week, 2022/23. The sentinel GP ILI consultation rate per 100,000 is also included.

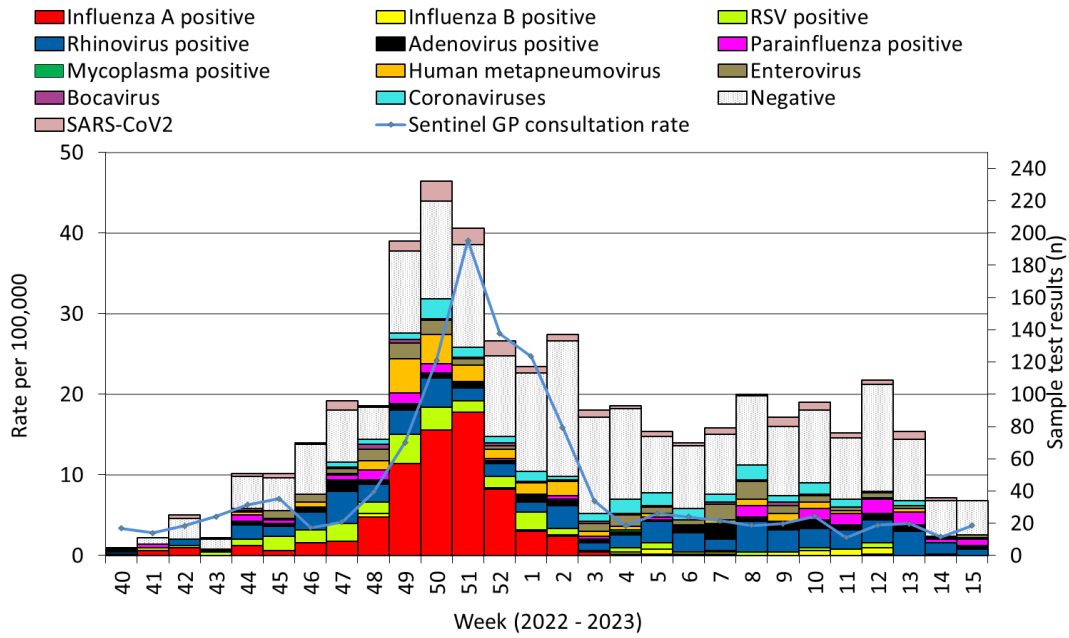


Table 2.2.1. Samples from sentinel GP patients with influenza-like symptoms testing positive for influenza and other respiratory pathogens between 2022 week 40 and 2023 week 15 by age group^{1,2}

Age Group	Samples Tested		All Influenza		Other		Negative	
	n	%	n	%	n	%	n	n
Under 1	38	1.7%	1	0.3%	28	3.3%	10	0.9%
1 to 4	198	8.8%	26	6.9%	143	16.6%	40	3.8%
5 to 9	153	6.8%	16	4.2%	78	9.1%	65	6.1%
10 to 14	139	6.2%	35	9.3%	47	5.5%	61	5.7%
15 to 24	240	10.7%	48	12.7%	86	10.0%	113	10.7%
25 to 34	308	13.7%	72	19.1%	92	10.7%	150	14.1%
35 to 44	248	11.0%	55	14.6%	71	8.3%	129	12.2%
45 to 64	538	23.9%	87	23.1%	172	20.0%	284	26.8%
65 to 74	200	8.9%	22	5.8%	74	8.6%	105	9.9%
75 and older	188	8.4%	15	4.0%	69	8.0%	104	9.8%
Total	2250	100%	377	100%	860	100%	1061	100%

¹ There were 1,059 samples from sentinel GP patients which tested positive for one respiratory pathogen, samples 145 which tested positive for two respiratory pathogens, 19 samples which tested positive for three respiratory pathogens, and five samples which tested positive for four respiratory pathogens.

² Surveillance samples are routinely tested for: influenza, SARS-CoV2, RSV, adenovirus, *Mycoplasma pneumoniae*, rhinovirus, parainfluenza, human metapneumovirus, human bocavirus, seasonal coronaviruses, enterovirus D-68 and other enteroviruses.

Of all symptomatic patients who visited a sentinel practice and were tested for seasonal respiratory pathogens between week 40 2022 and week 15 2023, 23.9% were aged 45 to 64 years (Table 2.2.1), the median age of patients tested was 36 years.

2.3 Hospital indicators - Virological surveillance

From 2022 week 40 to 2023 week 15, there were 80,360 samples collected and tested by Public Health Wales Microbiology services out of which 54,280 samples were from hospital patients presenting with symptoms of respiratory infection (Table 2.3.1). During 2018-19 a rapid test service for influenza was rolled in addition to existing PCR diagnostic services in most health boards. In the 2020-21 season, this service was expanded and was available across all health boards. The rapid service is intended to help guide patient pathways and improve timeliness of decisions on continuation of antiviral treatments. Samples collected can be tested using one of three systems, differing in their abilities to provide influenza sub-type information and to detect non-influenza pathogens.

Two of the systems used are PCR screens for influenza, RSV, adenovirus, *Mycoplasma pneumoniae*, rhinovirus, enterovirus, parainfluenza, human metapneumovirus, seasonal coronavirus, SARS-CoV2 and where possible, influenza A results are subtyped. The third system in use only screens for influenza A, influenza B, RSV and SARS-CoV2; and influenza A results are not subtyped. Patients may have more than one sample collected for an episode of respiratory illness and these samples could be tested using different test systems; patients who only had one sample collected and tested using the third platform are not included in the denominator for the number of patients screened for other pathogens included in respiratory surveillance.

Of the 54,280 testing episodes in hospital patients that had a sample collected from a hospital setting, all were tested for influenza and RSV, with 72.3% (39,266/54,280) tested for all respiratory pathogens and 27.7% (n=15,014/54,280) tested for influenza, RSV and SARS-CoV2 only.

The weekly number of patients tested for seasonal respiratory illness peaked during week 51 of 2022 (week ending 25th December 2021, n=3,534). Of the samples from patients in hospital, 38.6% (n=20,926) were collected from patients attending A&E or urgent care wards, 48.1% (n=26,126) and 7.2% (n=3,906) were collected from general inpatients wards and outpatient departments respectively, 4.0% (n=2,164) were collected from patients admitted to an intensive care and 2.1% (n=1,158) of samples were from unknown hospital locations.

Of the hospital patients tested, 9.4% (n=5,107) were confirmed with influenza, of whom 94.3% (n=4,817) had influenza A only, 286 patients had influenza B only and four had dual infections of both influenza A and influenza B (Table 2.3.1). Of the samples testing positive for influenza A, 48.9% (n=2,357) were influenza A(H3N2), 26.2% (n=1,262) were influenza A(H1N1) and 24.9% (n=1,202) were untyped.

The most commonly detected non-influenza respiratory pathogens were SARS-CoV2 (15.1%, 8,197/54,280) and rhinovirus (15.1%, 5,942/39,266).

Other detected causes of respiratory infection included: adenovirus (7.3%, 2,862/39,266), enterovirus (3.3%, 1,292/39,266), seasonal coronavirus (4.5%, 1,772/39,266), human metapneumovirus (4.2%, 1,667/39,266), parainfluenza (3.3%, 1,296/39,266), RSV (6.75%, 3,665/54,280), and *Mycoplasma pneumoniae* (0.01%, 3/39,266). Forty-four percent (17,219/39,266) of patients tested for all nine routinely screened pathogens were negative, and from the patients that were only tested for influenza, RSV and SARS-CoV2, 71.5% (10,734/15,014) were negative for all three pathogens.

Table 2.3.1. Results from patients tested for influenza and RSV in Wales between 2022 week 40 and 2023 week 15, by sample location^{2,3}

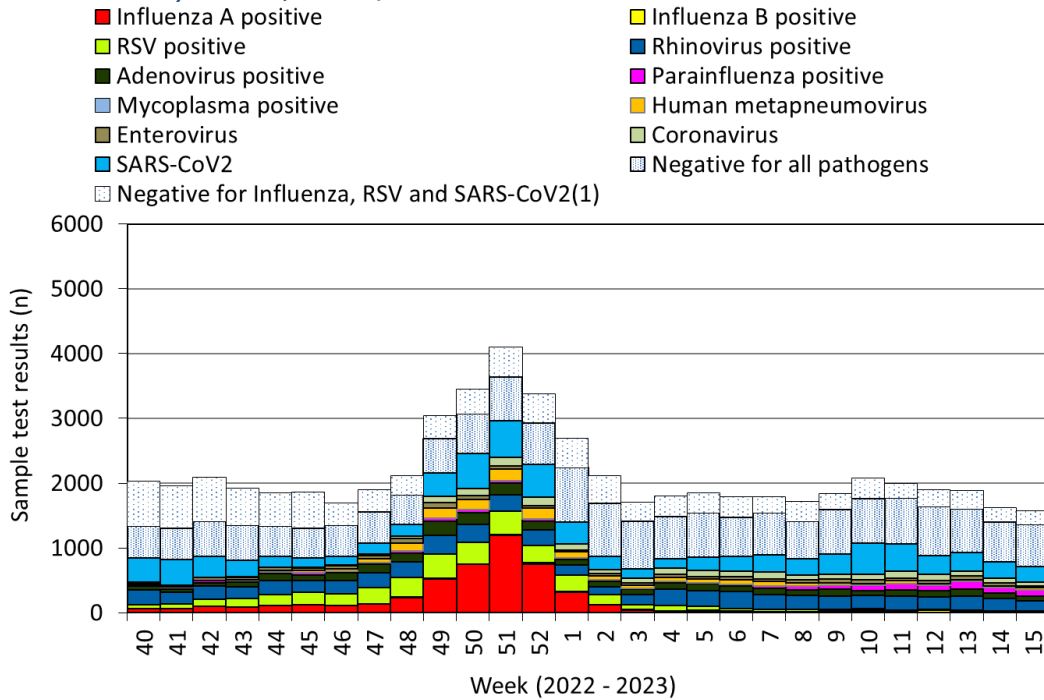
Sample Location	Samples tested		Influenza A		Influenza B		RSV		Negative ¹	
	n	%	n	%	n	%	n	%	n	%
Sentinel Practice	2250	2.8%	358	4.9%	25	6.0%	121	2.6%	1061	2.4%
Non-sentinel Practice	1696	2.1%	289	4.0%	18	4.3%	91	1.9%	905	2.1%
Total Community Samples	3946	4.9%	647	8.9%	43	10.2%	212	4.5%	1966	4.5%
Hospital - General	31190	38.8%	2532	34.7%	144	34.3%	2452	52.4%	14517	33.4%
Hospital - A&E	20926	26.0%	2189	30.0%	143	34.0%	1159	24.8%	11763	27.0%
Hospital - ITU	2164	2.7%	100	1.4%	3	0.7%	54	1.2%	1673	3.8%
Total Hospital Samples	54280	67.5%	4821	66.0%	290	69.0%	3665	78.4%	27953	64.2%
Other / Unknown locations	22134	27.5%	1834	25.1%	87	20.7%	799	17.1%	13610	31.3%
Total	80360	100%	7302	100%	420	100%	4676	100%	43529	100%

¹This measure represents the number of samples negative for all pathogens routinely tested for. A proportion of samples included have only been tested for influenza, RSV and SARS-CoV2.

²Samples positive and negative will not add up to total screens as some individuals tested positive for more than one pathogen.

³Surveillance samples tested using a full PCR test are routinely tested for: influenza, RSV, adenovirus, *Mycoplasma pneumoniae*, rhinovirus, enterovirus, parainfluenza, human metapneumovirus and SARS-CoV2.

Figure 2.3.1. Results from respiratory tests carried out on samples from patients in hospitals in Wales by Week, 2022/23



¹ A small proportion of samples have only been tested for influenza, RSV and SARS-CoV2.

There were 5,107 hospital samples testing positive for influenza between week 40 2022 to week 15 2023 (Figure 2.3.1). Influenza positivity in hospital samples exceeded the threshold suggestive of seasonal circulation. Proportion of samples testing positive for influenza peaked in week 51, 2022 (n=1,206/3,534, 34.1% positivity). The peak week for sample test positivity for RSV was week 48 of 2022 (n=297/1,804, 16.5%).

Table 2.3.2. Patient samples from all hospital locations testing positive for influenza and RSV between 2022 week 40 and 2022 week 15 by age group^{2,3}

Age Group	Samples tested		All Influenza		RSV		Negative ¹	
	n	%	n	%	n	%	n	%
Under 1	4193	7.7%	255	5.0%	1077	29.4%	993	3.6%
1 to 4	5717	10.5%	733	14.4%	837	22.8%	965	3.5%
5 to 9	2313	4.3%	335	6.6%	133	3.6%	796	2.8%
10 to 14	1106	2.0%	231	4.5%	52	1.4%	515	1.8%
15 to 24	1865	3.4%	291	5.7%	74	2.0%	1114	4.0%
25 to 34	2730	5.0%	412	8.1%	62	1.7%	1640	5.9%
35 to 44	2588	4.8%	315	6.2%	80	2.2%	1661	5.9%
45 to 64	8948	16.5%	754	14.8%	294	8.0%	5839	20.9%
65 to 74	7636	14.1%	573	11.2%	260	7.1%	4768	17.1%
75 and older	17184	31.7%	1208	23.7%	796	21.7%	9662	34.6%
Total	54280	100%	5107	100%	3665	100%	27953	100%

¹This measure represents the number of samples negative for all pathogens routinely tested for. A proportion of samples included have only been tested for influenza, RSV and SARS-CoV2.

²Samples positive and negative will not add up to total screens as some individuals tested positive for more than one pathogen. There are no samples from patients with unknown age.

³Samples are routinely tested for: influenza, RSV, adenovirus, *Mycoplasma pneumoniae*, rhinovirus, enterovirus, parainfluenza, human metapneumovirus and SARS-CoV2.

Table 2.3.3a. Patients testing positive for influenza in Wales, between 2022 week 40 and 2023 week 15, by hospital location and age group

Age Group	General In & Out Patient Wards		Urgent Care & A/E Wards		ICU Wards	
	n	%	n	%	n	%
Under 1	195	7.3%	57	2.4%	3	2.9%
1 to 4	541	20.2%	191	8.2%	1	1.0%
5 to 9	250	9.4%	84	3.6%	1	1.0%
10 to 14	169	6.3%	61	2.6%	1	1.0%
15 to 24	97	3.6%	191	8.2%	3	2.9%
25 to 34	140	5.2%	263	11.3%	9	8.7%
35 to 44	95	3.6%	203	8.7%	17	16.5%
45 to 64	266	10.0%	459	19.7%	29	28.2%
65 to 74	248	9.3%	307	13.2%	18	17.5%
75 and older	671	25.1%	516	22.1%	21	20.4%
Total	2672	100%	2332	100%	103	100%

Table 2.3.3b. *Patients testing positive for RSV in Wales, between 2022 week 40 and 2023 week 15, by hospital location and age group*

Age Group	General In & Out Patient Wards		Urgent Care & A/E Wards		ICU Wards	
	n	%	n	%	n	%
Under 1	814	33.2%	253	21.8%	10	18.5%
1 to 4	650	26.5%	184	15.9%	3	5.6%
5 to 9	112	4.6%	21	1.8%	0	0.0%
10 to 14	39	1.6%	12	1.0%	1	1.9%
15 to 24	45	1.8%	28	2.4%	1	1.9%
25 to 34	29	1.2%	30	2.6%	3	5.6%
35 to 44	37	1.5%	39	3.4%	4	7.4%
45 to 64	137	5.6%	142	12.3%	15	27.8%
65 to 74	131	5.3%	120	10.4%	9	16.7%
75 and older	458	18.7%	330	28.5%	8	14.8%
Total	2452	100%	1159	100%	54	100%

Of all the symptomatic patients in hospitals who were tested for seasonal respiratory pathogens between 2022 week 40 and 2023 week 15, 31.7% were aged 75 or older and 16.5% were 45 to 64 years (Table 2.3.2), the median age of patients tested was 61 years.

For those testing positive for influenza (n=5,107), 23.7% were aged 75 years and older, 14.8% were aged 45 to 64 years and 14.4% were 1 to 4 years of age; the median patient age was 44 years. The median age of patients testing positive for RSV (n=3,665) was 3 years, 29.4% of all these patients were under 1 year old, 22.8% of patients were 1 to 4 years old, 21.7% were 75 years and older and 8.0% were 45 to 64 years old (Table 2.3.2).

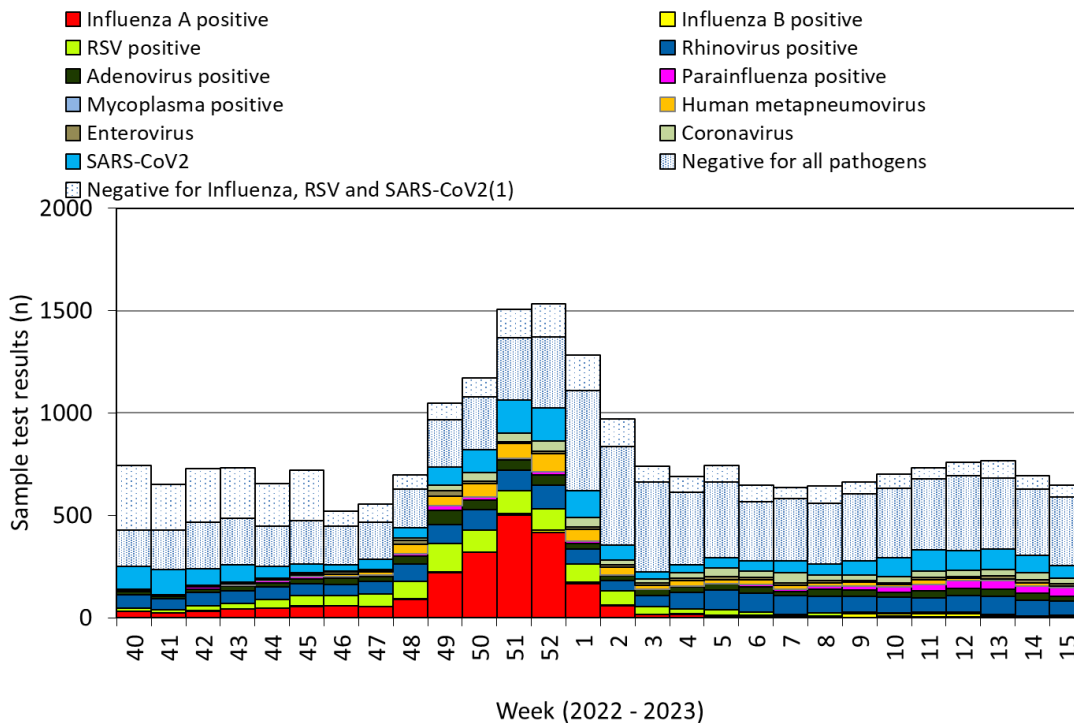
Patients who were aged 75 years and older accounted for the highest proportion of confirmed influenza cases in general inpatient and outpatient hospital wards (671/2,672, 25.1%) and the highest proportion of confirmed influenza cases in accident & emergency or urgent care ward (516/2,332, 22.1%). Patients aged 45 to 64 years accounted for the highest proportion of confirmed influenza cases in those who were tested while in an intensive care ward (29/103, 28.2%). (Table 2.3.3a).

Children aged under one year old accounted for the highest proportion of confirmed cases of RSV in general hospital wards (814/2,452, 33.2%). Patients aged 75 years and older accounted for the highest proportion of confirmed RSV cases in accident & emergency or urgent care ward (330/1,159, 28.5%). Patients 45 to 64 years accounted for the highest proportion of confirmed RSV cases in intensive care units (15/54, 27.8%). (Table 2.3.3b).

2.4 Hospital indicators - patients in accident and emergency departments

During the period 2022 week 40 to 2023 week 15, 20,926 patients attending an accident & emergency or urgent care ward (A&E ward) with symptoms of an acute respiratory infection had samples collected and were tested. These samples may include screening tests for non-symptomatic individuals. Of the 20,926 patients attending an A&E ward that had a sample collected, all were tested for influenza, RSV and SARS-CoV2, 79.1% (n= 16,549/20,926) were tested for all respiratory pathogens included for surveillance purposes and 20.1% (n=4,377/20,926) were only tested for influenza, RSV and SARS-CoV2.

Figure 2.4.1. Results from respiratory tests carried out on samples from patients in A&E or urgent care units in Wales by Week, 2022/23



¹ A small proportion of samples included have only been tested for influenza, RSV and SARS-CoV2.

From patients tested in A&E, 2,332 were confirmed with influenza, of whom 2,189 were positive for influenza A only, 143 for influenza B. Typing data was available for 1,730 influenza A samples, 617 samples were influenza A (H1N1), 1,113 were influenza A (H3).

The most commonly detected non-influenza respiratory pathogens from the A&E patients tested were SARS-CoV2 (10.8%, n= 2,258/20,926), rhinovirus (12.9%, n=2,129/16,549) and RSV (5.5%, n= 1,159/20,926). Other detected causes of respiratory infection included: enterovirus (1.8%, n=300/16,549), seasonal coronaviruses (4.0%, n=661/16,549), adenovirus (5.2%, n=857/16,549), parainfluenza (2.6%, n=437/16,549), human metapneumovirus (4.1%, n=681/16,549) and *Mycoplasma pneumoniae* (0.01%, n=1/16,549). Fifty percent of the 16,549 A&E patient samples receiving a full PCR screen tested negative for all nine pathogens, and from the patients that were only tested for influenza, RSV and SARS-CoV2, 78.3% (3,426/4,377) were negative for all three pathogens.

Table 2.4.1. Samples from patients in A&E testing positive for influenza and RSV between 2022 week 40 and 2023 week 15 by age group^{2,3}

Age Group	Samples Tested		Influenza A		Influenza B		RSV		Negative ¹	
	n	%	n	%	n	%	n	%	n	%
Under 1	876	4.2%	49	2.2%	8	5.6%	253	21.8%	151	1.3%
1 to 4	1363	6.5%	171	7.8%	20	14.0%	184	15.9%	205	1.7%
5 to 9	531	2.5%	80	3.7%	4	2.8%	21	1.8%	168	1.4%
10 to 14	263	1.3%	55	2.5%	6	4.2%	12	1.0%	114	1.0%
15 to 24	978	4.7%	160	7.3%	31	21.7%	28	2.4%	552	4.7%
25 to 34	1382	6.6%	232	10.6%	31	21.7%	30	2.6%	757	6.4%
35 to 44	1288	6.2%	172	7.9%	31	21.7%	39	3.4%	774	6.6%
45 to 64	4096	19.6%	451	20.6%	8	5.6%	142	12.3%	2600	22.1%
65 to 74	3300	15.8%	305	13.9%	2	1.4%	120	10.4%	2118	18.0%
75 and older	6849	32.7%	514	23.5%	2	1.4%	330	28.5%	4324	36.8%
Total	20926	100%	2189	100%	143	100%	1159	100%	11763	100%

¹ This measure represents the number of samples negative for all pathogens routinely tested for. A small proportion of samples included have only been tested for influenza, RSV and SARS-CoV2.

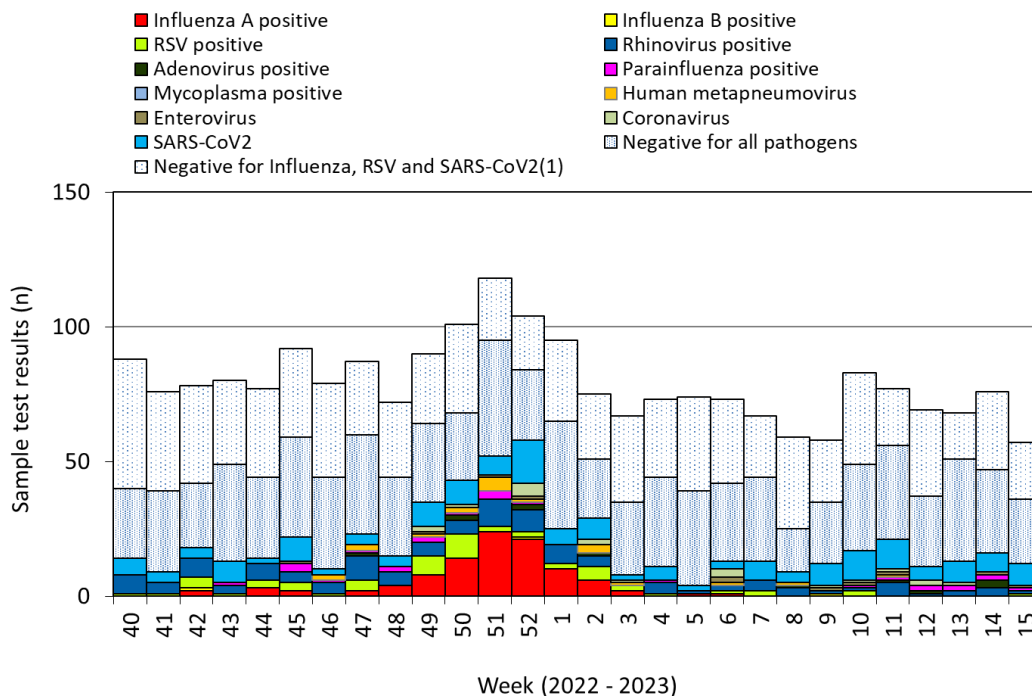
² Samples positive and negative will not add up to total screens as some individuals tested positive for more than one pathogen.

³ Samples are routinely tested for: influenza, RSV, adenovirus, *Mycoplasma pneumoniae*, rhinovirus, enterovirus, parainfluenza and human metapneumovirus and SARS-CoV2.

2.5 Hospital indicators - patients in intensive care units

During the period 2022 week 40 to 2023 week 15, 2,164 samples were collected from patients in an intensive care setting with symptoms of an acute respiratory infection. Of the 2,164 patients in an intensive care unit that had a sample collected, all were tested for influenza, RSV and SARS-CoV2, with 57.0% (n=1,233/2,164) tested for all respiratory pathogens included for surveillance purposes and 43.0% (n=931/2,164) tested for influenza, RSV and SARS-CoV2 only.

Figure 2.5.1. Results from respiratory tests carried out on samples from patients in intensive care units in Wales by Week, 2022/23



¹ A small proportion of samples included have only been tested for influenza, RSV and SARS-CoV2.

There were 103 cases of influenza detected in ICU settings throughout the whole season. Of the 103 influenza cases detected, 21 were A (H1N1), 40 A (H3) and 39 A (not subtyped). There were 3 cases of influenza B. Influenza in ICU settings peaked in week 51 2022, with 24 samples testing positive for influenza A.

The most commonly detected non-influenza respiratory pathogens, from the ICU patients tested, were rhinovirus (9.4%, n=116/1,233) and SARS-CoV2 (8.3%, n= 179/2,164). Other detected causes of respiratory infection included: human metapneumovirus (1.6% n=20/1,233), enterovirus (0.9%, n=11/1,233), seasonal coronaviruses (1.6%, n=20/1,233), adenovirus (1.0%, n=12/1,233) and parainfluenza (2.0%, n=25/1,233). Sixty-nine percent (n=848/1,233) of ICU patient samples screened for all nine pathogens tested negative, and from the ICU patients that were only tested for influenza, RSV and SARS-CoV2, 88.6% (n=825/931) were negative for those pathogens (Table 2.5.1).

Table 2.5.1. Samples from patients in ICU/HDU testing positive for influenza and RSV between 2022 week 40 and 2023 week 15 by age group²

Age Group	Samples Tested		Influenza A		Influenza B		RSV		Negative ¹	
	n	%	n	%	n	%	n	%	n	%
Under 1	228	10.5%	3	3.0%	0	0.0%	10	18.5%	181	10.8%
1 to 4	32	1.5%	0	0.0%	1	33.3%	3	5.6%	6	0.4%
5 to 9	12	0.6%	1	1.0%	0	0.0%	0	0.0%	2	0.1%
10 to 14	10	0.5%	1	1.0%	0	0.0%	1	1.9%	7	0.4%
15 to 24	81	3.7%	3	3.0%	0	0.0%	1	1.9%	62	3.7%
25 to 34	118	5.5%	9	9.0%	0	0.0%	3	5.6%	89	5.3%
35 to 44	161	7.4%	16	16.0%	1	33.3%	4	7.4%	126	7.5%
45 to 64	665	30.7%	28	28.0%	1	33.3%	15	27.8%	531	31.7%
65 to 74	443	20.5%	18	18.0%	0	0.0%	9	16.7%	350	20.9%
75 and older	414	19.1%	21	21.0%	0	0.0%	8	14.8%	319	19.1%
Total	2164	100%	100	100%	3	100%	54	100%	1673	100%

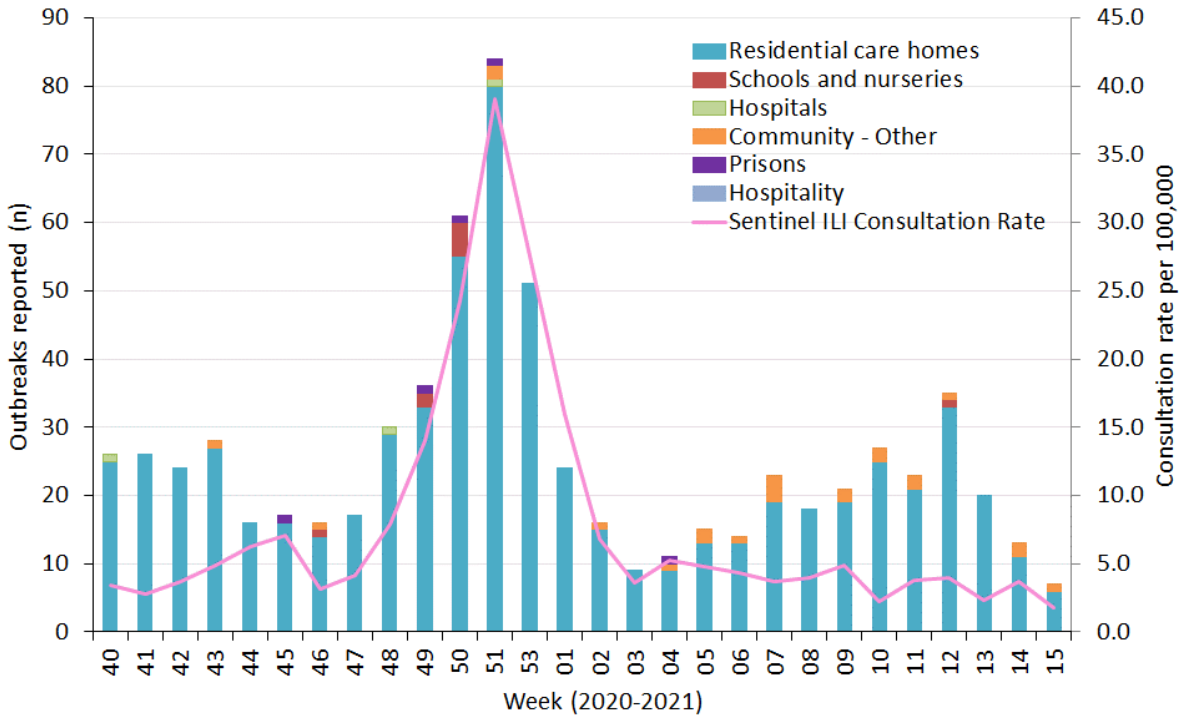
¹ This measure represents the number of samples negative for all pathogens routinely tested for. A small proportion of samples included have only been tested for influenza, RSV and SARS-CoV2.

² Samples are routinely tested for: influenza, RSV, adenovirus, *Mycoplasma pneumoniae*, rhinovirus, enterovirus, parainfluenza and human metapneumovirus and SARS-CoV2.

2.6 Outbreaks of influenza, ILI or acute respiratory illness

During the 2022/23 influenza season in Wales there were 708 outbreaks of influenza, ILI or acute respiratory illness (ARI) reported to Public Health Wales Health Protection Teams (Figure 2.6.1), compared to 1,266 reported outbreaks during the 2021/22 season. Outbreaks were reported from 2022 week 40 to 2023 week 15. 683 outbreaks were SARS-CoV2, of which 681 were confirmed, and 2 were suspected of SARS-CoV2. Of the confirmed SARS-CoV2 incidents, 5 had only one reported case. Of the other outbreaks, 17 were influenza A; there were 5 outbreaks of both SARS-CoV2 and influenza A and 3 outbreaks of influenza-like-illness with no respiratory result. Where influenza was detected in an outbreak, 4 were influenza A(H3), 2 were influenza A(H1N1) and 16 were influenza A(untyped). 94% (n=668) of the outbreaks were reported from residential homes, 3% (n=23) were reported from other community settings, 1% (n=9) were reported from school or nurse settings, 0.4% (n=3) were reported from hospital, and 0.7% (n=5) were reported from prison. 38% (n=270) of outbreaks occurred in South East Wales (covering Aneurin Bevan UHB, Cardiff and Vale UHB and Cwm Taf Morgannwg UHB areas), 37% (n=264) of the outbreaks occurred in Mid and West Wales (covering Swansea Bay UHB, Hywel Dda UHB and Powys THB), and 25% (n=174) of the outbreaks were reported from North Wales (covering Betsi Cadwaladr UHB).

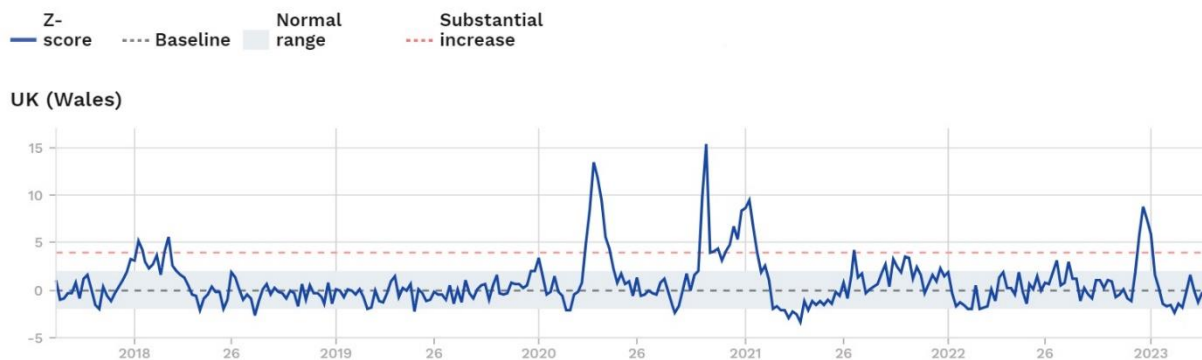
Figure 2.6.1. Outbreaks of acute respiratory illness reported to Public Health Wales Health Protection Team during the 2022/23 season, and sentinel GP ILI consultation rate per 100,000



2.7 Excess mortality during the influenza season

Surveillance of weekly all-cause mortality in Wales during 2022/23 was carried out using the EuroMoMo method [3]. In Wales, during the influenza season significant excess mortality was seen during 2022 week 50 to 2023 week 01 at an all Wales level.

Figure 2.7.1. Excess winter mortality, Wales; 2018-2023



3. Influenza virus characterisation, vaccine effectiveness and antivirals

3.1 Laboratory characterisation of influenza viruses

During the 2022/23 influenza season in Wales, there were 6990 laboratory-confirmed cases of influenza. At the start of the season influenza A(H3N2) dominated with co-circulation of influenza A(H1N1)pdm09, and influenza B occurring from December onwards.

In total, 3479 positive samples were referred to the National Influenza Centre for Wales for further subtyping by PCR and genetic characterisation by whole genome sequencing (WGS). Successful subtyping was achieved for 75% (5029/6687) by either direct detection and subtyping, or by referral and subtyping. Influenza A(H3N2) accounted for 64% (3234/5029) of all those subtyped, and A(H1N1)pdm09 accounted for 35% (1777/5029). Dual infections with A(H3N2) and A(H1N1)pdm09 were detected in 18 cases. Influenza B was confirmed in just 303 influenza cases.

Genetic characterisation by WGS was completed for 246 viruses; 222 (90.2%) were influenza A viruses and 24 (9.8%) were influenza B viruses.

Phylogenetic analysis of haemagglutinin (HA) revealed increasing divergence of genetic clades in A(H3N2) and, to a lesser degree A(H1N1)pdm09 (Appendix Figures B1, B2) following the return of influenza activity post the peak of the COVID-19 pandemic, with less genetic diversity observed in Wales of influenza B (Appendix Figure B3).

Characterisation of influenza A(H3N2) viruses (n=112) demonstrated dominance of subclade 3C.2a1b.2a.2b (46.4%). However, 5 other subclades also co-circulated in Wales, 24.1% belonged to subclade 3C.2a1b.2a.2a.1b; 20.5% belonged to subclade 3C.2a1b.2a.2a.3a.1; 7.1% belonged to subclade 3C.2a1b.2a.2a.1; with additional lower frequency detection (<1%) of subclades 3C.2a1b.2a.2a.3 and 3C.2a1b.2a.2a.3b.

Diagnostic challenges arose in December 2022 as an influenza A(H1N1)pdm09 virus emerged with matrix-1 protein (M1) mutations L41I and K98R (Appendix Figure B4) that affected the detection of the virus through a major diagnostic platform. In an effort to understand the genetic reason for the failure, and to monitor growth, more H1N1pdm09 viruses were submitted for characterisation during this period across the UK. In Wales, 88.2% (97/110) belonged to subclade 6B.1A.5a.2a.1, with a much lower frequency of subclade 6B.1A.5a.2a.

Influenza B started circulating much later in the season, and as a result just 24 viruses were characterised, all belonging to Victoria lineage, again confirming that no viruses of the Yamagata lineage were circulating in Wales. All characterised influenza B viruses belonged to clade V1A.3a.2.

3.2 Effectiveness of the 2022/23 seasonal influenza vaccine in the UK

During 2022/23 an adjuvanted quadrivalent vaccine (aQIV) was available for use in those aged 65 years. A quadrivalent cell culture vaccine (QIVc) was available for those eligible aged over 2 years in addition to the standard egg cultured quadrivalent influenza vaccine (QIVe) that is licensed for under 65 year olds. A quadrivalent recombinant influenza vaccine (QIVr) was also available for those aged over 18 years.

Provisional end of season estimates of influenza vaccine effectiveness against laboratory confirmed influenza in those requiring hospitalisation following an emergency care attendance in England were published in the UKHSA annual report [4]. Estimated overall adjusted vaccine effectiveness for the 2022/23 season measured using a test-negative case control design was 28% (95% CI 15% to 39%) in those aged 65 years and above, 32% (95% CI 13% to 47%) in those aged 18 to 64 years and 65% (95% CI 52% to 75%) in two to 17 year olds. Effectiveness was estimated to be higher against influenza A(H3N2) compared to A(H1N1)pdm09 although there was greater uncertainty in A(H1N1)pdm09 estimates due to low circulation.

The effectiveness of QIVc vaccine in the 18 to 64 year age group against hospitalisation was 35% (95% CI 15% to 51%). In those aged two to 17 years of age effectiveness for LAIV was 64% (95% CI 49% to 75%) compared to 72% (95%CI 24% to 89%) for QIVc. The effectiveness of aQIV vaccine in the 65 years and over age group was 27% (95%CI 14 to 38%) compared to 30% (95%CI -14 to 57%) for QIVc.

Data published in May 2023 contained information from six vaccine effectiveness studies carried out in 16 European countries, including the United Kingdom. Estimates of overall effectiveness against laboratory confirmed influenza A varied from 27% to 44%, depending on study country [5].

3.3 Antiviral prescribing rates and virus sensitivity

The GP prescribing rate of oseltamivir in Wales was measured using data collected through Audit+ on coded prescriptions in general practice. Prescribing of influenza antivirals in general practice was authorised under the Selected List Scheme (SLS) in the period 25th November 2022 to 3rd May 2023. Prescribing rates followed a similar trend to the sentinel GP consultation rate for ILI. The rate peaked at 10.2 prescriptions per 100,000 practice population during week 48 2022 (week ending 4th December, Figure 3.3.1), which was three weeks before the peak for ILI consultations in sentinel practices. Using the subset of sentinel practices, the peak in prescribing rate during 2022/23 was the highest seen since 2010/11 peak prescribing rate in Wales (Table 3.3.1). However, comparisons should be made with caution as prescribing patterns may differ between practices. During the 2022/23 season in the UK, most viruses were fully susceptible and only small numbers of viruses were detected with reduced sensitivity to oseltamivir or zanamivir [4].

Antiviral susceptibility of viruses was performed by genetic characterisation of the neuraminidase (NA), matrix-2 protein (M2) and Polymerase acidic protein (PA) genes.

Susceptibility to the neuraminidase inhibitors oseltamivir and zanamivir was performed by analysis of the NA gene for 243 viruses (H3N2 n=111; H1N1pdm09 n=108; Victoria lineage n=24). One A(H1N1)pdm09 virus was identified as being highly resistant to oseltamivir due to the presence of the H275Y mutation.

One A(H3N2) virus was also identified with the S331R mutation that has been associated with reduced inhibition by oseltamivir and zanamivir. No genotypic susceptibility was identified in any genetically characterised B(Victoria) viruses.

Susceptibility to Baloxavir marboxil was performed by analysis of the PA gene for 107 viruses (H3N2 n=53; H1N1pdm09 n=50; Victoria lineage n=4). No viruses with resistance mutations were detected. Analysis of all influenza A viruses for which M2 protein sequences were available had the S31N mutation conferring resistance to the adamantane group of antivirals. Moreover, one A(H1N1)pdm09 virus was identified as carrying an additional mutation that confers highly-reduced inhibition by adamantanes (L26I).

Figure 3.3.1. Prescribing rate for oseltamivir per 100,000 practice population in Wales from 2019 week 40 to 2023 week 15 (arrows indicate when antiviral licensing triggers were issued, in line with NICE guidance)

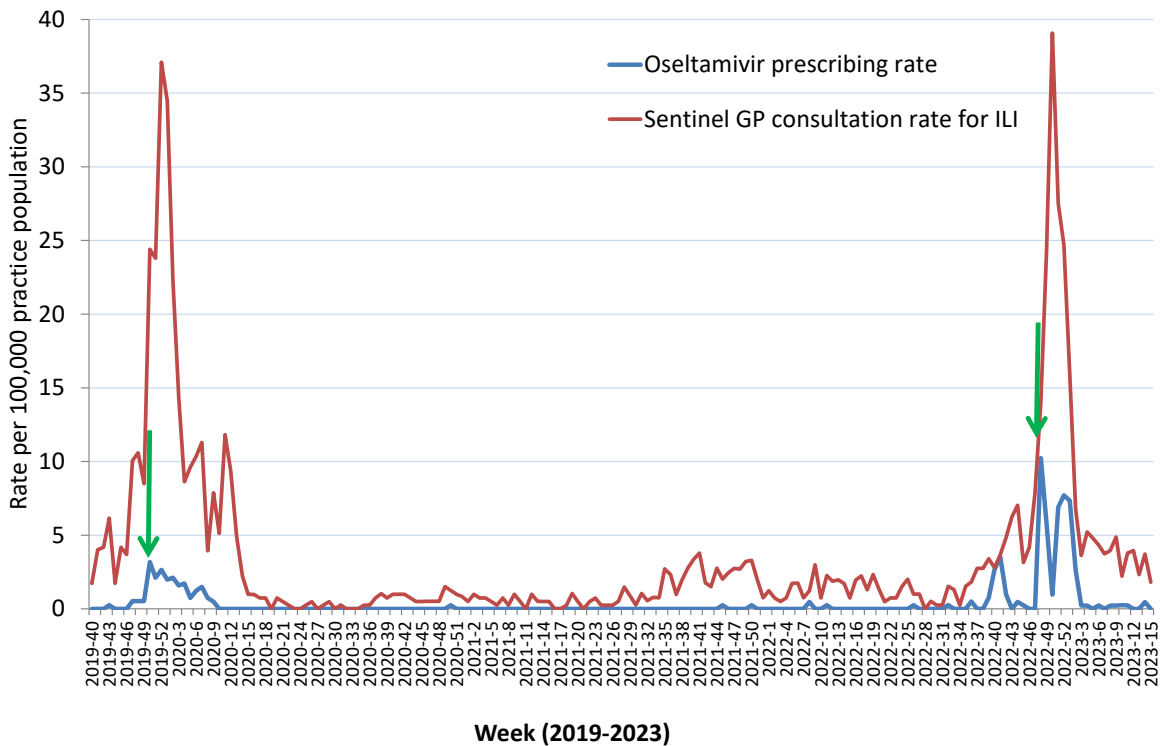


Table 3.3.1. Peak sentinel GP consultation rates for ILI per 100,000 practice population and peak all Wales prescribing rates per 100,000 for influenza seasons from 2010/11 to 2022/23

Influenza Season	Peak sentinel GP ILI consultation rate	Peak all Wales GP oseltamivir prescribing rate
2010/11	92.2	12.4
2011/12	10.4	1.0
2012/13	33.0	0.8
2013/14	8.8	0.2
2014/15	23.2	3.0
2015/16	25.8	1.1
2016/17	22.8	3.4
2017/18	74.5	9.5
2018/19	22.9	5.5
2019/20	37.1	3.2
2020/21	1.5	0.3
2021/22	3.8	0.5
2022/23	39.1	10.2

4. Influenza immunisation in Wales 2022/23

4.1 Data collection

4.1.1 Primary Care data

Data on influenza immunisation for the 2022/23 campaign were collected directly from GP IT systems using the Audit+ Data Quality System. Audit+ interrogates GP systems using specified Read codes and automatically relays the relevant anonymous aggregate data to a central database on a weekly basis. This provides the information required to monitor uptake of influenza immunisation in Wales, whilst minimising impact on GPs. Data were collected on immunisations given and recorded on GP systems between 3rd October 2022 and 25th April 2023.

If data from individual General Practices were not received for a particular week, the most recent submission of data from the relevant practice was identified and used. This report is based on data submitted from all 384 practices in Wales.

Data were collected on immunisations given to those aged 50 years and older, those aged between six months and 49 years recorded as belonging to one or more clinical risk group (in total and by specific risk group) and children aged two to three years (age on 31st August 2022). Immunisation uptake figures for pregnant women calculated from practice data represent the proportion of women whose practice records contained Read codes associated with pregnancy at any point during September 2022 to January

2023 who had received an influenza vaccine since 1st September 2022. Risk categories were based on the Read and SNOMED code groups defined in the [PRIMIS Seasonal Influenza Vaccine Uptake Reporting Specification for 2022/23](#) [6].

4.1.2 Point of delivery survey data of coverage in pregnant women

During January 2023 a survey was conducted with Heads of Midwifery and midwifery colleagues in all Welsh health boards on how many women delivering in the major maternity units recalled being offered influenza immunisation, and how many recalled receiving it [7]. During the five-day period, information was collected from 345 women giving birth. This is the ninth year the point of delivery survey has been conducted across maternity units in Wales.

4.1.3 Nursery, Reception class to School Year 6 classes (children aged four to 10 years) data

Data on uptake of Live Attenuated Influenza Vaccine (LAIV) in schoolchildren in reception class and in school years 1 to 11 (children aged four to 15 years of age as at 31st August 2022) were manually submitted by health board Immunisation Coordinators on a fortnightly basis throughout the campaign through an online data reporting survey hosted on SmartSurvey. Uptake figures represent the proportion of children that received LAIV at a school immunisation sessions. Data on uptake of LAIV in three year old children in nursery classes in Cwm Taf Morgannwg UHB were also manually submitted by the health board throughout the campaign as part of a nursery school based influenza immunisation programme. Children not attending school and children who were vaccinated in primary care are not included in the data used to calculate uptake in these age groups to avoid double counting of children recorded as vaccinated in both school and general practice datasets.

4.1.4 NHS staff data

Immunisation uptake data for NHS staff employed by health boards and trusts were provided on a monthly basis from October 2022 to March 2023 by health board and trust occupational health departments. Denominator data were sourced at the start of the campaign from health boards and trusts using Electronic Staff Record (ESR) staff groupings. In Wales all NHS staff are offered influenza immunisation, however the approach to offering influenza immunisation to staff not normally considered to have direct patient contact may vary between health boards and trusts. Data provided relates to immunisations given to all staff and staff with direct patient contact which are calculated by aggregating data for ESR staff-groups which would normally have direct contact with patients.

4.1.5 Pharmacy data

Immunisations given in community pharmacies are recorded in the Choose Pharmacy data system. This is an anonymised dataset that provides information on location and health board of the pharmacy; eligibility of the patient and date of vaccination. This data provides a detailed breakdown of carers, however accurate equivalent denominators are not currently available, so it is not possible to calculate uptake. A number of pharmacy vaccinations may also be recorded in general practice systems, so it is not possible to add the number of pharmacy vaccinations to the number of general practice vaccinations as some patients may be double-counted.

4.2 Influenza immunisation uptake

4.2.1 Uptake in children

Of a total of 62,602 children aged two and three years old (as at 31 August 2022), 43.8% (n=27,433) were immunised against influenza in general practice between 1st September 2022 and 25th April 2023. The number of immunisations given to children aged two and three years old in general practice decreased by 3,420 in 2022/23 compared to 2021/22. Uptake in two and three year olds varied by health board, ranging from 38.8% (Swansea Bay UHB) to 52.5% (Powys Teaching HB). Uptake in three year olds (44.7%) was higher compared to uptake in two year olds (42.9%) (Table 4.2.1).

Table 4.2.1. Uptake of influenza immunisation in general practice in children aged two and three years by health board, Wales, 2022/23¹

Health Board	Children aged 2 years			Children aged 3 years			Combined Uptake (%)
	Immunised (n)	Denominator (n)	Uptake (%)	Immunised (n)	Denominator (n)	Uptake (%)	
Aneurin Bevan UHB	2957	6257	47.3	3060	6439	47.5	47.4
Betsi Cadwaladr UHB	2715	6489	41.8	2865	6643	43.1	42.5
Cardiff and Vale UHB	2284	5223	43.7	2337	5326	43.9	43.8
Cwm Taf UHB	2005	4651	43.1	2328	4805	48.4	45.8
Hywel Dda UHB	1289	3357	38.4	1454	3580	40.6	39.5
Powys Teaching HB	587	1156	50.8	661	1222	54.1	52.5
Swansea Bay UHB	1349	3601	37.5	1542	3853	40.0	38.8
Wales	13186	30734	42.9	14247	31868	44.7	43.8

¹Children aged three years from Cwm Taf Morgannwg UHB were offered influenza immunisation in nurseries attached to primary schools. Data presented in Table 4.2.1 are provided by general practices and it is likely information for a small proportion of children immunised in nursery sessions in Cwm Taf Morgannwg UHB was not entered into GP records. As a result, uptake presented here for three year olds in Cwm Taf Morgannwg UHB is likely to underestimate true uptake (see Table 4.2.2 for further information).

In Cwm Taf Morgannwg UHB, LAIV was offered to children aged three years old in nursery classes attached to primary schools. Uptake in this group of children was 50.6% (Table 4.2.2), a decrease from 61.9% in 2021/22 in this same age group. Of a total of 4,805 three year old children registered with a GP in Cwm Taf Morgannwg UHB, 3,096 (64.4%) were recorded in the nursery school data

Table 4.2.2. Uptake of influenza immunisation in children aged three years in nursery classes in Cwm Taf Morgannwg UHB, 2022/23

Health Board	Schools targeted (n)	Children aged 3 years (Nursery classes)		
		Immunised (n)	Denominator (n)	Uptake (%)
Cwm Taf Morgannwg UHB	119	1567	3096	50.6

LAIV was offered in 1,325 primary schools in Wales to children in reception class, and School Years 1 to 6. Of the 233,339 eligible children who were aged four to 10 years on 31st August 2022, 63.8% (148,979) were immunised against influenza. This decreased compared to 68.7% in 2021/22 in eligible children immunised in schools. Uptake ranged by HB from 57.2% (Cardiff and Vale UHB) to 75.3% (Betsi Cadwaladr UHB) (Table 4.2.3).

Uptake in school reception classes (children four to five years of age) decreased to 62.7% (19,300/30,773) from 67.5% in the same age group last year. Uptake varied by HB, ranging from 55.2% (Aneurin Bevan UHB) to 75.2% (Betsi Cadwaladr UHB) (Table 4.2.4).

Uptake in School Year 1 (children five to six years of age) decreased to 65.0% (20,524/31,583) from 69.5% in the same age group last year. Uptake varied by HB, ranging from 56.7% (Cardiff and Vale UHB) to 78.3% (Betsi Cadwaladr HB) (Table 4.2.4).

Uptake in School Year 2 (children six to seven years of age) decreased to 65.1% (21,379/32,838) from 69.7% in the same age group last year. Uptake varied by HB, ranging from 59.7% (Cardiff and Vale UHB) to 76.0% (Powys Teaching HB) (Table 4.2.4).

Uptake in School Year 3 (children seven to eight years of age) decreased to 64.2% (21,225/33,059) from 69.1% in the same age group last year. Uptake varied by HB, ranging from 57.4% (Cardiff and Vale UHB) to 84.0% (Hywel Dda UHB) (Table 4.2.4).

Uptake in School Year 4 (children eight to nine years of age) decreased to 64.5% (21,462/33,265) from 69.2% in the same age group last year. Uptake varied by HB, ranging from 56.0% (Cardiff and Vale UHB) to 76.1% (Betsi Cadwaladr UHB) (Table 4.2.4).

Uptake in School Year 5 (children nine to 10 years of age) decreased to 63.9% (21,673/33,901) from 68.2% in the same age group last year. Uptake varied by HB, ranging from 55.1% (Cardiff and Vale UHB) to 75.2% (Betsi Cadwaladr UHB) (Table 4.2.4).

Uptake in School Year 6 (children 10 to 11 years of age) decreased to 62.7% (21,849/34,824) from 67.8% in the same age group last year. Uptake varied by HB, ranging from 55.9% (Aneurin Bevan UHB) to 73.8% (Betsi Cadwaladr UHB) (Table 4.2.4).

Table 4.2.3. Uptake of influenza immunisation in primary school children by health board, Wales, 2022/23

Health Board	Schools Targeted (n)	All children aged 4 to 10 years		
		Immunised (n)	Denominator (n)	Uptake (%)
Aneurin Bevan UHB	207	27478	47146	58.3
Betsi Cadwaladr UHB	337	31477	41784	75.3
Cardiff and Vale UHB	160	22604	39521	57.2
Cwm Taf Morgannwg UHB	178	24249	40814	60.1
Hywel Dda UHB	199	19165	27616	69.4
Powys Teaching HB	103	5723	7877	72.7
Swansea Bay UHB	141	18283	28581	64.0
Wales	1325	148979	233339	63.8

Table 4.2.4. Uptake of influenza immunisation in school children aged four to ten years by health board, Wales, 2022/23

Health Board	Schools targeted (n)	School children aged:						
		4 years Uptake (%)	5 years Uptake (%)	6 years Uptake (%)	7 years Uptake (%)	8 years Uptake (%)	9 years Uptake (%)	10 years Uptake (%)
Aneurin Bevan UHB	207	55.2	59.3	60.9	58.5	59.0	59.1	55.9
Betsi Cadwaladr UHB	337	75.2	78.3	74.2	74.7	76.1	75.2	73.8
Cardiff and Vale UHB	160	58.2	56.7	59.7	57.4	56.0	55.1	57.4
Cwm Taf Morgannwg UHB	178	60.2	62.6	60.4	59.7	61.3	57.8	59.3
Hywel Dda UHB	199	66.6	68.6	70.1	68.9	71.5	70.2	69.6
Powys Teaching HB	103	64.1	75.5	76.0	84.0	70.6	73.0	67.2
Swansea Bay UHB	141	62.5	63.2	64.9	65.0	63.9	67.2	61.3
Wales	1325	62.7	65.0	65.1	64.2	64.5	63.9	62.7

This influenza season LAIV was offered in 274 secondary schools in Wales to children in School Years 7 to 11. Of the 172,630 eligible children who were aged 11 to 15 years on 31st August 2022, 54.4% (93,936) were immunised against influenza. Uptake ranged by HB from 41.6% (Cardiff and Vale UHB) to 68.9% (Powys Teaching HB) (Table 4.2.5).

Uptake in School Year 7 (children 11 to 12 years of age) was 62.3% (22,887/35,764). Uptake varied by HB, ranging from 47.1% (Cardiff and Vale UHB) to 73.6% (Betsi Cadwaladr UHB) (Table 4.2.6).

Uptake in School Year 8 (children 12 to 13 years of age) was 55.3% (19,333/34,977). Uptake varied by HB, ranging from 43.3% (Cardiff and Vale UHB) to 66.4% (Powys Teaching HB) (Table 4.2.6).

Uptake in School Year 9 (children 13 to 14 years of age) was 52.9% (18,133/34,308). Uptake varied by HB, ranging from 39.7% (Cardiff and Vale UHB) to 64.3% (Powys Teaching HB) (Table 4.2.6).

Uptake in School Year 10 (children 14 to 15 years of age) was 51.4% (17,736/34,533). Uptake varied by HB, ranging from 39.2% (Cardiff and Vale UHB) to 83.2% (Powys Teaching HB) (Table 4.2.6).

Uptake in School Year 11 (children 15 to 16 years of age) was 49.8% (16,447/33,048). Uptake varied by HB, ranging from 38.0% (Cardiff and Vale UHB) to 62.4% (Powys Teaching HB) (Table 4.2.6).

Table 4.2.5. Uptake of influenza immunisation in secondary school children by health board, Wales, 2022/23

Health Board	Schools Targeted (n)	All children aged 11 to 15 years		
		Immunised (n)	Denominator (n)	Uptake (%)
Aneurin Bevan UHB	38	18574	34517	53.8
Betsi Cadwaladr UHB	70	19305	30417	63.5
Cardiff and Vale UHB	43	12135	29177	41.6
Cwm Taf Morgannwg UHB	41	13893	29462	47.2
Hywel Dda UHB	38	13049	21044	62.0
Powys Teaching HB	12	4423	6423	68.9
Swansea Bay UHB	32	12557	21590	58.2
Wales	274	93936	172630	54.4

Table 4.2.6. Uptake of influenza immunisation in school children aged 11 to 15 years by health board, Wales, 2022/23

Health Board	Schools targeted (n)	School children aged:				
		11 years Uptake (%)	12 years Uptake (%)	14 years Uptake (%)	14 years Uptake (%)	15 years Uptake (%)
Aneurin Bevan UHB	38	62.5	51.5	48.9	47.0	59.5
Betsi Cadwaladr UHB	70	73.6	66.1	63.4	59.6	54.0
Cardiff and Vale UHB	43	47.1	43.3	39.7	39.2	38.0
Cwm Taf Morgannwg UHB	41	55.1	49.5	47.9	44.6	38.3
Hywel Dda UHB	38	70.0	64.1	61.9	59.5	54.1
Powys Teaching HB	12	70.8	66.4	64.3	83.2	62.4
Swansea Bay UHB	32	67.0	58.5	57.5	56.0	51.1
Wales	274	62.3	55.3	52.9	51.4	49.8

Uptake in children at risk aged two to three years was 51.1% and ranged by health board from 41.7% (Hywel Dda UHB) to 54.9% (Powys Teaching HB). Uptake in children at risk aged four to 10 years was 33.7% and ranged by health board from 11.8% (Cardiff and Vale UHB) to 64.1% (Powys THB). Uptake in children at risk aged 11 to 17 years was 29.4% and ranged by health board from 17.5% (Cardiff and Vale UHB) to 39.2% (Swansea Bay UHB) (Table 4.2.5). The proportion of children in a risk group vaccinated aged four to 10 years and 11 to 17 years may be higher as some vaccinations given in school sessions will not be recorded on the child's General Practice record.

Table 4.2.7. Uptake of influenza immunisation in children aged two to seventeen with a risk condition by health board, Wales, 2022/23^{1,2,3}

Health Board	Children aged 2-3 years			Children aged 4-10 years			Children aged 11-17 years		
	Immunised (n)	Denominator (n)	Uptake (%)	Immunised (n)	Denominator (n)	Uptake (%)	Immunised (n)	Denominator (n)	Uptake (%)
Aneurin Bevan UHB	272	492	55.3	484	3512	13.8	798	3948	20.2
Betsi Cadwaladr UHB	220	417	52.8	1575	3705	42.5	1694	4570	37.1
Cardiff and Vale UHB	177	334	53.0	354	2992	11.8	627	3584	17.5
Cwm Taf Morgannwg UHB	201	400	50.3	1414	2965	47.7	1264	3279	38.5
Hywel Dda UHB	78	187	41.7	860	1793	48.0	609	2485	24.5
Powys Teaching HB	45	82	54.9	411	641	64.1	314	806	39.0
Swansea Bay UHB	97	221	43.9	718	1625	44.2	748	1907	39.2
Wales	1090	2133	51.1	5816	17233	33.7	6054	20579	29.4

¹Age as at 31/08/2022.

² Data from Audit+

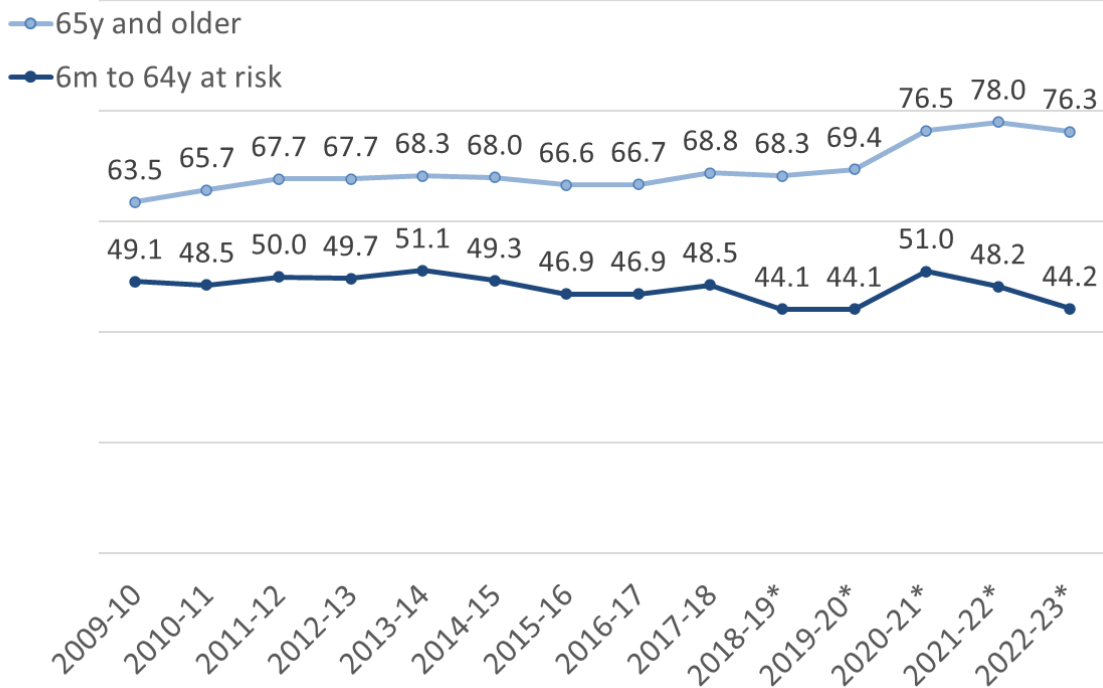
³All children aged four to 15 years are eligible for immunisation through school vaccination sessions. Data presented here for four to 10 year olds and 11 to 17 year olds in clinical risk groups show the numbers of patients at clinical risk, whose GP record contains appropriate influenza vaccination Read codes; and is likely to underestimate true uptake in the group.

4.2.2 Uptake in those aged 65 years and older and aged six months to 64 years in clinical risk groups

Uptake of influenza vaccine in those aged 65 years and older was 76.3%, a decrease compared to 78.0% in the 2021/22 season (Figure 4.2.1). Of all influenza immunisations given to those aged 65 years and over, 90% were delivered by the week ending 20th November 2022 (Figure 4.2.2). Uptake varied by HB from 73.5% (Hywel Dda UHB) to 78.4% (Betsi Cadwaladr UHB), (Table 4.2.6, Figure 4.2.3) and ranged by Local Authority (LA) area from 70.2% (Merthyr Tydfil) to 84.1% (Monmouthshire) (Appendix Table A1). For patients aged 65 years or older, 10.3% were recorded as having declined immunisation, compared to 6.7% in the 2021/22 season. Four HBs and 16 LA areas achieved the 75% ambition.

Uptake in those aged six months to 64 years in a clinical risk group was 44.2%, a decrease compared to 48.2% in the 2021/22 season (Figure 4.2.1). Of all immunisations given to those aged six months to 64 years in clinical risk groups, 90% were delivered by the week ending 18th December 2022 (Figure 4.2.2). Uptake ranged by HB from 39.7% (Cardiff and Vale UHB) to 47.4% (Aneurin Bevan UHB) (Table 4.2.6, Figure 4.2.4) and by LA area from 39.6% (Vale of Glamorgan) to 57.3% (Monmouthshire) (Appendix Table A1). The proportion of all people aged six months to 64 years recorded in one or more clinical risk categories was 17.5% (an increase from 17.1% in 2021/22). Of those aged six months to 64 years in a clinical risk group, 10.2% were recorded as having declined immunisation, compared to 8.1% in 2021/22.

Figure 4.2.1. Annual trends in influenza immunisation uptake (%) in those aged 65 years and over and in those aged six months to 64 years in clinical risk groups, Wales, 2009/10 – 2022/23



*Data for those aged six months to 64 years at risk includes those morbidly obese not otherwise at risk. Prior to 2018/19 this group were not included in the overall uptake figures for this category.

Figure 4.2.2. Weekly trend in uptake of influenza vaccine in patients aged 65 years and over and in those aged six months to 64 years in clinical risk groups, Wales, 2021/22 and 2022/23

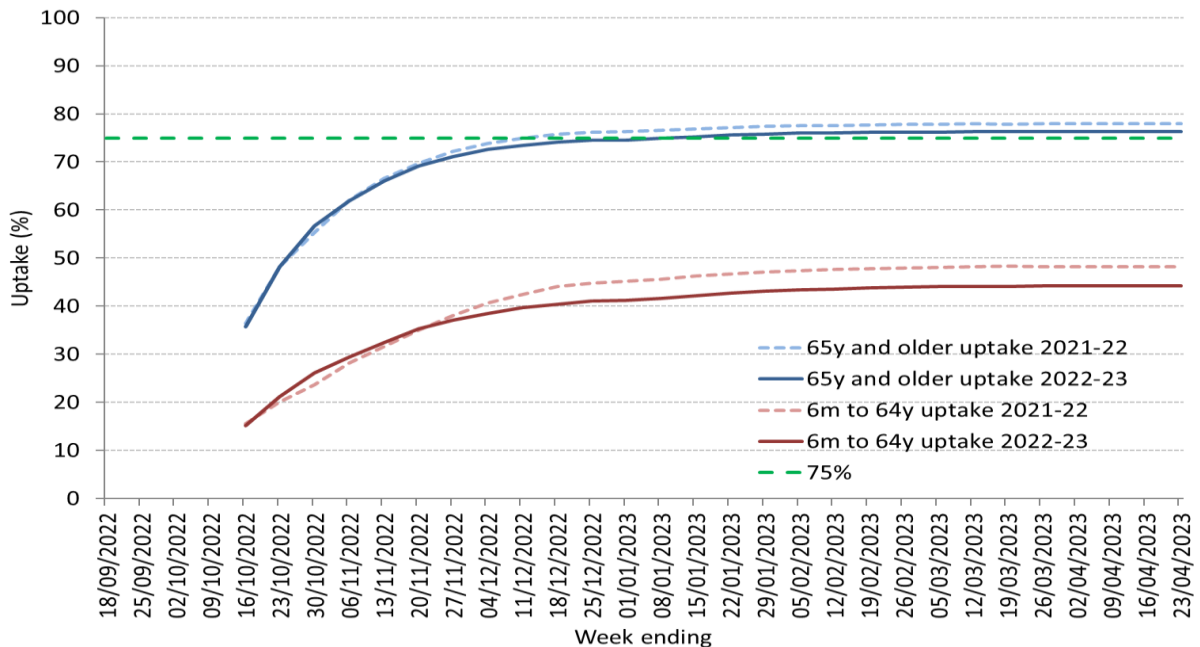


Table 4.2.8. Trends in uptake (%) of influenza immunisation in health boards, Wales, 2019/20 – 2022/23

Health Board	Uptake in patients aged 65y and older				Uptake in patients younger than 65y at risk			
	2019/20	2020/21	2021/22	2022/23	2019/20	2020/21	2021/22	2022/23
Aneurin Bevan UHB	70.8	78.3	80.0	78.2	46.5	54.6	53.6	47.4
Betsi Cadwaladr UHB	71.4	78.2	79.8	78.4	46.9	54.2	51.0	47.0
Cardiff and Vale UHB	71.2	77.4	76.1	75.7	43.8	48.3	41.9	39.7
Cwm Taf Morgannwg UHB	68.9	75.4	76.7	74.9	40.3	46.3	43.2	42.3
Hywel Dda UHB	64.8	73.6	75.9	73.5	40.2	49.8	47.5	41.8
Powys Teaching UHB	67.1	73.5	75.3	73.8	44.3	52.2	50.9	47.2
Swansea Bay UHB	68.1	75.5	78.5	75.9	44.0	49.4	48.8	43.8
Wales	69.4	76.5	78.0	76.3	44.1	51.0	48.2	44.2

Figure 4.2.3. Uptake of influenza immunisation in health boards in Wales in patients aged 65 years and over, 2019/20 – 2022/23

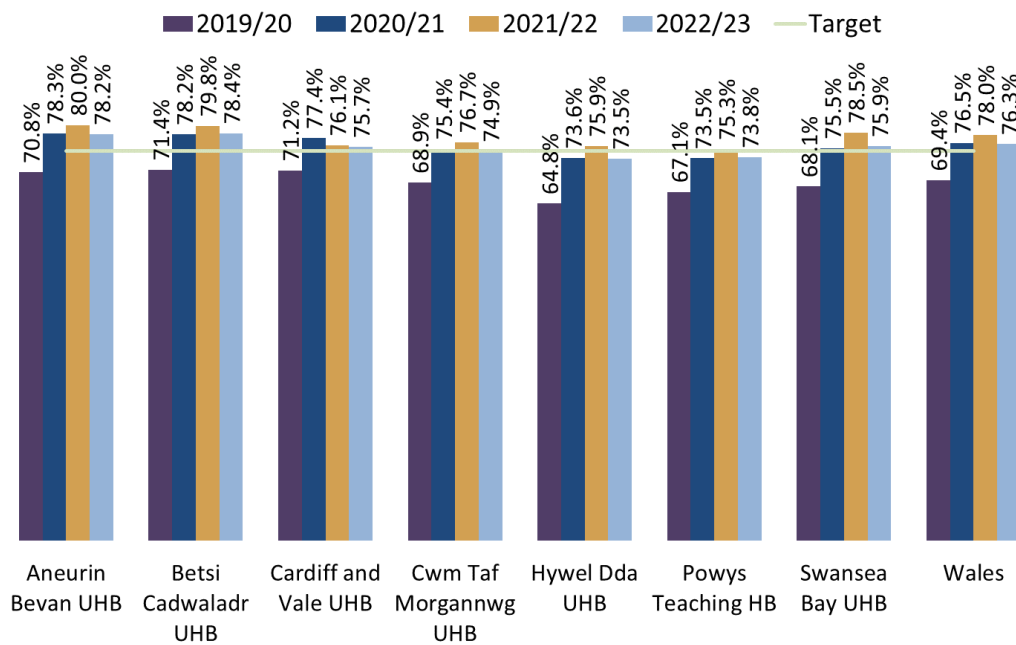
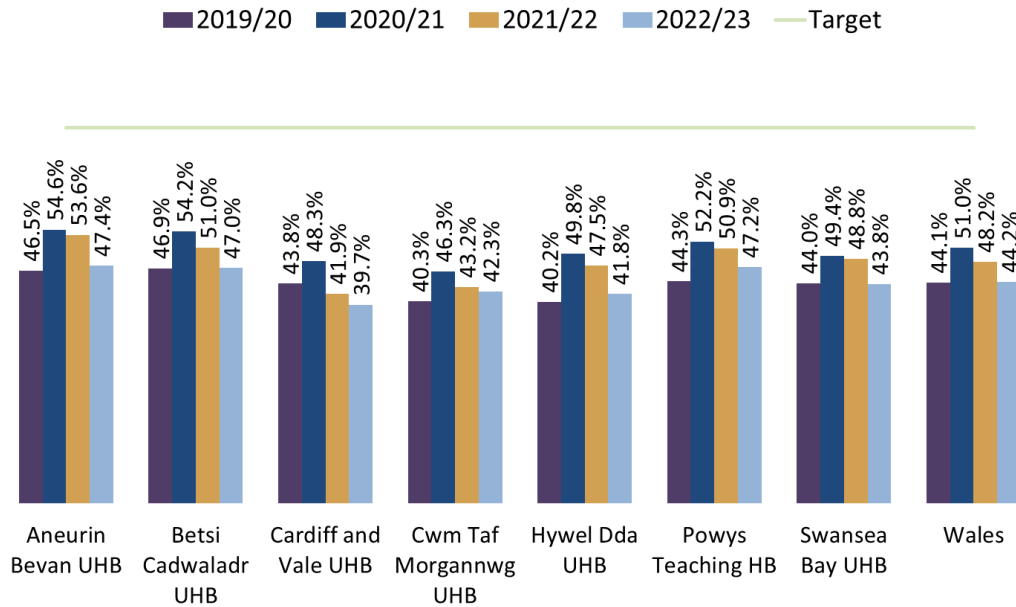


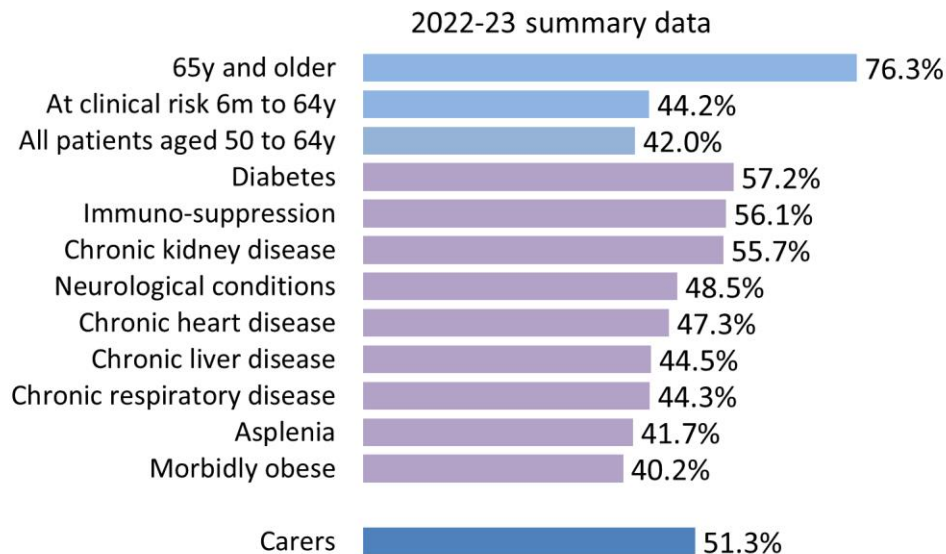
Figure 4.2.4. Uptake of influenza immunisation in health boards in Wales in patients aged six months to 64 years in clinical risk groups, 2019/20 – 2022/23



4.2.3 Immunisation uptake by risk group

Vaccine uptake in those aged six months to 64 years in a clinical risk group was 44.2%. Many people will have more than one clinical risk, for example, a patient may suffer from both diabetes and chronic heart disease, therefore the same patient may be represented in the uptake figures for more than one risk group. However, a patient will only be counted once in the overall total uptake figure of 44.2% for those aged six months to 64 years in a clinical risk group, irrespective of how many clinical risk conditions they suffer from. Numbers of individuals coded as being in each clinical risk group can be found in appendix Table A2.

Figure 4.2.5. *Influenza immunisation uptake rates in patients aged 65 years and over and six months to 64 years at risk, by individual risk group, Wales, 2022/23*



- Chronic heart disease was recorded in 2.8% of patients aged six months to 64 years, of whom 47.3% were immunised against influenza (Figure 4.2.5, Appendix Table A2). Uptake by HB ranged from 41.2% (Cardiff and Vale UHB) to 50.9% (Aneurin Bevan UHB).
- Chronic respiratory disease was recorded in 7.6% of patients aged six months to 64 years, of whom 44.3% were immunised against influenza (Figure 4.2.5, Appendix Table A2), ranging by HB from 39.8% (Cardiff and Vale UHB) to 48.8% (Powys Teaching HB). At Wales level, 57.4% of those with COPD were immunised against influenza, whilst 43.4% of those with asthma and 49.8% of those with non-asthma non-COPD respiratory were immunised against influenza.
- Chronic kidney disease was recorded in 0.5% of patients aged six months to 64 years, of whom 55.7% were immunised against influenza (Figure 4.2.5, Appendix Table A2), ranging by HB from 51.1% (Cardiff and Vale UHB) to 59.5% (Aneurin Bevan UHB).
- Diabetes was recorded in 3.7% of patients aged six months to 64 years, of whom 57.2% were immunised against influenza (Figure 4.2.5, Appendix Table A2), ranging by HB from 52.8% (Hywel Dda UHB) to 60.7% (Aneurin Bevan UHB).
- Immunosuppression due to disease or treatment was recorded in 1.0% of patients aged six months to 64 years, of whom 56.1% were immunised against influenza (Figure 4.2.5, Appendix Table A2), ranging by HB from 50.8% (Swansea Bay UHB) to 60.9% (Aneurin Bevan UHB).
- Chronic liver disease was recorded in 0.5% of patients aged six months to 64 years, of whom 44.5% were immunised against influenza (Figure 4.2.5, Appendix Table A2), ranging by HB from 39.5% (Cardiff and Vale UHB) to 50.3% (Powys Teaching HB).
- Chronic neurological conditions (including stroke and TIA) were recorded in 1.4% of patients aged six months to 64 years, of whom 48.5% were immunised against influenza (Figure 4.2.5, Appendix Table A2), ranging by HB from 43.0% (Cardiff and Vale UHB) to 53.4% (Aneurin Bevan UHB).
- Morbidly obese was recorded in 3.6% of patients aged 18 to 64 years (eligible age group for this clinical risk group), of whom 40.2% were immunised against influenza (Figure 4.2.5, Appendix

Table A2). Uptake ranged by HB from 35.7% (Cardiff and Vale UHB) to 45.0% (Aneurin Bevan UHB).

- Being asplenic (or having a dysfunctional spleen) was recorded in 0.5% of patients aged six months to 64 years, of whom 41.7% were immunised against influenza (Figure 4.2.5, Appendix Table A2), ranging by HB from 36.5% (Cardiff and Vale UHB) to 44.6% (Aneurin Bevan UHB & Betsi Cadwaldr UHB).
- A total of 46,732 people aged six months to 64 years were recorded as being a carer (including carers who are also in a clinical risk group), of whom 51.3% were immunised against influenza (Figure 4.2.5, Appendix Table A4). These figures only include those who have identified themselves as a carer to their GP, and have been coded appropriately in the GP records; the true denominator for carers is likely to be higher. Uptake ranged by HB from 46.4% (Cardiff and Vale UHB) to 57.3% (Aneurin Bevan UHB).

4.2.4 Uptake in pregnant women

Coverage of influenza vaccination in pregnant women was measured using two methods:

1. A five-day survey carried out with health board midwifery services in major maternity units across Wales, ascertaining self-reported vaccination status for the women delivering during the survey period. Ascertainment of pregnancy status is more robust using this method. However, the survey does not capture information on women whose pregnancies ended with outcomes other than a birth in a major maternity unit.
2. Weekly collections of data from GPs using Audit+. This method provides timely data on immunisations given to pregnant women, however ascertaining pregnancy status using Read codes in GP data systems can be problematic and results in underestimation of uptake in this group.

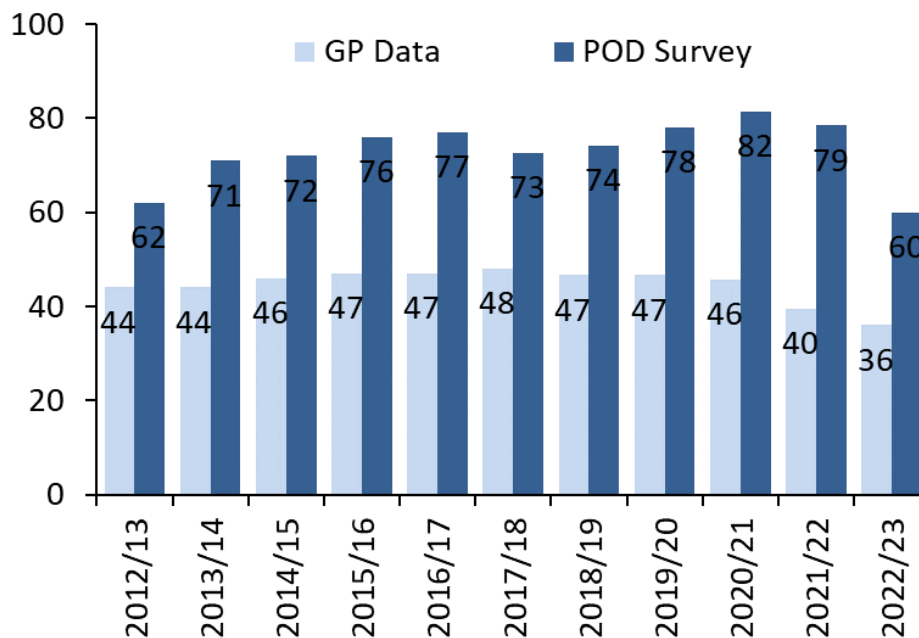
From 1st September 2022 to 31st January 2023, 19,423 women were coded in General Practice with Read codes associated with pregnancy. Out of these women, 2,316 (11.9%) had an existing risk (as defined by the CMO letter [1]), the remainder (17,107) did not have another identified clinical risk (Appendix Table A3). Uptake of influenza vaccination in all pregnant women, measured using GP data was 35.7% and ranged by HB from 32.8% (Hywel Dda UHB) to 39.9% (Powys THB). Uptake in pregnant women with another existing risk condition was 46.7% and ranged by HB from 40.9% (Hywel Dda UHB) to 54.6% (Powys THB). Uptake in pregnant women without another existing risk condition was 34.2% and ranged by HB from 31.6% (Hywel Dda UHB) to 37.9% (Powys THB).

The point of delivery (POD) survey included 345 women giving birth during a five-day period in February 2023 [7]. Data were submitted by all health boards in Wales. Uptake of influenza immunisation recalled in this group was 60.0% (95% CI 54.6-65.2), a decrease compared to 78.5% (95% CI 74.1%-82.5%) last year and below the 90% vaccination ambition set by Welsh Government. Uptake increased in one HB (Powys THB) compared to the 2021/22 survey, and decreased in the remaining six HBs [7]. The survey also found that 93.3% of the women could recall being offered influenza immunisation, a decrease of 3.6% from last year (Table 4.2.7 and Figure 4.2.8). The estimates using GP data are uniformly lower than those estimated using the survey at the point of delivery (Figure 4.2.6).

Table 4.2.9. Number of women offered influenza vaccine during pregnancy, Wales, 2022/23 (Data source: 2022/23 point of delivery survey)

Offered influenza vaccination while pregnant	Number of women (n)	Percentage (%)
Yes	322	93.3%
No	19	5.5%
Not sure/missing	4	1.2%
Total	345	100%

Figure 4.2.6. Uptake (%) of influenza vaccination in pregnant women by data source, Wales, 2012/13-2022/23



Although there may be problems with ascertainment of the percentage uptake, data provided by GPs on uptake in pregnancy are still useful in estimating and monitoring the number of pregnant women in Wales who have received influenza vaccination each season. During the 2022/23 winter, 6,941 women whose GP record contained Read codes relating to pregnancy were recorded as having received influenza vaccination. This is a decrease from the 2021/22 total of 8,349 women vaccinated.

4.2.5 Estimated numbers of individuals immunised in Wales in 2022/23

The estimated total number of individuals recorded by their general practice as immunised against influenza was 1,063,495 as at 25th April 2023, based on Read coded data reported from all practices in Wales for 2022/23. This represents an estimated 34% of the population of Wales.

This includes 525,902 individuals aged 65 years and over, 284,258 individuals aged 50 to 64 years, 74,483 aged six months to 49 years in a clinical risk group, 5,859 pregnant women without clinical risk, 27,433 children aged two and three years and 23,967 carers. Vaccinated individuals are ascertained using Read codes which correspond to eligibility criteria [6].

The remaining 121,593 immunisations were likely received by:

- Patients aged younger than 50 years who did not have Read codes attached to their GP records which are recommended for use in surveillance of influenza immunisation uptake in risk groups who were regarded as at risk by GPs based on clinical judgement.
- Those in long-stay residential homes who are not aged 50 years or older, and not in a clinical risk group.
- Patients immunised by other service providers, for example occupational health departments and school nursing services, whose GPs were notified and whose records were updated with appropriate vaccination Read codes.

The estimated total of 1,063,495 individuals immunised in 2022/23 is a decrease on the estimated 1,117,184 individuals immunised during the 2021/22 influenza immunisation campaign. These estimates are based on data recorded by general practices, the actual number of individuals immunised against influenza in Wales will be higher as not all immunisations given by other service providers will be recorded in general practice databases. In addition, the extent to which immunisations given in community pharmacies are recorded using Read codes in GP patient databases is unknown; these vaccinations may be under-reported in uptake figures calculated using GP data.

4.2.6 Uptake in NHS staff in Wales

All health boards and NHS trusts in Wales provided NHS staff immunisation uptake data. Uptake in staff groups expected to have direct patient contact was 46.7% (n=29,146) (Table 4.2.10). Uptake in staff with direct patient contact ranged by organisation from 38.4% (Cardiff and Vale UHB) to 57.0% (Aneurin Bevan UHB and Velindre NHS Trust). Uptake in staff groups ranged from 38.4% (Estates and Ancillary) to 58.7% (Medical and Dental) (Table 4.2.11).

There were a total of 96,504 NHS health board or trust staff reported under the care of NHS Occupational Health departments in Wales and offered influenza vaccination, of whom 46.0% (n=44,430) were immunised during 2022/23, a decrease of 9.7 from 55.7% in 2021/22. Uptake has increased in ten of the thirteen years since 2009/10 (11.6%). Uptake in all staff ranged by organisation from 37.9% (Cardiff and Vale UHB) to 55.4% (Velindre NHS Trust). Powys Teaching HB and Welsh Ambulance Service NHS Trust showed an increase in uptake compared to the previous season (Figure 4.2.7).

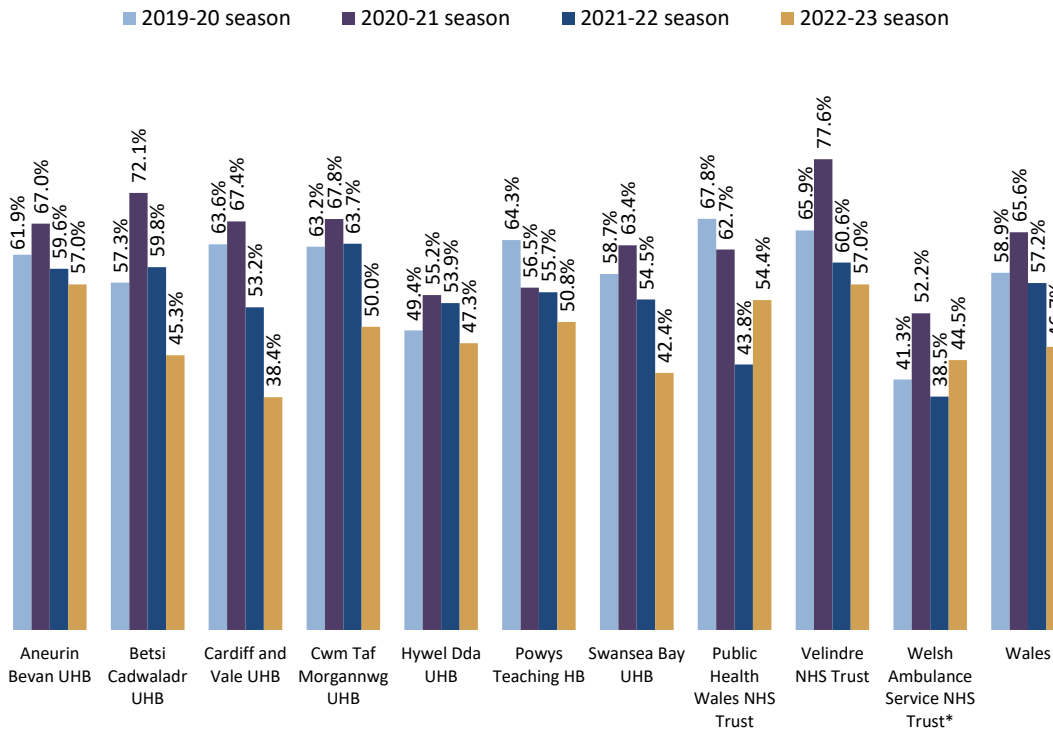
Uptake of influenza vaccination in staff with direct patient contact did not exceed the Welsh Government ambition of 80% in any Health Board or NHS Trust (Table 4.2.10).

Table 4.2.10. Uptake of influenza immunisation in NHS staff in Wales, 2022/23

Health Board/Trust	Total Staff			Staff with direct patient contact ¹		
	Immunised (n)	Denominator (n)	Uptake (%)	Immunised (n)	Denominator (n)	Uptake (%)
Aneurin Bevan UHB	7585	13852	54.8	5299	9293	57.0
Betsi Cadwaladr UHB	8476	19348	43.8	6092	13435	45.3
Cardiff and Vale UHB	6223	16435	37.9	4434	11542	38.4
Cwm Taf Morgannwg UHB	6153	12472	49.3	4154	8310	50.0
Hywel Dda UHB	5292	11214	47.2	3618	7650	47.3
Powys Teaching HB	1088	2042	53.3	664	1308	50.8
Swansea Bay UHB	5556	12813	43.4	3724	8775	42.4
Velindre NHS Trust	917	1655	55.4	486	852	57.0
Welsh Ambulance Service NHS Trust	1890	4251	44.5	-	-	-
Public Health Wales NHS Trust	1250	2422	51.6	675	1240	54.4
Wales	44430	96504	46.0	29146	62405	46.7

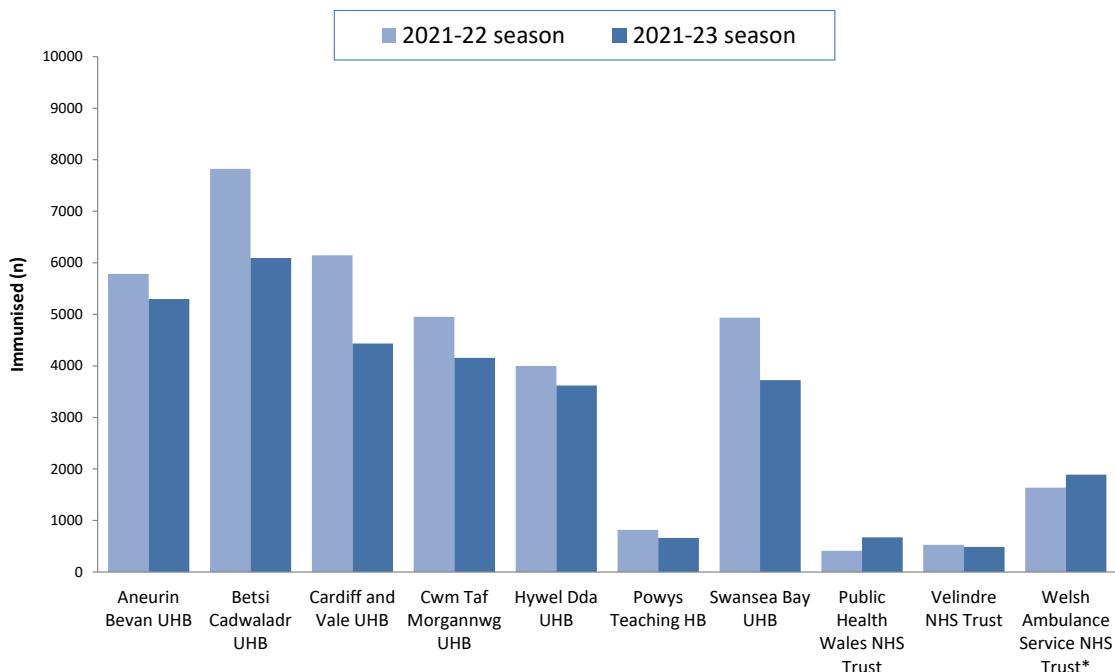
¹ Combined figures for: Additional Prof Scientific and Technical, Additional Clinical Services, Allied Health Professions, Medical and Dental, Nursing & Midwifery Registered staff groups.

Figure 4.2.7. Uptake of influenza immunisation in NHS staff with direct patient contact in Wales, 2019/20 – 2022/23



*All staff data used for Welsh Ambulance Service NHS Trust for 2021/22 and 2022/23

Figure 4.2.8. Number of influenza immunisations in Welsh Health Board & NHS Trust staff with direct patient contact – seasonal comparison 2021/22 and 2022/23.



*All staff data used for Welsh Ambulance Service NHS Trust for 2021/22

Table 4.2.11. Uptake of influenza immunisation in NHS staff groups, Wales, 2022/23

ESR staff group	Staff		
	Immunised (n)	Denominator (n)	Uptake (%)
Additional Clinical Services	7602	19156	39.7
Additional Prof Scientific and Technical	1747	3262	53.6
Administrative and Clerical	8608	18473	46.6
Allied Health Professionals	3421	6538	52.3
Estates and Ancillary	3121	8136	38.4
Healthcare Scientists	1090	2057	53.0
Medical and Dental	3207	5463	58.7
Nursing & Midwifery Registered	12494	26746	46.7

4.2.7 Immunisations given in community pharmacies

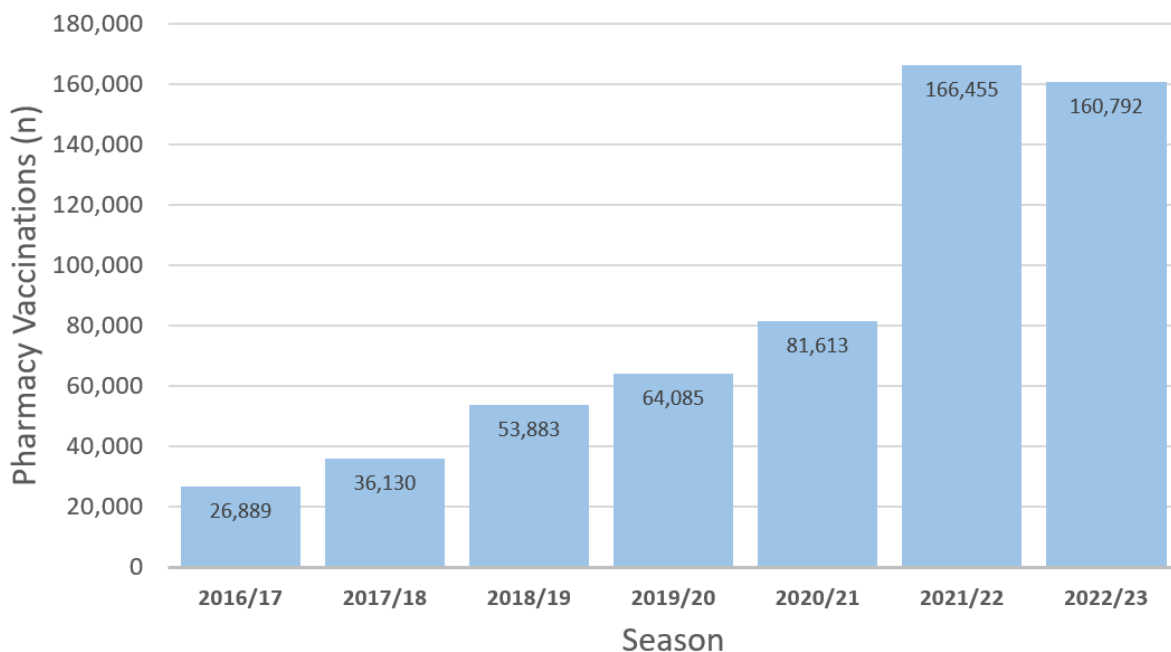
A total of 160,792 people were immunised against influenza in community pharmacies in Wales, as of 28th March 2023. This is a slight decrease compared to 166,455 immunisations given in 2021/22, as recorded in the NECAF system (Figure 4.2.11). The highest number of influenza immunisations given in

this setting was in Betsi Cadwaladr UHB (24.0%) whilst the lowest was in Powys Teaching HB (4.3%) (Table 4.2.10).

The majority of influenza immunisations given in community pharmacies were given to individuals aged 65 or over (40.8%); whilst 37.3% were given to individuals aged 50 to 64 years and 14.6% of immunisations were given to those in one or more clinical risk groups aged under 65. (Table 4.2.11). Of the influenza immunisations given to those in a risk group, the majority were given to individuals with chronic respiratory disease (45.2%) and individuals with diabetes (20.1%) (Table 4.2.12).

A total of 6,856 influenza immunisations were given to carers; 3.9% of all pharmacy immunisations; with 2,598 immunisations given to care home workers; 1,165 to domiciliary carers and 3,093 to unpaid carers (Table 4.2.14).

Figure 4.2.11. Influenza immunisations given in community pharmacies in Wales, 2016/17-2022/23*



Data for 2016/17-2019-20 was taken from the NECAF (National Electronic Claim and Audit Forms) data system, whilst from 2020/21 onwards, data was taken from the Choose Pharmacy system.

Table 4.2.10. Number of influenza immunisations given in community pharmacies in Wales, by health board of residence, 2022/23

Health Board	Immunised	
	(n)	(%)
Aneurin Bevan UHB	24,774	15.4
Betsi CadwaladrUHB	38,550	24.0
Cardiff and Vale UHB	23,951	14.9
Cwm Taf Morgannwg UHB	24,053	15.0
Hywel Dda UHB	20,316	12.6
Powys Teaching HB	6,990	4.3
Swansea Bay UHB	22,158	13.8
Wales	160,792	100.0

Table 4.2.11. Number of influenza immunisations given in community pharmacies, by eligibility group, 2022/23**Table 4.2.11.** Number of influenza immunisations given in community pharmacies, by eligibility group, 2022/23

Eligibility	Immunised in pharmacies		Total recorded as vaccinated in general practice databases (n) ¹	% of total vaccinations given through pharmacies ¹
	n	% of total pharmacy influenza vaccinations		
Aged 65 or over	72,635	40.8	525,902	13.8
Aged 50 to 64	66,373	37.3	284,258	23.3
Risk group aged under 65	25,918	14.6	200,211	12.9
Pregnancy	1,090	0.6	6,941	15.7
Learning Disability	545	0.3	-	-
Carer ²	3,093	1.7	23,967	12.9
Domiciliary Carer	1,165	0.7	-	-
Care Home Staff	2,598	1.5	-	-
Other ³	6,248	3.5	-	-
Total	178,030⁴	100.0		

¹ Completeness of reporting of pharmacy vaccinations to general practices and consistency of coding for pharmacy vaccinations in general practice databases are unknown. Due to this, the total number of individuals vaccinated may be an underestimate.

² Includes informal unpaid and voluntary sector unpaid carers.

³ Includes individuals who are categorised as: Community First Responder; Designated First Aider; Household contact of immunocompromised; Household contacts of people on the NHS Shielded List; Not in a risk group; People living in long-stay residential care homes or other long-stay care facilities; Third Sector Carer; Other (as specified in PGD).

Table 4.2.12. Number of influenza immunisations given in community pharmacies, by risk group, 2022/23

Risk Group	n	Immunised in pharmacies		Total recorded as vaccinated in general practice databases (n) ¹	% of total vaccinations given through pharmacies ¹
		% of total risk group pharmacy influenza vaccinations	% of total pharmacy influenza vaccinations		
Asplenia or splenic dysfunction	103	0.4	0.1	5,532	1.9
Chronic Heart Disease	3,736	14.4	2.3	33,934	11.0
Chronic Kidney Disease	342	1.3	0.2	7,814	4.4
Chronic Liver Disease	146	0.6	0.1	5,328	2.7
Chronic Neurological Disease	911	3.5	0.6	18,103	5.0
Chronic Respiratory Disease	11,714	45.2	7.3	86,997	13.5
Diabetes	5,221	20.1	3.2	54,711	9.5
Epilepsy	494	1.9	0.3		
Immuno-suppressed	2,681	10.3	1.7	14,497	18.5
Morbidly obese adults	570	2.2	0.4	37,553	1.5
Total	25,918	100.0	16.1	200,211	12.9

¹Completeness of reporting of pharmacy vaccinations to general practices and consistency of coding for pharmacy vaccinations in general practice databases are unknown. Due to this the total number of individuals vaccinated may be an underestimate.

Table 4.2.13. Number of influenza immunisations given to patients aged 65y and older, aged 50y to 65y, and those aged 6m to 64y at clinical risk in community pharmacies, by health board of residence 2022/23

Health Board	Patients aged 65y and older	Patients aged 50y to 64y	Eligible patients aged <65y at clinical risk	Other Eligible patients aged <65y of age
	Immunised(n)	Immunised(n)	Immunised(n)	Immunised(n)
Aneurin Bevan UHB	10,455	10,750	4,778	983
Betsi CadwaladrUHB	16,854	16,081	5,891	1,506
Cardiff and Vale UHB	10,009	10,155	4,212	1,072
Cwm Taf Morgannwg UHB	10,802	10,131	4,036	1,076
Hywel Dda UHB	9,776	8,144	3,175	705
Powys Teaching HB	3,381	2,930	1,018	185
Swansea Bay UHB	11,357	8,180	2,807	721
Wales	72,634	66,371	25,917	6,248

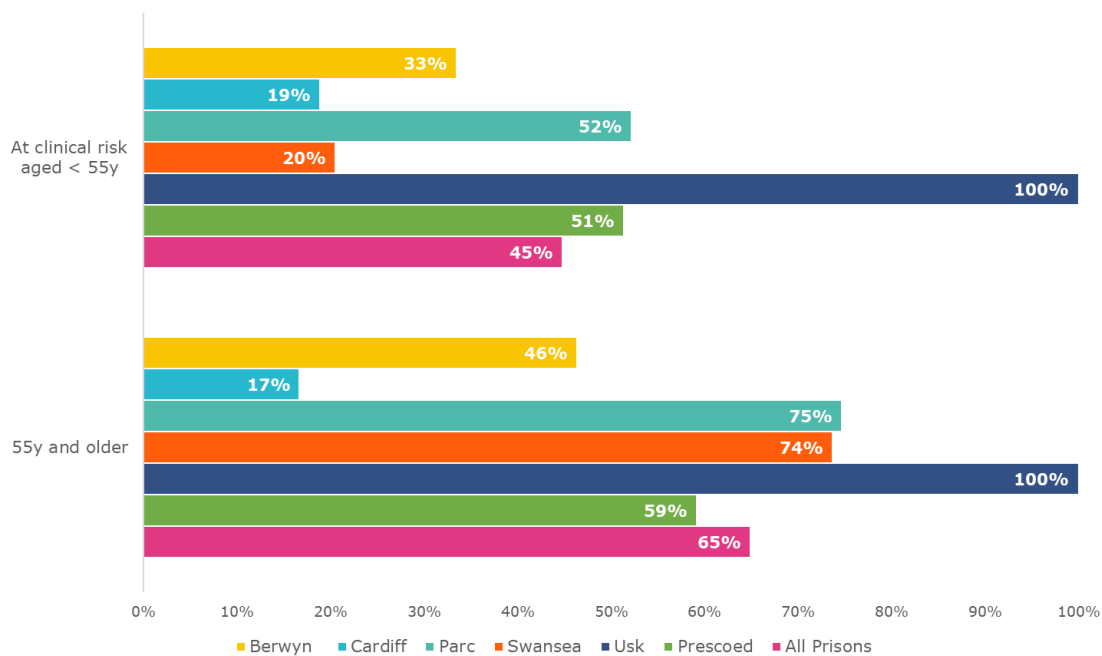
Table 4.2.14. Number of influenza immunisations given to social care sector staff (Domiciliary and Carers in a care home) and unpaid (voluntary or informal) carers in community pharmacies, by health board, 2022/23

Health Board	Social Care Staff		
	Domiciliary Carers	Carers in a Care Home	Unpaid Carers
Aneurin Bevan UHB	246	337	459
Betsi Cadwaladr UHB	242	1,284	725
Cardiff and Vale UHB	169	267	498
Cwm Taf Morgannwg UHB	153	155	448
Hywel Dda UHB	165	216	373
Powys Teaching HB	68	77	203
Swansea Bay UHB	122	262	387
Wales	1,165	2,598	3,093

4.2.8 Immunisations given in prisons

All prisons in Wales were asked to provide prisoners’ immunisation data on monthly basis. By the end of the season, immunisation coverage ranged from 19% up to 100% in those at clinical risk aged under 55 years and from 17% up to 100% among those aged 55 years and older. Data presented represents uptake as at March 2023 or the most recent data submission of each prison if data at this date was not available. For HMP Swansea the most recent data available was February 2023 and for HMP Usk and HMP Prescoed the most recent data available was January 2023. The different nature of prisons may lead to variation in coverage.

Figure 4.2.8.1 Number of influenza immunisations given to prison residents by risk group, 2022/23



5. Conclusions

This was the first season since 2019-20 that significant circulation of influenza was detected in Wales. Although it was shorter in duration than previous pre-pandemic influenza seasons (based on GP ILI consultations), the 2022/23 season still presented a substantial burden of disease to the population of Wales and additional pressures to health care services in Wales. Co-circulation of influenza A(H1) and influenza A(H3) viruses; and the increase in influenza B activity towards the end of the season demonstrates the year-on-year variability in patterns virus circulation. In addition to the burden of disease directly attributable to influenza, the 2022/23 season coincided with significant circulation of Group A Streptococci, this may have contributed to pressures felt by services and the overall level of morbidity and mortality observed.

Although fewer samples were tested than the high testing levels seen throughout much of the COVID-19 pandemic, testing levels remained significantly higher than those before 2020. The continuation of rapid influenza testing for those attending hospital highlights the burden of influenza and other acute respiratory infections for hospital attendances, with more than 2,300 confirmed cases in Emergency Departments. Test positivity for patients sampled in Emergency Departments was 11.1% and 10.8% for influenza and SARS-CoV2 respectively during 2022-23. In patients sampled in intensive care units influenza test positivity was 4.8%, whilst SARS-CoV2 positivity was 8.3%.

Following record numbers of influenza vaccinations being delivered during the 2021-22 season, the number of eligible patients who received the vaccine decreased in 2022-23. Percentage uptake decreased across all eligible groups, with the largest decrease seen in pregnant women. During 2021-22, more than twice the number of vaccinations were given in community pharmacies compared to the previous year; however in 2022-23, this number has decreased slightly. The provision of the childhood flu programme across all school ages continued in 2022-23, although there was a decrease in uptake compared to 2021-22.

Vaccine effectiveness studies from the UK show that the flu vaccine offered significant protection against influenza A(H3) and influenza A(H1), but somewhat lower in some age-groups than in seasons before 2020. Genetic variation and continued divergence of influenza A(H3N2) virus clades continues to pose challenges to vaccine effectiveness, with potential for limited cross-protection against circulating clades.

6. References

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Further information on influenza and influenza immunisation can be found using the links below:

Information for Health and Social Care Professionals on influenza immunisation:

<https://phw.nhs.wales/topics/immunisation-and-vaccines/flu vaccine/resourcesforprofessionals/>

General information on influenza immunisation in Wales:

<https://phw.nhs.wales/topics/immunisation-and-vaccines/flu vaccine/>

Influenza surveillance in Wales:

<https://phw.nhs.wales/topics/immunisation-and-vaccines/flu vaccine/weekly-influenza-and-acute-respiratory-infection-report/>

7. Information about this report

Report Team

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Suggested citation

Public Health Wales Vaccine Preventable Disease Programme and Communicable Disease Surveillance Centre. Seasonal Influenza in Wales - 2022/23, October 2023. Cardiff: Public Health Wales.

8. Appendix A: Influenza immunisation data tables

Table A1. Uptake of influenza immunisation in Wales 2022/23.

Local Authority	Patients aged 65y and older			Patients aged 6m to 64y at risk		
	Immunised (n)	Denominator (n)	Uptake (%)	Immunised (n)	Denominator (n)	Uptake (%)
Aneurin Bevan UHB						
Blaenau Gwent LA	10,614	14,542	73.0	5,136	11,776	43.6
Caerphilly LA	29,153	37,625	77.5	12,702	27,774	45.7
Monmouthshire LA	22,094	26,263	84.1	7,878	13,742	57.3
Newport LA	18,663	24,622	75.8	9,539	20,794	45.9
Torfaen LA	15,773	20,146	78.3	7,004	15,066	46.5
Health Board Total	96,297	123,198	78.2	42,259	89,152	47.4
Betsi Cadwaladr UHB						
Anglesey LA	14,080	17,617	79.9	4,989	9,537	52.3
Conwy LA	24,400	31,466	77.5	6,917	15,348	45.1
Denbighshire LA	19,284	25,069	76.9	7,092	14,967	47.4
Flintshire LA	26,145	32,272	81.0	9,880	20,852	47.4
Gwynedd LA	21,638	28,797	75.1	7,134	16,059	44.4
Wrexham LA	24,266	30,414	79.8	9,925	21,046	47.2
Health Board Total	129,813	165,635	78.4	45,937	97,809	47.0
Cardiff and Vale UHB						
Cardiff LA	43,139	57,407	75.1	20,307	51,180	39.7
Vale of Glamorgan LA	21,997	28,637	76.8	7,011	17,698	39.6
Health Board Total	65,136	86,044	75.7	27,318	68,878	39.7
Cwm Taf Morgannwg UHB						
Bridgend LA	26,327	33,621	78.3	11,138	24,638	45.2
Merthyr Tydfil LA	8,073	11,495	70.2	3,898	9,738	40.0
Rhondda Cynon Taff LA	35,934	48,793	73.6	15,453	37,669	41.0
Health Board Total	70,334	93,909	74.9	30,489	72,045	42.3
Hywel Dda UHB						
Carmarthenshire LA	33,198	44,007	75.4	10,880	26,134	41.6
Ceredigion LA	16,931	24,013	70.5	5,010	11,371	44.1
Pembrokeshire LA	23,245	31,872	72.9	6,956	17,194	40.5
Health Board Total	73,374	99,892	73.5	22,846	54,699	41.8
Powys Teaching HB	28,792	39,040	73.8	8,405	17,825	47.2
Swansea Bay UHB						
Neath Port Talbot LA	22,759	30,221	75.3	8,816	19,848	44.4
Swansea LA	39,397	51,712	76.2	14,141	32,591	43.4
Health Board Total	62,156	81,933	75.9	22,957	52,439	43.8
Wales Total	525,902	689,651	76.3	200,211	452,847	44.2

Table A2. Uptake of influenza immunisation in those aged six months to 64 years with one or more clinical risk (by risk category) in Wales 2022/23.

Local Authority	Total patients aged 6m to 64y	Chronic heart disease				Chronic respiratory disease				Chronic kidney disease				Diabetes			
		With condition (n)	Immunised (%)	Uptake (%)	With condition (n)	Immunised (%)	Uptake (%)	With condition (n)	Immunised (%)	Uptake (%)	With condition (n)	Immunised (%)	Uptake (%)				
Aneurin Bevan UHB																	
Blaenau Gwent LA	57,735	1,841	3.2	861	46.8	4,821	8.4	2,186	45.3	415	0.7	221	53.3	2,714	4.7	1,488	54.8
Caerphilly LA	149,369	4,194	2.8	2,078	49.5	11,211	7.5	5,043	45.0	716	0.5	415	58.0	6,416	4.3	3,976	62.0
Monmouthshire LA	77,926	2,373	3.0	1,431	60.3	5,886	7.6	3,108	52.8	428	0.5	314	73.4	2,659	3.4	1,883	70.8
Newport LA	125,373	2,962	2.4	1,480	50.0	8,587	6.8	3,815	44.4	597	0.5	338	56.6	5,052	4.0	2,900	57.4
Torfaen LA	77,546	2,500	3.2	1,206	48.2	6,404	8.3	2,875	44.9	382	0.5	221	57.9	3,192	4.1	1,910	59.8
Health Board Total	487,949	13,870	2.8	7,056	50.9	36,909	7.6	17,027	46.1	2,538	0.5	1,509	59.5	20,033	4.1	12,157	60.7
Betsi Cadwaladr UHB																	
Anglesey LA	48,751	1,305	2.7	744	57.0	4,530	9.3	2,312	51.0	258	0.5	144	55.8	1,898	3.9	1,282	67.5
Conwy LA	85,543	2,430	2.8	1,210	49.8	6,901	8.1	3,085	44.7	536	0.6	293	54.7	3,079	3.6	1,736	56.4
Denbighshire LA	78,996	2,413	3.1	1,206	50.0	7,039	8.9	3,312	47.1	433	0.5	258	59.6	2,900	3.7	1,735	59.8
Flintshire LA	119,531	3,292	2.8	1,709	51.9	9,309	7.8	4,319	46.4	657	0.5	394	60.0	4,234	3.5	2,568	60.7
Gwynedd LA	97,075	2,240	2.3	1,046	46.7	7,583	7.8	3,301	43.5	487	0.5	274	56.3	2,971	3.1	1,705	57.4
Wrexham LA	117,068	3,238	2.8	1,656	51.1	9,407	8.0	4,481	47.6	687	0.6	412	60.0	4,104	3.5	2,422	59.0
Health Board Total	546,964	14,918	2.7	7,571	50.8	44,769	8.2	20,810	46.5	3,058	0.6	1,775	58.0	19,186	3.5	11,448	59.7
Cardiff and Vale UHB																	
Cardiff LA	345,744	7,348	2.1	3,030	41.2	23,368	6.8	9,414	40.3	1,303	0.4	671	51.5	11,105	3.2	5,979	53.8
Vale of Glamorgan LA	105,308	2,723	2.6	1,118	41.1	8,148	7.7	3,124	38.3	497	0.5	248	49.9	3,373	3.2	1,821	54.0
Health Board Total	451,052	10,071	2.2	4,148	41.2	31,516	7.0	12,538	39.8	1,800	0.4	919	51.1	14,478	3.2	7,800	53.9
Cwm Taf Morgannwg UHB																	
Bridgend LA	127,607	4,349	3.4	2,118	48.7	10,626	8.3	4,862	45.8	988	0.8	558	56.5	5,209	4.1	3,046	58.5
Merthyr Tydfil LA	50,337	1,559	3.1	612	39.3	4,212	8.4	1,816	43.1	285	0.6	145	50.9	2,115	4.2	1,183	55.9
Rhondda Cynon Taff LA	198,909	5,521	2.8	2,503	45.3	16,323	8.2	7,025	43.0	1,313	0.7	679	51.7	8,080	4.1	4,513	55.9
Health Board Total	376,853	11,429	3.0	5,233	45.8	31,161	8.3	13,703	44.0	2,586	0.7	1,382	53.4	15,404	4.1	8,742	56.8
Hywel Dda UHB																	
Carmarthenshire LA	139,381	4,475	3.2	2,074	46.3	11,561	8.3	4,667	40.4	794	0.6	433	54.5	5,359	3.8	2,844	53.1
Ceredigion LA	70,038	1,975	2.8	964	48.8	5,021	7.2	2,212	44.1	336	0.5	192	57.1	2,260	3.2	1,229	54.4
Pembrokeshire LA	91,403	2,828	3.1	1,211	42.8	7,745	8.5	3,117	40.2	584	0.6	305	52.2	3,647	4.0	1,874	51.4
Health Board Total	300,822	9,278	3.1	4,249	45.8	24,327	8.1	9,996	41.1	1,714	0.6	930	54.3	11,266	3.7	5,947	52.8
Powys Teaching HB																	
Health Board Total	102,947	3,242	3.1	1,584	48.9	7,503	7.3	3,658	48.8	667	0.6	384	57.6	3,424	3.3	1,992	58.2
Swansea Bay UHB																	
Neath Port Talbot LA	109,458	3,526	3.2	1,649	46.8	7,205	6.6	3,231	44.8	780	0.7	450	57.7	4,553	4.2	2,584	56.8
Swansea LA	209,377	5,476	2.6	2,444	44.6	12,959	6.2	6,034	46.6	895	0.4	465	52.0	7,260	3.5	4,041	55.7
Health Board Total	318,835	9,002	2.8	4,093	45.5	20,164	6.3	9,265	45.9	1,675	0.5	915	54.6	11,813	3.7	6,625	56.1
Wales Total	2,585,422	71,810	2.8	33,934	47.3	196,349	7.6	86,997	44.3	14,038	0.5	7,814	55.7	95,604	3.7	54,711	57.2

Table A2 (cont). Uptake of influenza immunisation in those aged six months to 64 years with one or more clinical risk (by risk category) in Wales 2022/23.

Local Authority	Total patients aged 6m to 64y	Immuno-suppression				Chronic liver disease				Neurological conditions				Morbidly obese				Asplenia/ splenic dysfunction			
		With condition (n)	(%)	Immunised (n)	Uptake (%)	With condition (n)	(%)	Immunised (n)	Uptake (%)	With condition (n)	(%)	Immunised (n)	Uptake (%)	With condition (n)	(%)	Immunised (n)	Uptake (%)	With condition (n)	(%)	Immunised (n)	Uptake (%)
Aneurin Bevan UHB																					
Blaenau Gwent LA	57,735	748	1.3	431	57.6	331	0.6	143	43.2	886	1.5	427	48.2	2,882	5.0	1,121	38.9	292	0.5	130	44.5
Caerphilly LA	149,369	1,523	1.0	882	57.9	674	0.5	334	49.6	2,168	1.5	1,103	50.9	6,952	4.7	2,985	42.9	749	0.5	306	40.9
Monmouthshire LA	77,926	865	1.1	625	72.3	328	0.4	205	62.5	1,131	1.5	751	66.4	2,660	3.4	1,572	59.1	522	0.7	275	52.7
Newport LA	125,373	1,290	1.0	755	58.5	532	0.4	243	45.7	1,511	1.2	787	52.1	4,550	3.6	1,944	42.7	573	0.5	230	40.1
Torfaen LA	77,546	1,058	1.4	645	61.0	398	0.5	201	50.5	1,207	1.6	618	51.2	3,297	4.3	1,531	46.4	475	0.6	224	47.2
Health Board Total	487,949	5,484	1.1	3,338	60.9	2,263	0.5	1,126	49.8	6,903	1.4	3,686	53.4	20,341	4.2	9,153	45.0	2,611	0.5	1,165	44.6
Betsi Cadwaladr UHB																					
Anglesey LA	48,751	638	1.3	421	66.0	221	0.5	117	52.9	778	1.6	445	57.2	1,942	4.0	967	49.8	262	0.5	128	48.9
Conwy LA	85,543	947	1.1	523	55.2	434	0.5	197	45.4	1,285	1.5	630	49.0	2,799	3.3	1,149	41.1	506	0.6	227	44.9
Denbighshire LA	78,996	969	1.2	575	59.3	447	0.6	199	44.5	1,280	1.6	655	51.2	2,819	3.6	1,252	44.4	440	0.6	195	44.3
Flintshire LA	119,531	1,313	1.1	787	59.9	559	0.5	259	46.3	1,546	1.3	832	53.8	4,050	3.4	1,740	43.0	623	0.5	280	44.9
Gwynedd LA	97,075	1,055	1.1	609	57.7	390	0.4	162	41.5	1,249	1.3	581	46.5	2,868	3.0	1,200	41.8	486	0.5	188	38.7
Wrexham LA	117,068	1,250	1.1	715	57.2	607	0.5	259	42.7	1,530	1.3	804	52.5	4,583	3.9	1,912	41.7	608	0.5	286	47.0
Health Board Total	546,964	6,172	1.1	3,630	58.8	2,658	0.5	1,193	44.9	7,668	1.4	3,947	51.5	19,061	3.5	8,220	43.1	2,925	0.5	1,304	44.6
Cardiff and Vale UHB																					
Cardiff LA	345,744	3,058	0.9	1,545	50.5	1,197	0.3	470	39.3	3,886	1.1	1,658	42.7	8,893	2.6	3,155	35.5	1,758	0.5	637	36.2
Vale of Glamorgan LA	105,308	1,011	1.0	572	56.6	384	0.4	155	40.4	1,463	1.4	641	43.8	3,137	3.0	1,142	36.4	595	0.6	221	37.1
Health Board Total	451,052	4,069	0.9	2,117	52.0	1,581	0.4	625	39.5	5,349	1.2	2,299	43.0	12,030	2.7	4,297	35.7	2,353	0.5	858	36.5
Cwm Taf Morgannwg UHB																					
Bridgend LA	127,607	1,041	0.8	584	56.1	560	0.4	258	46.1	2,139	1.7	1,090	51.0	5,091	4.0	2,052	40.3	672	0.5	294	43.8
Merthyr Tydfil LA	50,337	461	0.9	243	52.7	283	0.6	100	35.3	811	1.6	373	46.0	2,305	4.6	786	34.1	204	0.4	79	38.7
Rhondda Cynon Taff LA	198,909	1,927	1.0	978	50.8	1,065	0.5	450	42.3	2,981	1.5	1,301	43.6	9,025	4.5	3,041	33.7	904	0.5	341	37.7
Health Board Total	376,853	3,429	0.9	1,805	52.6	1,908	0.5	808	42.3	5,931	1.6	2,764	46.6	16,421	4.4	5,879	35.8	1,780	0.4	714	40.1
Hywel Dda UHB																					
Carmarthenshire LA	139,381	1,408	1.0	779	55.3	589	0.4	259	44.0	2,442	1.8	1,143	46.8	5,282	3.8	2,057	38.9	614	0.4	253	41.2
Ceredigion LA	70,038	629	0.9	340	54.1	286	0.4	132	46.2	951	1.4	440	46.3	2,033	2.9	826	40.6	394	0.6	160	40.6
Pembrokeshire LA	91,403	1,038	1.1	566	54.5	510	0.6	222	43.5	1,494	1.6	669	44.8	3,227	3.5	1,173	36.3	518	0.6	202	39.0
Health Board Total	300,822	3,075	1.0	1,685	54.8	1,385	0.5	613	44.3	4,887	1.6	2,252	46.1	10,542	3.5	4,056	38.5	1,526	0.5	615	40.3
Powys Teaching HB																					
Health Board Total	102,947	1,083	1.1	631	58.3	445	0.4	224	50.3	1,696	1.6	852	50.2	3,257	3.2	1,379	42.3	633	0.6	274	43.3
Swansea Bay UHB																					
Neath Port Talbot LA	109,458	892	0.8	494	55.4	582	0.5	270	46.4	1,805	1.6	872	48.3	5,178	4.7	2,081	40.2	491	0.4	221	45.0
Swansea LA	209,377	1,650	0.8	797	48.3	1,149	0.5	469	40.8	3,059	1.5	1,431	46.8	6,672	3.2	2,488	37.3	946	0.5	381	40.3
Health Board Total	318,835	2,542	0.8	1,291	50.8	1,731	0.5	739	42.7	4,864	1.5	2,303	47.3	11,850	3.7	4,569	38.6	1,437	0.5	602	41.9
Wales Total	2,585,422	25,854	1.0	14,497	56.1	11,971	0.5	5,328	44.5	37,298	1.4	18,103	48.5	93,502	3.6	37,553	40.2	13,265	0.5	5,532	41.7

Table A3. Uptake of influenza immunisation in pregnant women, with breakdown for those who have another clinical risk condition in Wales 2022/23.

Local Authority	Pregnant women with clinical risk			Pregnant women without clinical risk			Total pregnant women		
	Immunised	Denominator	Uptake	Immunised	Denominator	Uptake	Immunised	Denominator	Uptake
	(n)	(n)	(%)	(n)	(n)	(%)	(n)	(n)	(%)
<u>Aneurin Bevan UHB</u>									
Blaenau Gwent LA	25	58	43.1	114	401	28.4	139	459	30.3
Caerphilly LA	60	130	46.2	300	845	35.5	360	975	36.9
Monmouthshire LA	55	95	57.9	282	678	41.6	337	773	43.6
Newport LA	68	143	47.6	375	1,286	29.2	443	1,429	31.0
Torfaen LA	37	84	44.0	172	531	32.4	209	615	34.0
Health Board Total	245	510	48.0	1,243	3,741	33.2	1,488	4,251	35.0
<u>Betsi Cadwaladr UHB</u>									
Anglesey LA	28	52	53.8	159	406	39.2	187	458	40.8
Conwy LA	45	96	46.9	258	726	35.5	303	822	36.9
Denbighshire LA	53	120	44.2	233	739	31.5	286	859	33.3
Flintshire LA	72	144	50.0	333	1,016	32.8	405	1,160	34.9
Gwynedd LA	47	102	46.1	264	684	38.6	311	786	39.6
Wrexham LA	67	149	45.0	266	993	26.8	333	1,142	29.2
Health Board Total	312	663	47.1	1,513	4,564	33.2	1,825	5,227	34.9
<u>Cardiff and Vale UHB</u>									
Cardiff LA	108	225	48.0	692	1,926	35.9	800	2,151	37.2
Vale of Glamorgan LA	18	49	36.7	176	406	43.3	194	455	42.6
Health Board Total	126	274	46.0	868	2,332	37.2	994	2,606	38.1
<u>Cwm Taf Morgannwg UHB</u>									
Bridgend LA	63	157	40.1	354	1,082	32.7	417	1,239	33.7
Merthyr Tydfil LA	21	34	61.8	75	247	30.4	96	281	34.2
Rhondda Cynon Taff LA	57	135	42.2	360	1,003	35.9	417	1,138	36.6
Health Board Total	141	326	43.3	789	2,332	33.8	930	2,658	35.0
<u>Hywel Dda UHB</u>									
Carmarthenshire LA	53	123	43.1	248	763	32.5	301	886	34.0
Ceredigion LA	19	51	37.3	117	399	29.3	136	450	30.2
Pembrokeshire LA	42	105	40.0	232	727	31.9	274	832	32.9
Health Board Total	114	279	40.9	597	1,889	31.6	711	2,168	32.8
<u>Powys Teaching HB</u>									
	59	108	54.6	304	802	37.9	363	910	39.9
<u>Swansea Bay UHB</u>									
Neath Port Talbot LA	21	39	53.8	114	321	35.5	135	360	37.5
Swansea LA	64	117	54.7	431	1,126	38.3	495	1,243	39.8
Health Board Total	85	156	54.5	545	1,447	37.7	630	1,603	39.3
Wales Total	1,082	2,316	46.7	5,859	17,107	34.2	6,941	19,423	35.7

Table A4. Uptake of influenza immunisation in those aged six months to 64 years and recorded as being a carer in Wales 2022/23.

Local Authority	Total carers		
	Immunised (n)	Denominator (n)	Uptake (%)
<u>Aneurin Bevan UHB</u>			
Blaenau Gwent LA	349	685	50.9
Caerphilly LA	1,305	2,370	55.1
Monmouthshire LA	1,236	1,865	66.3
Newport LA	952	1,832	52.0
Torfaen LA	985	1,673	58.9
Health Board Total	4,827	8,425	57.3
<u>Betsi Cadwaladr UHB</u>			
Anglesey LA	692	1,259	55.0
Conwy LA	918	1,824	50.3
Denbighshire LA	1,037	2,048	50.6
Flintshire LA	1,261	2,546	49.5
Gwynedd LA	987	2,086	47.3
Wrexham LA	1,482	2,609	56.8
Health Board Total	6,377	12,372	51.5
<u>Cardiff and Vale UHB</u>			
Cardiff LA	1,611	3,446	46.7
Vale of Glamorgan LA	824	1,800	45.8
Health Board Total	2,435	5,246	46.4
<u>Cwm Taf Morgannwg UHB</u>			
Bridgend LA	1,005	1,836	54.7
Merthyr Tydfil LA	289	548	52.7
Rhondda Cynon Taff LA	1,368	2,753	49.7
Health Board Total	2,662	5,137	51.8
<u>Hywel Dda UHB</u>			
Carmarthenshire LA	1,926	3,796	50.7
Ceredigion LA	830	1,638	50.7
Pembrokeshire LA	1,135	2,663	42.6
Health Board Total	3,891	8,097	48.1
<u>Powys Teaching HB</u>			
	999	1,901	52.6
<u>Swansea Bay UHB</u>			
Neath Port Talbot LA	1,116	2,035	54.8
Swansea LA	1,660	3,519	47.2
Health Board Total	2,776	5,554	50.0
Wales Total	23,967	46,732	51.3

Table A5. Uptake of influenza immunisation, through general practice, in children aged two and three years in Wales 2022/23.

Local Authority	Two year olds			Three year olds		
	Immunised (n)	Denominator (n)	Uptake (%)	Immunised (n)	Denominator (n)	Uptake (%)
<u>Aneurin Bevan UHB</u>						
Blaenau Gwent LA	353	722	48.9	355	770	46.1
Caerphilly LA	856	1,810	47.3	895	1,855	48.2
Monmouthshire LA	598	898	66.6	582	866	67.2
Newport LA	730	1,817	40.2	790	1,908	41.4
Torfaen LA	420	1,010	41.6	438	1,040	42.1
Health Board Total	2,957	6,257	47.3	3,060	6,439	47.5
<u>Betsi Cadwaladr UHB</u>						
Anglesey LA	321	568	56.5	325	569	57.1
Conwy LA	356	963	37.0	427	1,035	41.3
Denbighshire LA	390	980	39.8	451	1,045	43.2
Flintshire LA	536	1,389	38.6	613	1,458	42.0
Gwynedd LA	519	1,138	45.6	484	1,100	44.0
Wrexham LA	593	1,451	40.9	565	1,436	39.3
Health Board Total	2,715	6,489	41.8	2,865	6,643	43.1
<u>Cardiff and Vale UHB</u>						
Cardiff LA	1,671	3,918	42.6	1,699	3,995	42.5
Vale of Glamorgan LA	613	1,305	47.0	638	1,331	47.9
Health Board Total	2,284	5,223	43.7	2,337	5,326	43.9
<u>Cwm Taf Morgannwg UHB</u>						
Bridgend LA	758	1,575	48.1	760	1,637	46.4
Merthyr Tydfil LA	187	637	29.4	217	680	31.9
Rhondda Cynon Taff LA	1,060	2,439	43.5	1,351	2,488	54.3
Health Board Total	2,005	4,651	43.1	2,328	4,805	48.4
<u>Hywel Dda UHB</u>						
Carmarthenshire LA	703	1,661	42.3	794	1,788	44.4
Ceredigion LA	295	676	43.6	311	670	46.4
Pembrokeshire LA	291	1,020	28.5	349	1,122	31.1
Health Board Total	1,289	3,357	38.4	1,454	3,580	40.6
<u>Powys Teaching HB</u>						
	587	1,156	50.8	661	1,222	54.1
<u>Swansea Bay UHB</u>						
Neath Port Talbot LA	463	1,293	35.8	515	1,336	38.5
Swansea LA	886	2,308	38.4	1,027	2,517	40.8
Health Board Total	1,349	3,601	37.5	1,542	3,853	40.0
Wales Total	13,186	30,734	42.9	14,247	31,868	44.7

9. Appendix B: Phylogenetic trees of influenza viruses during the 2022-23 season

Figure B1: Phylogenetic analysis of genetically characterised A(H3N2) viruses circulating in Wales during the 2022/2023 influenza season.

Phylogenetic tree constructed using Seaview and rooted to the reference virus (A/Darwin/6/2021). Clade representatives (A/Bangladesh/4005/2020, A/Darwin/9/2021 and A/Slovenia/8720/2022) are denoted by a red asterisk next to isolate name. Vaccine viruses (A/Darwin/6/2021 and A/Darwin/9/2021) are denoted by a yellow highlight.

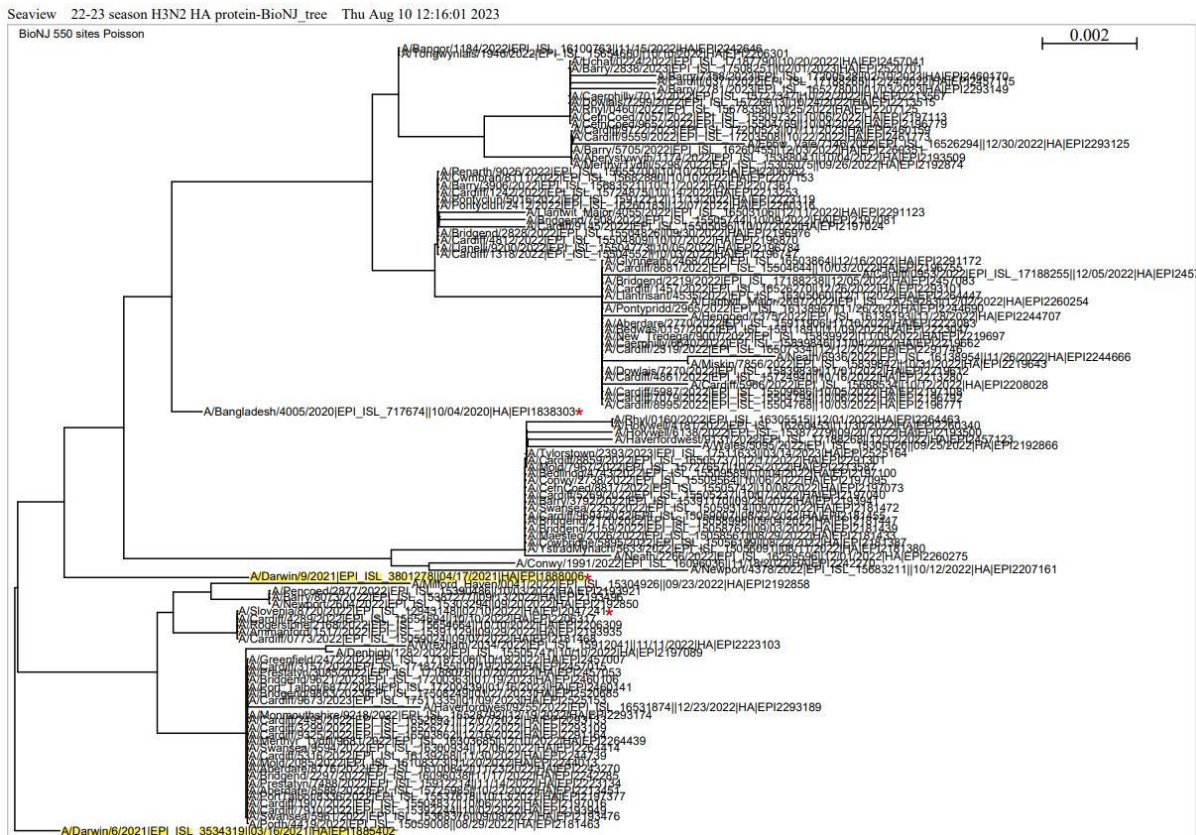


Figure B2: Phylogenetic analysis of genetically characterised A(H1N1)pdm09 viruses circulating in Wales during the 2022-2023 influenza season.

Phylogenetic tree constructed using Seaview and rooted to the reference virus (A/Wisconsin/588/2019). Clade representative (A/India/Pun-NIV312851/2021) is denoted by a red asterisk next to isolate name. Vaccine viruses (A/Wisconsin/588/2019 and A/Victoria/2570/2019) are denoted by a yellow highlight.

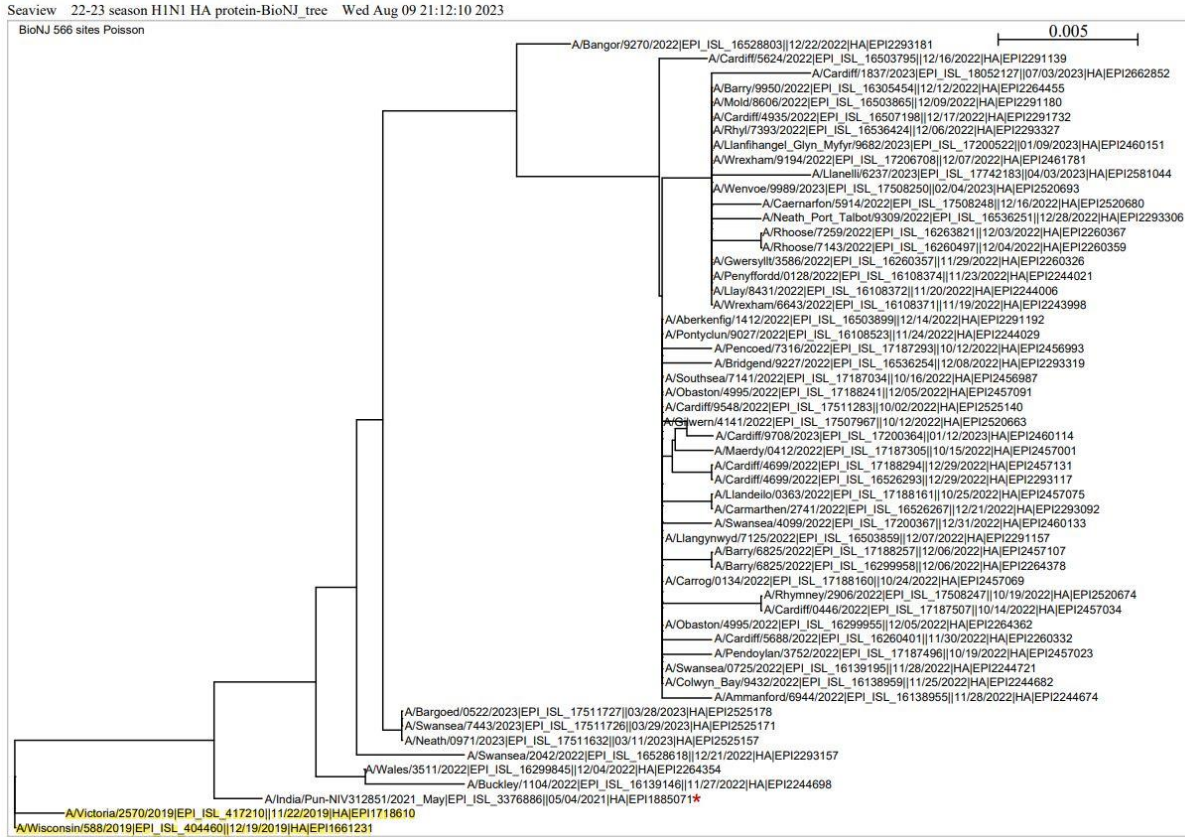


Figure B3: Phylogenetic analysis of genetically characterised B(Victoria) virus haemagglutinin circulating in Wales during the 2022-2023 influenza season.

Phylogenetic tree constructed using Seaview and rooted to the reference virus (B/Brisbane/60/2008). Clade representative (B/Austria/1359417/2021) is denoted by a red asterisk next to isolate name. Vaccine viruses (B/Brisbane/60/2008 and B/Austria/1359417/2021) are denoted by a yellow highlight.

