



# Seasonal influenza in Wales 2017/18

## Annual Report

# Summary

## The season

Higher numbers of influenza cases than at any other time since the 2009 pandemic were diagnosed in general practices (GP) and confirmed in hospitals in Wales during the Autumn and Winter of 2017/18. Influenza was first detected in the community in low numbers late in November. In mid/late December the GP consultation rate for Influenza-Like Illness (ILI) crossed the baseline threshold, indicating the onset of seasonal circulation. At the same time, the number of patients in hospital reported with symptoms of acute respiratory infections and the proportion who tested positive for influenza also increased. By the end of December, the GP ILI consultation rate had rapidly increased to medium level intensity and by early January increased to high levels of intensity. Similar increases were seen in the proportions of patients in hospitals with confirmed influenza infections. The peak GP ILI consultation rate occurred during mid-January, and was very close to the threshold for very high intensity, with the peak for numbers of patients testing positive for influenza in hospitals occurring one to two weeks later. Based on the GP ILI consultation rate, the 2017/18 season lasted for 14 weeks and consultations returned to baseline levels late in March. Confirmed cases of influenza in hospitals were seen for a longer period. GP consultation rates for ILI were highest in younger and middle-aged adults, whereas the highest proportions of confirmed cases in hospitals were in older adults and in very young children. There were 88 outbreaks of influenza and ILI reported to the Public Health Wales Health Protection Team this season, the majority (64%) of which occurred in care home settings.

Although the intensity of influenza circulation was highest seen since 2010/11, the timing and duration of the 2017/18 season was not unusual compared to previous years. Influenza B and influenza A(H3N2) co-circulated this season. Influenza B dominated the early part of the season and accounted for the highest proportion of confirmed cases in sentinel GPs in the community. Proportions of influenza type A and type B cases in hospitals were more equal than for community cases, although type B still slightly predominated. The vast majority of influenza A infections this season were due to influenza A(H3N2), with small numbers of A(H1N1)pdm09. Sentinel GP surveillance suggests that influenza A(H3N2) viruses circulating were particularly from the 3C2a2 genetic sub-group. Almost all of the influenza B infections characterised in Wales this season were the Yamagata lineage virus. An influenza B Yamagata virus was contained in the 2017/18 quadrivalent Live Attenuated Influenza Vaccine used in the childhood programme, but not in trivalent inactivated influenza vaccine which was the main vaccine used in for adults.

## Vaccination uptake

Influenza vaccination was received by more individuals in at-risk and recommended groups last season than ever before. An estimated 820,183 people were vaccinated, representing 25% of the population of Wales. In those aged 65 years and older, 68.8% were vaccinated (451,346 individuals), the highest ever. Uptake for clinical risk groups increased to 48.5% (184,055 individuals) this season. The childhood influenza vaccination programme was extended to include children aged two to eight years, 157,531 of whom received vaccination this season. Uptake in two and three year olds increased to 50.2% and in four to eight year olds increased to 68.3%. Coverage of influenza vaccination in pregnant women was 72.7%, estimated in an annual point of delivery (post-natal) survey, this is lower than was reported for the previous year. In front-line NHS staff uptake continued on a long-term positive trend increased to 57.9%, an increase of 6.4 from 51.4% the previous year.

## Vaccine effectiveness

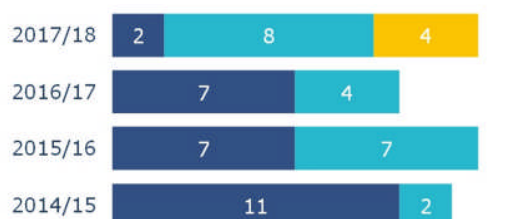
The final estimate for influenza vaccine effectiveness in the United Kingdom (UK) during the 2017/18 season was not available at the time this report was prepared. A summary of mid-season vaccine effectiveness estimates from

five studies carried out in 11 European Countries (including the UK) was published in March. In these specific studies, overall estimates of effectiveness against any confirmed influenza, at any age, ranged from 25% to 52%. Against influenza A(H1) effectiveness ranged from 55% to 68%, against influenza B effectiveness ranged from 36% to 54%. None of the studies found evidence of significant vaccine effectiveness against influenza A(H3N2). Effectiveness of 2017/18 influenza vaccines against circulating types of influenza A(H3N2) viruses remains a concern, however it is hoped that recommended use of adjuvanted vaccines during 2018/19 will improve effectiveness in older adults. In addition, recommended use of quadrivalent inactivated vaccine in younger adults in clinical risk groups will limit the potential for mismatch in the influenza B component of the vaccine.

# INFLUENZA SEASON IN WALES 2017/18

## Dominant types of influenza

### B & A(H3N2)

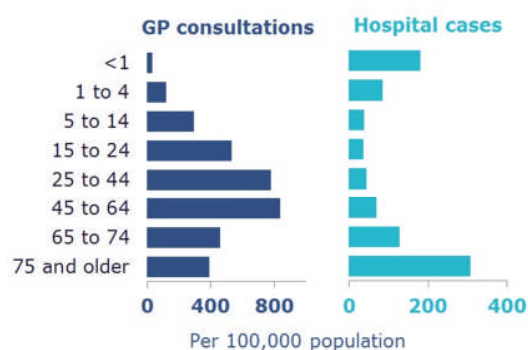


Number of weeks at:

■ Low level ■ Medium level ■ High Level

2017/18 season was more intense than previous seasons

## Age of those affected by influenza



**88** Outbreaks

64% in care homes    28% in hospital wards



**16,657** patients diagnosed with influenza-like illness by GPs



**2,680** patients confirmed with influenza in hospitals



**192** patients confirmed with influenza in intensive care units

## Influenza vaccine uptake

**69%**

65 and over

**49%**

Under 65 at risk

**73%**

Pregnant women

**50%**

Children aged 2-3

**68%**

Children aged 4-8

**58%**

NHS staff with patient contact



The total number of people immunised against influenza is increasing each year



GIG  
CYMRU  
NHS  
WALES

Iechyd Cyhoeddus  
Cymru  
Public Health  
Wales

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## Key Findings

- During 2017/18 there was an increase in influenza as shown across multiple surveillance indicators, compared to previous seasons. The season started later than the 2016/17 season but peaked just below the threshold for very high intensity activity, the highest peak consultation rate since 2010/11.
  - A total of 16,657 patients with ILI were reported by general practices in Wales throughout the season. Consultation rates were highest in patients aged 45 to 64 years (837 per 100,000 for the season), in contrast to the mainly influenza A(H3N2) season in 2016/17 where consultation rates were highest in patients aged 15 to 24 years (352 per 100,000).
  - From 2017 week 40 to 2018 week 15, 2,680 patients in hospitals were confirmed to have influenza, 192 of whom were in intensive care units.
  - Eighty-eight outbreaks of ILI or acute respiratory illness were reported to Public Health Wales, 64% were in care homes, 28% in hospitals and 8% in other settings.
  - Based on provisional estimates, 2017/18 saw higher levels of seasonal excess mortality than in 2016/17, although not as high as seen in 2014/15 (in both of those seasons, influenza A(H3N2) predominated); and a higher number of outbreaks reported compared to 2016/17.
- The season was mainly influenza B with influenza A(H3N2) co circulating. A higher proportion of influenza cases were influenza B positive in general practice sentinel samples (70%) compared to hospital samples (50%).
- By the end of the 2017/18 season most influenza A(H3N2) viruses genetically characterised belonged to clade 3C.2a2, this is a significant change from the beginning of the season and the latter end of the 2016/17 season when most viruses characterised belonged to the 3C.2a1 clade. The recommended vaccine belongs to the 3C.2a1 clade and although the H3N2 viruses are proving challenging in antigenic studies, the available evidence suggests that the two circulating clades are antigenically similar.
- Mid-season vaccine effectiveness studies in Europe reported overall effectiveness as ranging from 25% to 52%. Effectiveness against specific types of influenza varied and were highest against influenza A(H1N1)pdm09. The estimates suggested significant protection against influenza A(H1N1)pdm09 and influenza B, but not against influenza A(H3N2). Results from the equivalent UK study are awaited.
- The antiviral prescribing rate peaked at 9.5 per 100,000 practice population during week 5 2018, almost three times higher than the 2016/17 peak prescribing rate (3.4 per 100,000 practice population) and the highest rate since 2010/11; most viruses were fully sensitive with small numbers with reduced sensitivity to oseltamivir or zanamivir.



- During 2017/18 percentage uptake of influenza vaccine in the eligible population increased in people aged 65 years and over, people aged six months to 64 years with a clinical risk, children aged two and three years and older children immunised in school.
  - Influenza vaccine uptake in those aged 65 years and older in Wales was 68.8% (n=451,346), compared to 66.7% (n=431,791) last season.
  - Uptake of influenza vaccine in people aged six months to 64 years in a clinical risk group was 48.5% (n=184,055), compared to 46.9% (n=174,997) last season.
  - Uptake among clinical risk groups was highest in people with diabetes (61.9%) and lowest in the morbidly obese (34.3%).
  - Uptake of influenza vaccine in pregnant women who gave birth during January 2018 was 72.7% (95% CI 67.8-77.2) (measured in an annual survey of women in major maternity units), a decrease from 76.8% (95% CI 72.5-80.8) last year.
  - 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 50.3% (n=14,262).
  - Uptake of influenza vaccine in children aged two and three years, mainly immunised in general practices, was 50.2% (n=30,057) compared to 45.3% (n=31,956) in 2016/17.
  - Uptake of influenza vaccine in children aged four to eight years, immunised in schools, was 68.3% (n=122,460), compared to 66.9% (n=95,453) in four to seven year olds during 2016/17.
  - Uptake of influenza vaccine in health board and NHS trust staff in Wales, reported by Occupational Health departments, continues on a positive trend. Uptake in staff with direct patient contact was 57.9% (n=34,832), compared to 51.5% (n=30,014) last season. Uptake in all NHS staff was 55.4% (n=48,074) during 2017/18, an increase of 6.2 from 49.2% (n=41,837) last season.
- This is the eighth year that data from general practice on uptake of influenza immunisation in Wales has been collected using the Audit+ software. This report is based on an overall response rate of 100% of general practices in Wales (all of whom provided data through Audit+).
- The total number of individuals in Wales who, according to Read codes in their general practice record, were immunised against influenza was 820,183 for 2017/18, compared to an estimated 761,838 last season. This represents 25% of the estimated total population of Wales who were vaccinated against influenza.
- Community pharmacies across Wales provided 36,130 influenza vaccinations through the NHS community pharmacy influenza service in 2017/18, an increase from 26,889 in 2016/17. This is an estimated 4.8% of all immunisations given to those aged 65 years and older and 6.1% of immunisations given to people aged six months to 64 years in a clinical risk group.



# 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 using a paper based system. The use of Audit+ as a computer based data collection tool began in 2009. 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 suggest medium, high and very high intensities. In Wales, all influenza seasons from 2010/11 onwards are used to provide a frame of historical comparison for MEM analysis.

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. During 2017/18, the following influenza surveillance indicators were monitored each week in Wales:

### *Primary care and community indicators*

- GP consultations for ILI
- 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 in Wales
- Respiratory diagnostic test data for patients in intensive care units in Wales
- Respiratory diagnostic data for patients attending an A&E, medical assessment, or urgent care unit in Wales
- The number of hospitals with wards fully or partially closed due to influenza outbreaks (and the number of wards fully or partially closed)

### *Indicators from other settings*

- Outbreaks of ILI and other acute respiratory illness in institutional settings e.g. hospitals, care homes, schools and nurseries, reported to Public Health Wales health protection teams.

In addition, antigenic characterisation of influenza viruses detected and monitoring of winter excess mortality are carried out by Public Health England at an England and Wales level. Genetic typing of influenza viruses from surveillance in Wales is carried out by Public Health Wales Microbiology Division.

## 1.2 Influenza immunisation

The aim of annual immunisation against influenza is to protect individuals and communities from influenza, minimise the health impact of influenza on the population of Wales, and further contribute to the reduction of antimicrobial resistance by preventing secondary bacterial infections [1].

In Wales in 2017/18, influenza immunisation was again offered free of charge to all people aged 65 years and over, people aged between six months and 64 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 people who are category III obese or have a BMI greater than 40), all pregnant women, residents of long-stay care homes, and 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 and community first responder scheme members.

In addition, influenza immunisation was also recommended for all health and social care workers who are in direct contact with patients or service users, members of voluntary organisations providing planned emergency first aid and first-responders. Employing organisations are responsible for arranging immunisation of frontline health and social care workers.

The Welsh Government influenza immunisation uptake target was 75% for people aged 65 years and over and 55% for those aged between six months and 64 years in clinical risk groups [1]. For NHS staff with direct patient contact, the new target set by Welsh Government in 2017/18 was 60%.

The childhood influenza vaccination programme using live attenuated influenza vaccine (LAIV) nasal spray (Fluenz®) was introduced in a phased manner in September 2013 and that year included all children aged two and three (as at 31 August 2013) and children in School Year 7. In 2014 the programme was extended to also include all four year old children immunised through general practices, and the vaccine changed to Fluenz Tetra®, a quadrivalent LAIV [2]. In 2015, the School Year 7 vaccination was withdrawn and the vaccination of younger age groups was extended to include school based immunisation of primary School Years 1 and 2 (five and six year olds) in addition to two to four year olds (four year olds in reception class were vaccinated in schools) [3]. In 2016, the programme was further expanded to include children aged seven years old (School Year 3), and in 2017 children aged eight years old (School Year 4) were also recommended to receive LAIV [4, 1]. In most health boards influenza immunisations were delivered to the two and three year old age group through general practice only. In 2016 a school based scheme was piloted in Cwm Taf University Health Board (UHB) where three year olds in nursery classes attached to primary schools were offered LAIV nasal spray immunisation through school nursing services, in addition to being able to receive the vaccine through general practice. Following the success of this scheme, it was decided that it would be repeated during the 2017/18 season. Vaccination delivery in reception class and School Years 1, 2, 3 and 4 (the four to eight year old age groups) was through school nursing services in Wales.

Public Health Wales monitor and report GP influenza immunisation uptake rates 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 3<sup>rd</sup> April 2018 and therefore are not a measure of all those who have been immunised during the course of the immunisation campaign.

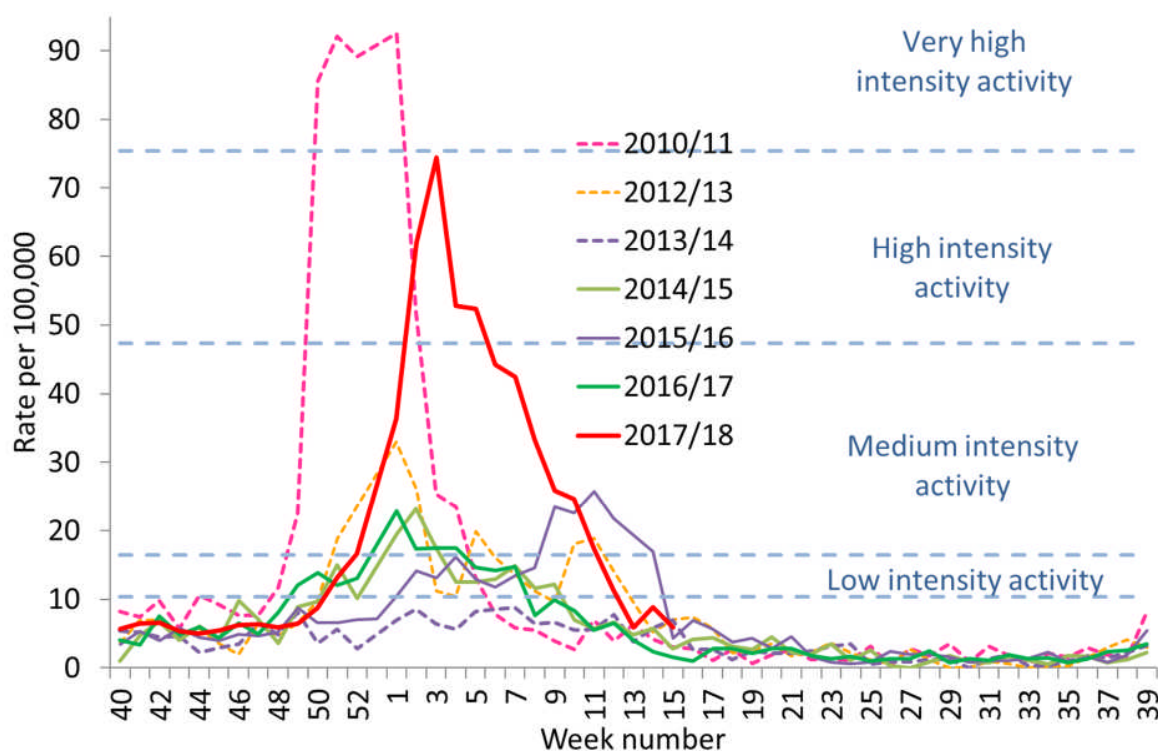
## 2. Influenza Surveillance in 2017/18

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

A threshold level of 10.4 ILI consultations per 100,000 population was used as one of the indicators that influenza may be circulating in the community calculated using the Moving Epidemic Method (MEM) [5]. The GP MEM threshold for medium intensity activity in general practice was 16.5, high intensity activity was 47.3 and very high intensity activity was 75.4 consultations.

The sentinel GP MEM threshold level was first reached during week 51 of 2017 (Figure 2.1.1); this along with an increase in laboratory confirmed cases of influenza in the community and a number of sporadic confirmed cases of influenza in hospitals indicated that it was likely that this was the start of the influenza season in Wales.

**Figure 2.1.1.** Public Health Wales sentinel GP weekly consultation rate for influenza-like illness 2017/18



The sentinel GP ILI consultation rate exceeded the threshold for medium levels of intensity in week 52 of 2017, and high levels of intensity in week 02 of 2018. ILI consultation rate peaked in week 03 at 74.5 per 100,000 practice population, slightly below the very high intensity threshold of 75.4 per 100,000 practice population. The rate remained above the high intensity level from week 02 to week 05 2018 before decreasing to medium intensity, where the weekly consultation rate remained until week 11. The sentinel GP ILI consultation rate returned below the threshold for low intensity seasonal influenza activity in week 13.

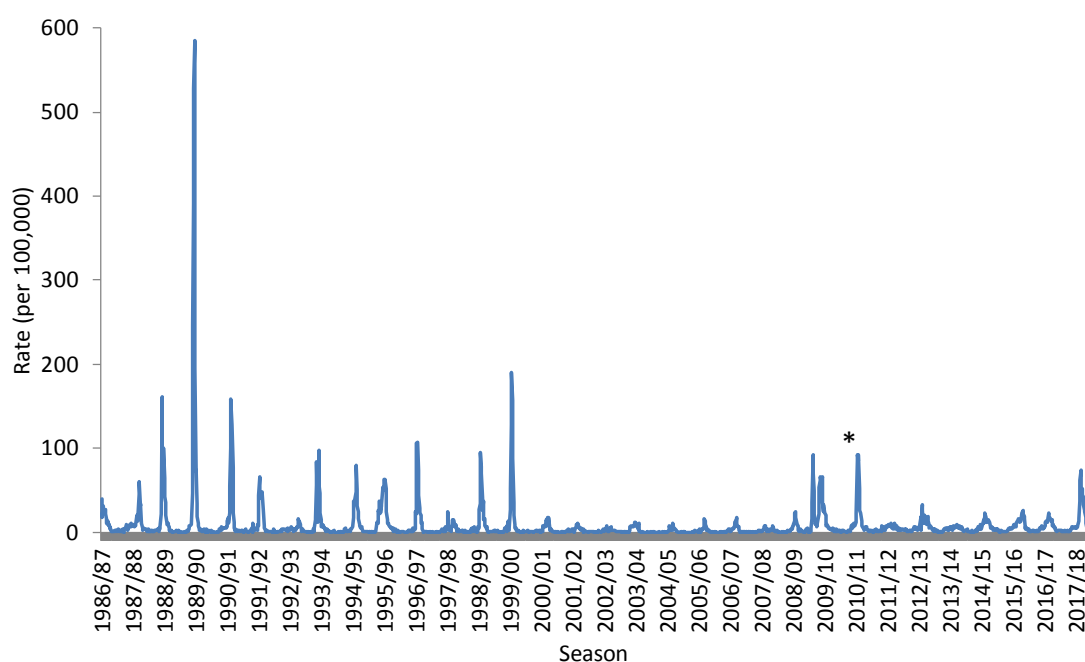
The sentinel GP consultation rate for ILI was above the threshold for low (baseline) intensity seasonal activity for a total of 14 weeks in 2017/18, compared to 11 weeks in 2016/17 (Table 2.1.1). Twelve of the 14 weeks were above medium intensity levels of activity, compared to four weeks observed above medium intensity in 2016/17. It was also the first time the sentinel GP ILI consultation rate exceeded the threshold for high levels of intensity since this threshold was introduced in 2014/15 (Table 2.1.1 and Figure 2.1.1).

**Table 2.1.1.** Comparison of sentinel GP consultation rates from 2012/13 to 2017/18

	Influenza Season					
	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18
Start of season (week of year)	50	Threshold to indicate low level activity not exceeded	50	1	49	51
Weeks sentinel GP ILI consultation rate above baseline threshold (n)	14		13	14	11	14
Weeks sentinel GP ILI consultation rate above medium activity levels (n)	Not available*	Not available*	2	7	4	12
Weeks sentinel GP ILI consultation rate above high activity levels (n)	Not available*	Not available*	0	0	0	4
Peak sentinel GP ILI consultation rate	33.0	8.8	23.2	25.8	22.8	74.5

\*Medium and high intensity thresholds were introduced in 2014/15.

**Figure 2.1.2.** Public Health Wales sentinel GP weekly consultation rate for influenza-like illness 1986 to 2018

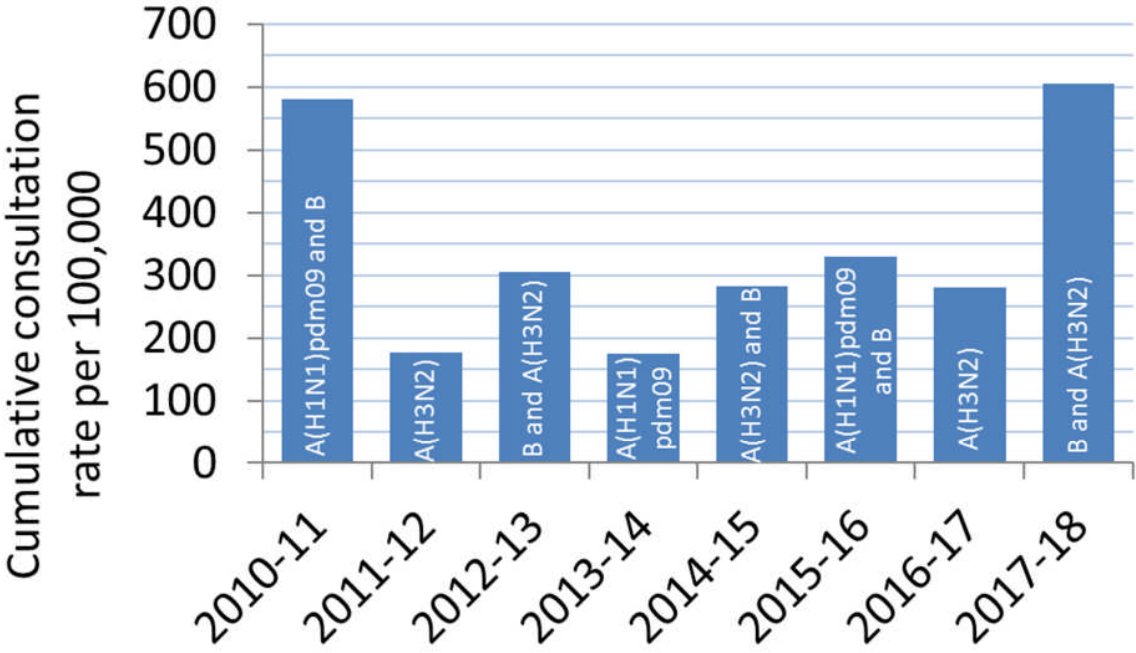


\* Data collection through Audit+ began in 2010 (week 40)

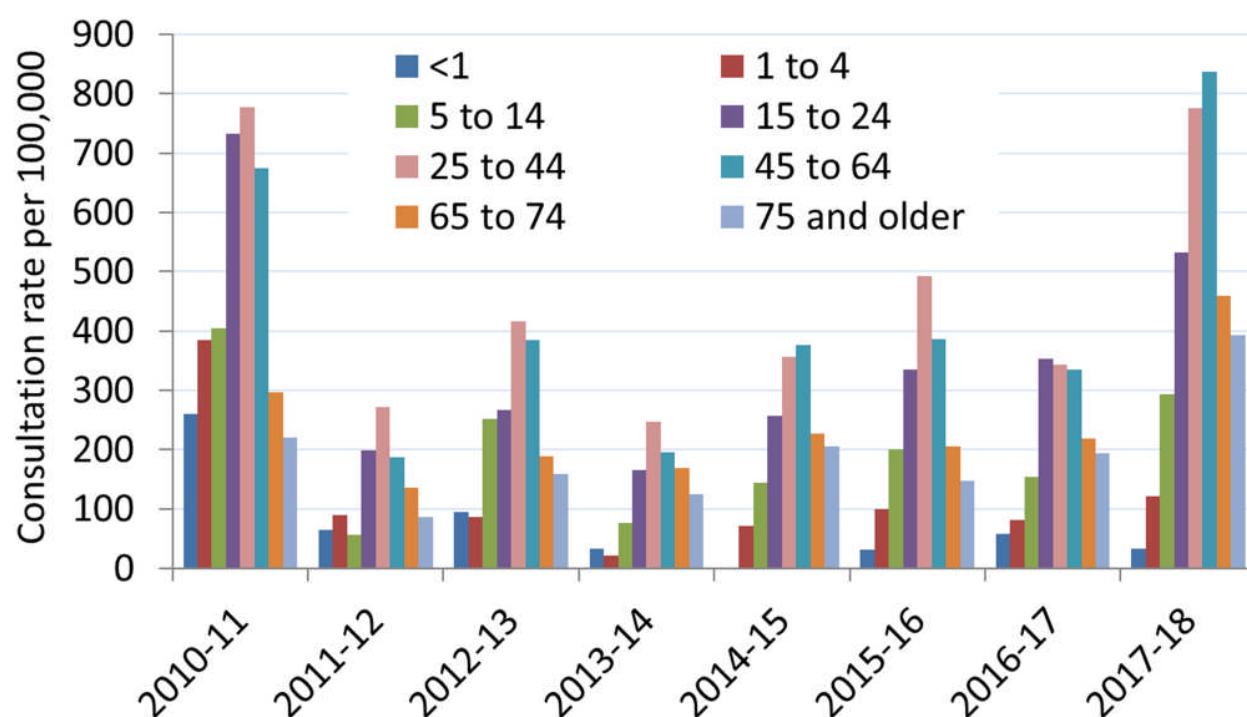
The cumulative sentinel GP ILI rate for 2017/18 was higher than that seen in the previous seven years (Figure 2.1.3). During the period 2017 week 40 to 2018 week 20 (October 2<sup>nd</sup> 2017 to May 20<sup>th</sup> 2018) there were 16,657 consultations with general practices in Wales due to ILI reported to Public Health Wales through Audit+. This is likely to underestimate the true number of people with ILI as only a proportion of those with symptoms of ILI will consult with their GP in any given influenza season.

During 2017/18, the consultation rate for ILI was highest in patients aged 45 to 64 years (837 per 100,000 for the period 2017 week 40 to 2018 week 20). This is a different pattern to 2016/17, where the season was dominated by influenza A(H3N2) and the highest rates were seen in the range of 15 to 64 years old (Figure 2.1.4).

**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 2017/18. Dominant circulating types of influenza are indicated for each 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 2017/18

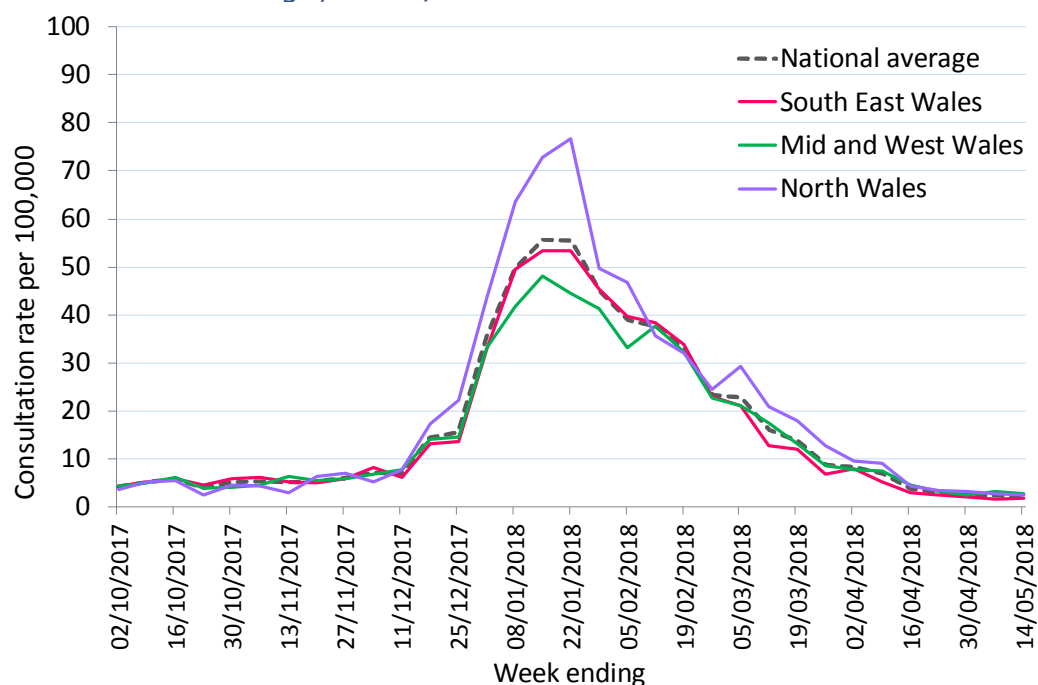


Regional differences in timing and intensity of the influenza season were investigated using all available data from practices providing ILI consultation data, through Audit+, between October 2017 and May 2018 (Figure 2.1.5). GP ILI consultation rates followed a similar pattern in all regions, although peak consultation rates varied.

- In South East Wales (Aneurin Bevan UHB, Cardiff and Vale UHB and Cwm Taf UHB areas), the peak in ILI consultation rate was seen during week 03 (ending 21<sup>st</sup> January), at 53.4 per 100,000 practice population.
- In Mid and West Wales (Abertawe Bro Morgannwg UHB and Hywel Dda UHB areas, and Powys THB area) the peak in ILI consultation rate was seen during week 03 (ending 21<sup>st</sup> January), at 48.0 per 100,000 practice population.
- In North Wales (Betsi Cadwaladr UHB area) the peak in ILI consultation rate was seen during week 04 (ending 28<sup>th</sup> January), at 76.7 per 100,000 practice population.



**Figure 2.1.5.** Weekly consultation rates for influenza-like illness in regions of Wales, data from all available practices submitted through Audit+, compared to the national average, 2017/18



## 2.2 Community indicators - Virological surveillance in the community

Between 2017 week 40 and 2018 week 15 (2<sup>nd</sup> October 2017 to 15<sup>th</sup> April 2018), 23 sentinel GPs submitted 260 samples for virological testing, a mean of 11 samples per participating practice. In previous seasons, sentinel GPs only collected samples from patients whom they diagnosed with ILI. This is the first year we have expanded clinical conditions under surveillance to include acute respiratory illness (ARI), acute bronchitis, and bronchiolitis. Of the samples collected, 193 were clinically diagnosed with ILI (74.2%), 60 with ARI (23.1%), and seven with bronchitis (2.7%). No samples were collected from patients clinically diagnosed with acute bronchiolitis.

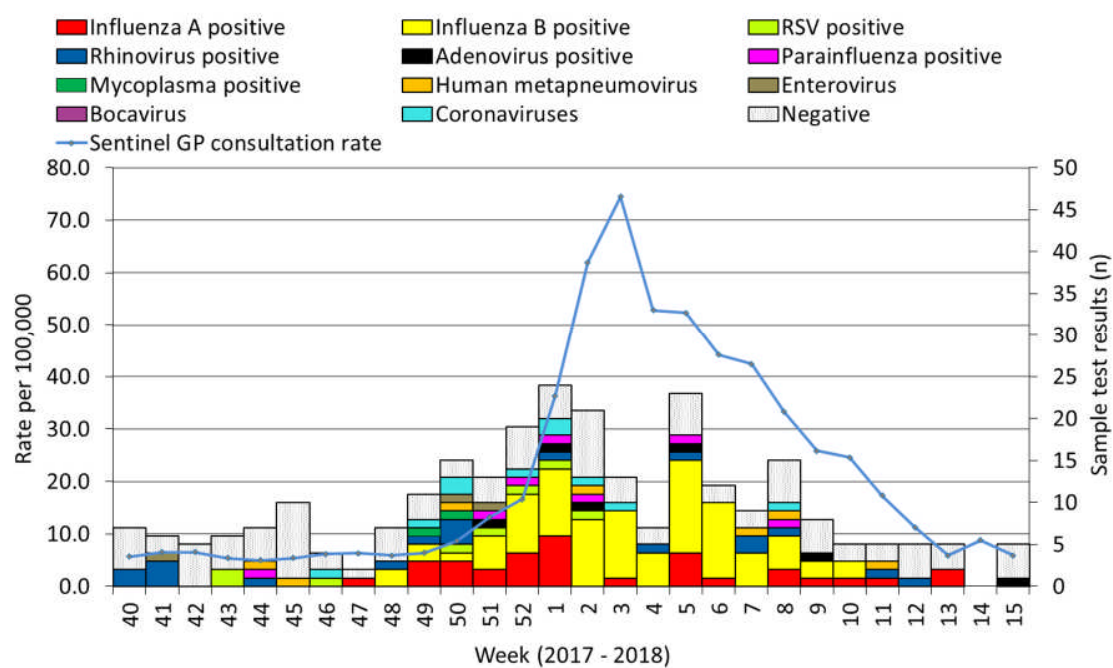
Of the 260 patient samples submitted, 97.7% (n=254) were tested, and 2.3% (n=6) could not be tested. Of those who were tested, 41.7% (n=106) were positive for influenza 83% of which were diagnosed with ILI by sentinel GPs. Of those testing positive for influenza, 69.8% (n=74) tested positive for influenza B, 25.5% (n=27) tested positive for influenza A(H3), 2.8% (n=3) tested positive for influenza A(H1), one patient tested positive for both influenza A(H3) and influenza B, and one patient tested positive for both influenza A(H1) and influenza B.

One or more other seasonal respiratory pathogens were detected in 21.7% (n=55) of patient samples, and 39.0% (n=99) were negative for all routinely tested pathogens. Surveillance samples are routinely tested for: influenza, RSV, adenovirus, *Mycoplasma pneumoniae*, rhinovirus, parainfluenza, human metapneumovirus, human bocavirus, coronaviruses, enterovirus D-68 and other enteroviruses.

The weekly number of samples collected by sentinel GPs from patients with respiratory illnesses peaked in week 05 of 2018 (week ending 4<sup>th</sup> February 2018, 21 patient samples) (Figure 2.2.1). Influenza was first detected in low numbers in 2017 week 47 and was then detected every week until 2018 week 11 (from 20<sup>th</sup> November 2017 to 18<sup>th</sup> March 2018). The peak in weekly number of patients with samples testing positive for influenza aligned with the peak in all surveillance samples submitted.

Influenza A was first detected during 2017 week 47 (one patient sample), peaked in 2018 week 01 (six samples) and was detected in patient samples in most weeks until week 13 2018. Influenza B was first detected during 2017 week 48 (two patient samples), peaked in 2017 week 05 (11 samples), and was detected every week until 2018 week 10.

**Figure 2.2.1.** Results from Public Health Wales GP sentinel virological surveillance for influenza and other seasonal causes of respiratory illness by Week, 2017/18. 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 2017 week 40 and 2018 week 15 by age group<sup>1,2</sup>*

Age Group	Samples Tested		All Influenza		Other		Negative	
	n	%	n	%	n	%	n	%
Under 1	1	0.4%	1	0.9%	0	0.0%	0	0.0%
1 to 4	3	1.2%	1	0.9%	0	0.0%	2	2.0%
5 to 9	9	3.5%	3	2.8%	1	1.8%	5	5.1%
10 to 14	22	8.7%	13	12.3%	3	5.5%	6	6.1%
15 to 24	35	13.8%	10	9.4%	10	18.2%	15	15.2%
25 to 34	26	10.2%	8	7.5%	10	18.2%	9	9.1%
35 to 44	31	12.2%	12	11.3%	6	10.9%	15	15.2%
45 to 64	91	35.8%	44	41.5%	17	30.9%	33	33.3%
65 to 74	27	10.6%	11	10.4%	5	9.1%	11	11.1%
75 and older	9	3.5%	3	2.8%	3	5.5%	3	3.0%
<b>Total</b>	<b>254</b>	<b>100%</b>	<b>106</b>	<b>100%</b>	<b>55</b>	<b>100%</b>	<b>99</b>	<b>100%</b>

<sup>1</sup> There were 12 samples from sentinel GP patients which tested positive for two respiratory pathogens and two samples which tested positive for three respiratory pathogens. Of these, six samples from sentinel GP patients tested positive for influenza and one or more additional seasonal respiratory pathogens.

<sup>2</sup> Surveillance samples are routinely tested for: influenza, RSV, adenovirus, *Mycoplasma pneumoniae*, rhinovirus, parainfluenza, human metapneumovirus, human bocavirus, 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 2017 and week 15 2018, 35.8% were aged 45 to 64 years (Table 2.2.1), the median age of patients tested was 44 years. Out of the sentinel GP patients testing positive for influenza 41.5% were aged 45 to 64 years, and the median patient age was 47 years.

### 2.3 Hospital indicators - Virological surveillance

From 2017 week 40 to 2018 week 15, there were 9,617 samples taken and tested by Public Health Wales Microbiology from hospital patients presenting with symptoms of respiratory infection (Table 2.3.1). The weekly number of samples tested for seasonal respiratory illness peaked during week 03 of 2018 (week ending 21<sup>st</sup> January 2018, n=685). Of the samples from patients in hospital, 49.5% (n=4,760) were collected from patients in general inpatient and outpatient wards, 38.0% (n=3,657) were collected from patients attending A/E or urgent care wards and 12.5% (n=1,200) were collected from patients admitted to an intensive care ward.

Of the samples tested from patients tested in hospital, 2,680 were confirmed with influenza, of whom 47.3% (n=1,268) had influenza A, 49.8% (n=1,334) had influenza B and 2.9% (n=78) had a dual infection with influenza A and influenza B (Table 2.3.1). Of the samples testing positive for influenza A 81.6% (n=1,098) were influenza A(H3N2), 12.7% (n=171) were influenza A(H1N1)pdm09 and 5.7% (n=77) were untyped.

Samples are routinely tested for: influenza, RSV, adenovirus, *Mycoplasma pneumoniae*, rhinovirus, enterovirus, parainfluenza and human metapneumovirus. The two other most commonly detected

respiratory pathogens in the 9,617 samples tested were rhinovirus (12.8%, n= 1,229) and RSV (8.5%, n=819). Other detected causes of respiratory infection included: human metapneumovirus (5.7% n= 547), adenovirus (3.3%, n=314), parainfluenza (3.2%, n=305), enterovirus (2.0%, n=194) and *Mycoplasma pneumoniae* (0.5%, n=49). Forty-four percent (n=4,235) were negative for all routinely tested organisms.

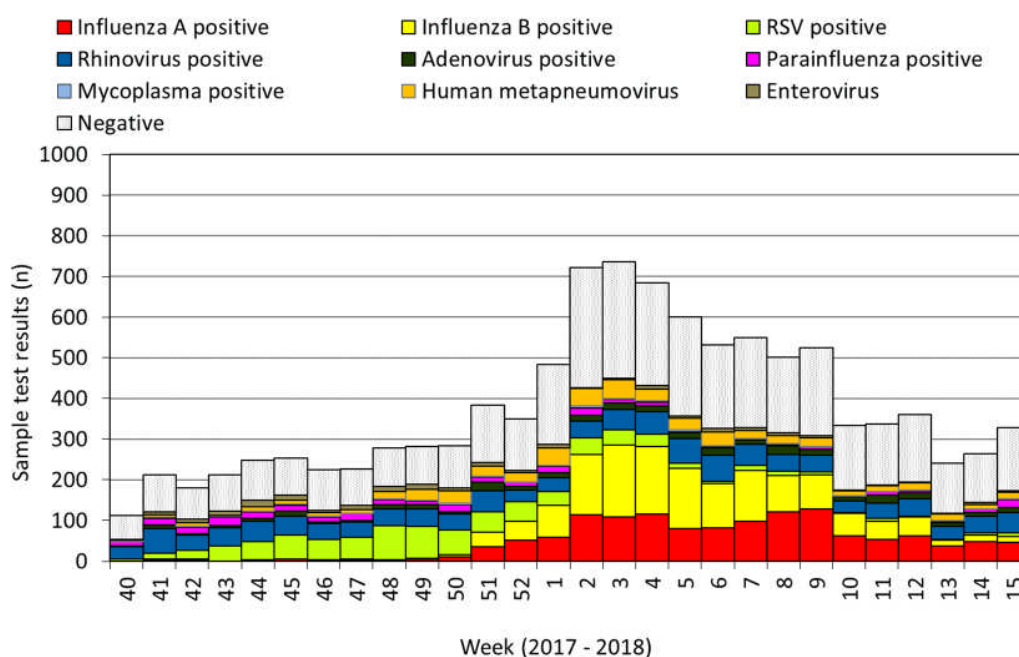
**Table 2.3.1. Respiratory samples submitted and tested for influenza and RSV in Wales in 2017/18, by sample location<sup>1,2</sup>**

Sample Location	All screens		Influenza A		Influenza B		RSV		Other		Negative	
	n	%	n	%	n	%	n	%	n	%	n	%
Sentinel Practice	254	2.4%	32	2.1%	76	4.5%	8	1.0%	55	2.0%	99	2.2%
Non-sentinel Practice	528	5.0%	93	6.2%	162	9.6%	9	1.1%	76	2.8%	211	4.6%
<b>Total Community Samples</b>	<b>782</b>	<b>7.4%</b>	<b>125</b>	<b>8.3%</b>	<b>238</b>	<b>14.2%</b>	<b>17</b>	<b>2.0%</b>	<b>131</b>	<b>4.9%</b>	<b>310</b>	<b>6.7%</b>
Hospital - General	4760	45.1%	675	44.9%	594	35.4%	448	53.3%	1201	44.6%	2124	46.2%
Hospital - A&E	3657	34.7%	573	38.1%	718	42.8%	296	35.2%	882	32.7%	1424	30.9%
Hospital - ITU	1200	11.4%	98	6.5%	100	6.0%	75	8.9%	287	10.6%	687	14.9%
<b>Total Hospital Samples</b>	<b>9617</b>	<b>91.2%</b>	<b>1346</b>	<b>89.6%</b>	<b>1412</b>	<b>84.1%</b>	<b>819</b>	<b>97.5%</b>	<b>2370</b>	<b>87.9%</b>	<b>4235</b>	<b>92.0%</b>
Other / Unknown locations	148	1.4%	31	2.1%	29	1.7%	4	0.5%	38	1.4%	57	1.2%
<b>Total</b>	<b>10547</b>	<b>100%</b>	<b>1502</b>	<b>100%</b>	<b>1679</b>	<b>100%</b>	<b>840</b>	<b>100%</b>	<b>2695</b>	<b>100%</b>	<b>4602</b>	<b>100%</b>

<sup>1</sup> Samples positive and negative will not add up to total screens as some individuals tested positive for more than one pathogen.

<sup>2</sup> Samples are routinely tested for: influenza, RSV, adenovirus, *Mycoplasma pneumoniae*, rhinovirus, enterovirus, parainfluenza and human metapneumovirus.

**Figure 2.3.1. Results from respiratory tests carried out on samples from patients in hospitals in Wales by Week, 2017/18**



Low weekly detections of influenza (less than 10 a week) were seen from 2017 week 40 until week 2017 week 50 (Figure 2.3.1). The number of samples tested peaked in week 03 2018 but the proportion of samples testing positive for influenza peaked in week 08 (n=204/462, 44.2% positivity). The peak week for sample test positivity for Influenza A was week 09 2018 (n=129/488, 26.4% positivity) and the peak week for sample test positivity for influenza B was week 05 of 2018 (n=147/551, 26.7%). The proportion of samples testing positive for influenza exceeded 10% from 2017 week 51 (week ending 24<sup>th</sup> December 2017) through 2018 week 15 (week ending 15<sup>th</sup> April 2018). The peak week for sample test positivity for RSV was week 48 of 2017 (week ending 3<sup>rd</sup> December 2017, 85/243, 35.0%).

**Table 2.3.2.** Patient samples from all hospital locations testing positive for influenza, RSV and other respiratory pathogens between 2017 week 40 and 2018 week 15 by age group<sup>1,2</sup>

Age Group	Samples Tested		All Influenza		RSV		Other		Negative	
	n	%	n	%	n	%	n	%	n	%
Under 1	1231	12.8%	60	2.2%	382	46.6%	589	24.9%	350	8.3%
1 to 4	838	8.7%	118	4.4%	152	18.6%	463	19.5%	190	4.5%
5 to 9	341	3.5%	73	2.7%	20	2.4%	125	5.3%	140	3.3%
10 to 14	198	2.1%	61	2.3%	5	0.6%	48	2.0%	95	2.2%
15 to 24	489	5.1%	141	5.3%	11	1.3%	100	4.2%	250	5.9%
25 to 34	580	6.0%	158	5.9%	17	2.1%	125	5.3%	298	7.0%
35 to 44	544	5.7%	172	6.4%	12	1.5%	89	3.8%	282	6.7%
45 to 64	1791	18.6%	578	21.6%	50	6.1%	275	11.6%	931	22.0%
65 to 74	1399	14.6%	453	16.9%	56	6.8%	241	10.2%	696	16.4%
75 and older	2204	22.9%	865	32.3%	114	13.9%	314	13.3%	1003	23.7%
<b>Total</b>	<b>9615</b>	<b>100%</b>	<b>2679</b>	<b>100%</b>	<b>819</b>	<b>100%</b>	<b>2369</b>	<b>100%</b>	<b>4235</b>	<b>100%</b>

<sup>1</sup>Date of birth was missing for two patient samples and have not been included in this table.

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

<sup>3</sup>Samples are routinely tested for: influenza, RSV, adenovirus, *Mycoplasma pneumoniae*, rhinovirus, enterovirus, parainfluenza and human metapneumovirus.

**Table 2.3.3a.** *Patients testing positive for influenza in Wales, between 2017 week 40 and 2018 week 15, by hospital location and age group*

Age Group	General In & Out Patient		Urgent Care & A/E Wards		ICU Wards	
	n	%	n	%	n	%
Under 1	28	2.3%	22	1.7%	10	5.2%
1 to 4	50	4.1%	66	5.2%	2	1.0%
5 to 9	35	2.9%	37	2.9%	1	0.5%
10 to 14	25	2.0%	34	2.7%	2	1.0%
15 to 24	54	4.4%	83	6.6%	4	2.1%
25 to 34	53	4.3%	97	7.7%	8	4.2%
35 to 44	61	5.0%	101	8.0%	10	5.2%
45 to 64	212	17.3%	310	24.6%	56	29.2%
65 to 74	208	16.9%	194	15.4%	51	26.6%
75 and older	502	40.9%	315	25.0%	48	25.0%
<b>Total</b>	<b>1228</b>	<b>100%</b>	<b>1259</b>	<b>100%</b>	<b>192</b>	<b>100%</b>

**Table 2.3.3b.** *Patients testing positive for RSV in Wales, between 2017 week 40 and 2018 week 15, by hospital location and age group*

Age Group	General In & Out Patient		Urgent Care & A/E Wards		ICU Wards	
	n	%	n	%	n	%
Under 1	195	43.5%	156	52.7%	31	41.3%
1 to 4	91	20.3%	58	19.6%	3	4.0%
5 to 9	14	3.1%	4	1.4%	2	2.7%
10 to 14	1	0.2%	4	1.4%	0	0.0%
15 to 24	6	1.3%	4	1.4%	1	1.3%
25 to 34	10	2.2%	6	2.0%	1	1.3%
35 to 44	10	2.2%	2	0.7%	0	0.0%
45 to 64	26	5.8%	11	3.7%	13	17.3%
65 to 74	26	5.8%	14	4.7%	16	21.3%
75 and older	69	15.4%	37	12.5%	8	10.7%
<b>Total</b>	<b>448</b>	<b>100%</b>	<b>296</b>	<b>100%</b>	<b>75</b>	<b>100%</b>

Of all the symptomatic patients in hospitals who were tested for seasonal respiratory pathogens between 2017 week 40 and 2018 week 15, 22.9% were aged 75 years or older, 18.6% were aged 45 to 64 years and 14.6% were 65 to 74 years (Table 2.3.2), the median age of patients tested was 53 years. Age was missing for two patient samples.

For those testing positive for influenza, 32.3% were aged 75 years and older, 21.6% were aged 45 to 64 years, and 16.9% were aged 65 to 74 years, the median patient age was 64 years. The median age of patients testing positive for RSV was 14 months, 46.6% of all these patients were younger than 12 months of age, 18.6% were aged one to four years, and 13.9% were 75 years and older (Table 2.3.2).

Patients who were aged 75 years and older accounted for the highest proportion of confirmed influenza cases in general hospital wards (40.9%) and urgent care (25.0%). Patients aged 45 to 64 years accounted for the highest proportion of confirmed influenza cases in intensive care wards (29.2%) (Table 2.3.3a). Children who were aged under one year accounted for the highest proportion of confirmed cases of RSV in general hospital wards (43.5%), urgent care (52.7%), and intensive care hospital wards (41.3%) (Table 2.3.3b).

## **2.4 Hospital indicators - patients in intensive care units**

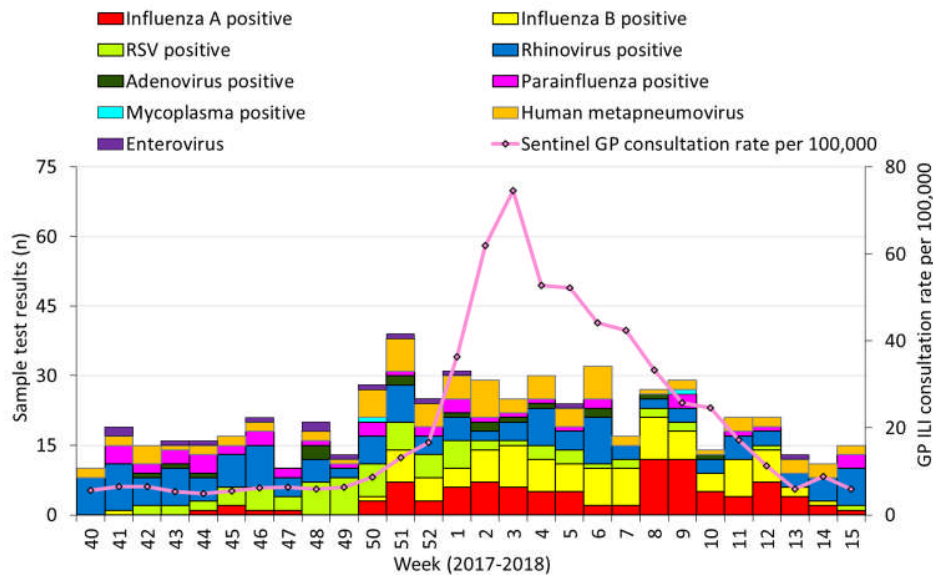
During the period 2017 week 40 to 2018 week 15 there were 1,200 samples received and tested from patients with respiratory infection symptoms in Intensive Care Units (ICU) and High Dependency Units (HDU) in Wales. Samples are routinely tested for: influenza, RSV, Adenovirus, Mycoplasma pneumoniae, rhinovirus, parainfluenza and human metapneumovirus and enteroviruses.

Of the 1,200 samples tested 16.0% (n=192) were positive for influenza, 7.3% (n=87) were positive for human metapneumovirus, 6.3% (n=75) were positive for RSV, 12.5% (n=150) were positive for rhinovirus, 3.8% (n=45) were positive for parainfluenza virus, 1.4% (n=17) were positive for adenovirus, 1.2% (n=14) were positive for enterovirus, <1% (n=2) were positive for mycoplasma, and 57.3% (n=687) were negative for all organisms routinely tested for (Figure 2.4.1, Table 2.4.1). Of the 192 patients in intensive care that tested positive for influenza, 49.0% (n=94) were positive for influenza B, 48.0% (n=92) were positive for influenza A, and 3.1% (n=6) were positive for both influenza A and influenza B. Of the influenza A samples that were further typed, 74.2% (69/93) were influenza A(H3N2) and 25.8% (24/93) were influenza A(H1N1).

Influenza B was first detected in patients in ICU in very low numbers in 2017 week 41 (week ending 15<sup>th</sup> October 2017), and was detected in patients in ICU every week between 2017 week 50 and 2018 week 14. Influenza A was first detected in 2017 week 44 (week ending 5<sup>th</sup> November 2017) and was detected in patients in ICU during most weeks until 2018 week 15. The peak in positive influenza samples from patients in intensive care wards was week 08 of 2018 (week ending 25<sup>th</sup> February 2018; 21 patient samples, 12 influenza A and nine influenza B) (Figure 2.4.1).



**Figure 2.4.1.** Results from respiratory tests carried out on samples from patients in intensive care units in Wales by Week, 2017/18



Of all the patients in ICU who were tested for seasonal respiratory pathogens between 2017 week 40 to 2018 week 15, 64.5% were 45 years and older and 18.7% were under one year of age (Table 2.4.1). The median age of patients tested was 59 years. Out of the patients testing positive for influenza A, 81.6% were aged 45 years and older and the median patient age was 65 years and of the patients testing positive for influenza B, 79.0% were aged 45 and older and the median age was 66. Of patients testing positive for RSV, 41.3% of all these patients were younger than one year of age and 49.3% were 45 and older.

**Table 2.4.1.** Samples from patients in ICU/HDU testing positive for influenza and RSV between 2017 week 40 and 2018 week 15 by age group<sup>1,2</sup>

Age Group	Samples Tested		Influenza A		Influenza B		RSV		Other		Negative	
	n	%	n	%	n	%	n	%	n	%	n	%
Under 1	224	18.7%	3	3.1%	8	8.0%	31	41.3%	69	24.1%	128	18.6%
1 to 4	30	2.5%	0	0.0%	2	2.0%	3	4.0%	18	6.3%	9	1.3%
5 to 9	13	1.1%	1	1.0%	0	0.0%	2	2.7%	7	2.4%	3	0.4%
10 to 14	10	0.8%	1	1.0%	1	1.0%	0	0.0%	5	1.7%	3	0.4%
15 to 24	32	2.7%	2	2.0%	2	2.0%	1	1.3%	6	2.1%	22	3.2%
25 to 34	59	4.9%	6	6.1%	2	2.0%	1	1.3%	11	3.8%	41	6.0%
35 to 44	57	4.8%	5	5.1%	6	6.0%	0	0.0%	15	5.2%	33	4.8%
45 to 64	281	23.4%	30	30.6%	27	27.0%	13	17.3%	50	17.5%	172	25.0%
65 to 74	271	22.6%	26	26.5%	25	25.0%	16	21.3%	64	22.4%	144	21.0%
75 and older	222	18.5%	24	24.5%	27	27.0%	8	10.7%	41	14.3%	132	19.2%
<b>Total</b>	<b>1199</b>	<b>100%</b>	<b>98</b>	<b>100%</b>	<b>100</b>	<b>100%</b>	<b>75</b>	<b>100%</b>	<b>286</b>	<b>100%</b>	<b>687</b>	<b>100%</b>

<sup>1</sup>Date of birth missing for one patient sample and has not been included in this table.

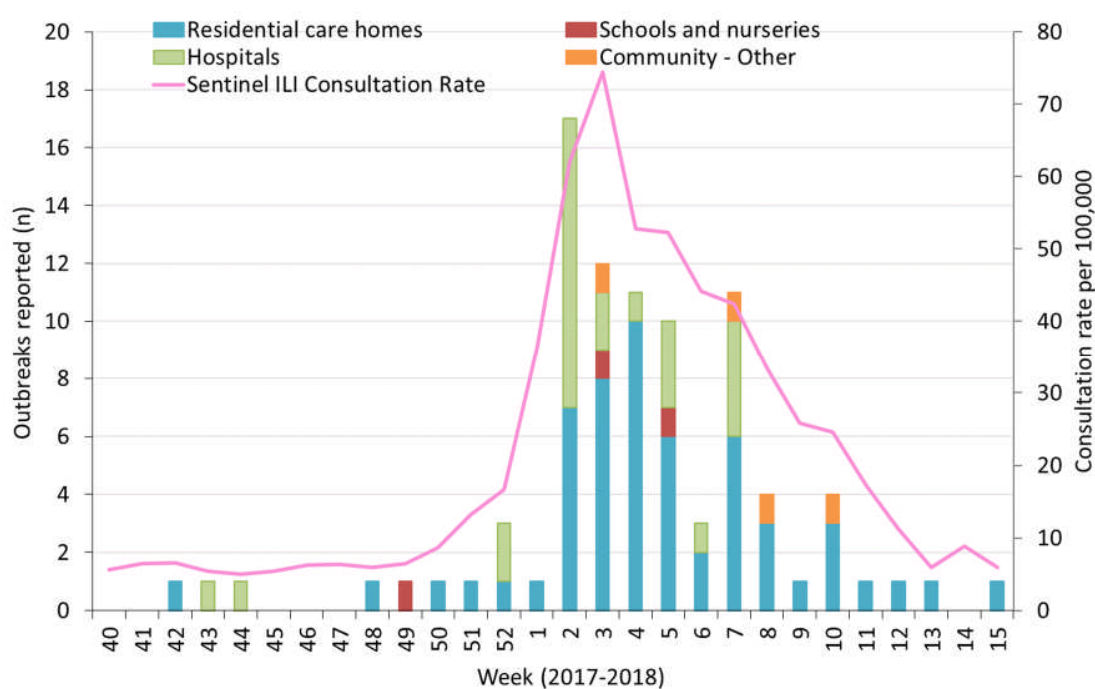
<sup>2</sup> Samples positive and negative will not add up to total screens as some individuals tested positive for more than one pathogen.

<sup>3</sup> Samples are routinely tested for: influenza, RSV, adenovirus, *Mycoplasma pneumoniae*, rhinovirus, enterovirus, parainfluenza and human metapneumovirus.

## 2.5 Outbreaks of influenza, ILI or acute respiratory illness

During the 2017/18 influenza season in Wales there were 88 outbreaks of influenza, ILI or acute respiratory illness (ARI) reported to Public Health Wales Health Protection Teams (Figure 2.5.1), compared to 49 reported outbreaks during the 2016/17 season. Outbreaks were reported from 2017 week 42 to 2018 week 15. Influenza A was laboratory confirmed in nine of the outbreaks reported this season, influenza B was confirmed in 11 of the outbreaks and mixed influenza A and B were confirmed in five outbreaks. Sixty-four percent (n=56) of the outbreaks were reported from residential care homes, 28.4% (n=25) were reported from hospital wards, 4.5% (n=4) were reported from other community settings or prisons and 3.4% (n=3) were reported from school or nursery settings. Fifty-three percent (n=47) of the outbreaks reported occurred in South East Wales (covering Aneurin Bevan UHB, Cardiff and Vale UHB and Cwm Taf UHB areas), 33.0% (n=29) of the outbreaks occurred in Mid and West Wales (covering Abertawe Bro Morgannwg UHB, Hywel Dda UHB and Powys THB), and 14.8% (n=13) of the outbreaks were reported from North Wales (covering Betsi Cadwaladr UHB).

**Figure 2.5.1.** Outbreaks of acute respiratory illness reported to Public Health Wales Health Protection Team during the 2017/18 season, and sentinel GP ILI consultation rate per 100,000



## 2.6 Excess mortality during the influenza season

Weekly seasonal excess mortality in Wales during 2017/18 was carried out using the EuroMoMo method by Public Health England [6]. All countries of the UK experienced weeks with excess mortality this season, and throughout the UK the age group where weekly excess mortality was most frequently seen were those aged 65 years and older. In Wales, excess mortality was seen in all ages during 2017 week 52 and 2018 weeks six, seven and 10. Age-group specific seasonal excesses in mortality were observed in Wales for children younger than five years during 2017 week 42 and for adults aged 65 years and older

during 2017 week 52 to 2018 week 04 and 2018 weeks six, seven and nine to 11. Based on provisional estimates and the number of weeks where seasonal excesses in mortality were observed, the 2017/18 season appeared more severe in terms of excess deaths than the 2015/16, but less severe than 2014/15.

## **3. Influenza virus characterisation, vaccine effectiveness and antivirals**

### **3.1 Laboratory characterisation of influenza viruses**

During 2017/18 next generation sequencing for influenza was introduced to enhance the virological characterisation of influenza viruses in Wales. So far, 140 viruses from across Wales have been characterised using this technique.

All of the influenza B viruses characterised belonged to the Yamagata lineage, during the 2017/18 season this lineage of influenza B was only included in the Live Attenuated Influenza Vaccine and the quadrivalent inactivated vaccine used in the UK, and not the trivalent inactivated vaccine. This meant that there was significant mismatch with the trivalent vaccine. Available evidence suggests that the trivalent vaccine offers a (reduced) degree of cross-protection even when mismatched to the circulating influenza B lineage.

Genetic characterisation of influenza A H1N1pdm09 viruses in Wales showed that they all belonged to clade 6B.1. Antigenic characterisation of similar viruses, demonstrate them to be antigenically matched to the A/Michigan/45/2015 virus included in 2017/18 Northern Hemisphere vaccines.

Characterisation of the influenza A(H3N2) viruses showed that in Wales (as in other UK countries) there was considerable genetic variation with a number of different clades and subclades detected. By the end of the season, the vast majority were shown to belong to the 3C.2a2 clade with evidence of ongoing evolution (Appendix Figure B1). Ongoing monitoring of H3N2 virus evolution is therefore recommended.

Difficulties with antigenic characterisation of the H3N2 viruses does mean that data is limited, however it has been shown that the recommended A/Singapore/INFIMH-16-0019/2016 component of the 2018/19 vaccines appears to be antigenically matched to viruses belonging to 3C.2a clades.

Antigenic characterisation of the neuraminidase genes (the target of influenza antivirals) has so far shown no evidence of the emergence of viruses with mutations that may reduce viral susceptibility to oseltamivir or zanamivir.

### **3.2 Effectiveness of the 2017/18 seasonal influenza vaccine in the UK**

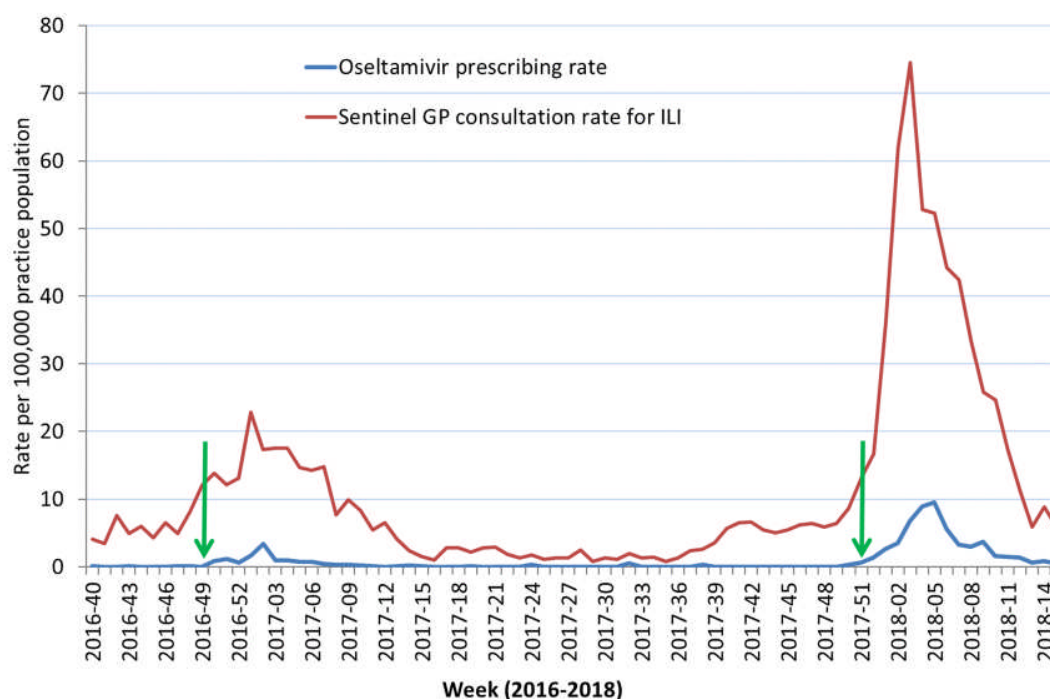
End of season estimates of influenza vaccine effectiveness in the UK are yet to be published at the time of preparation for this report. A summary published in March 2018 [7] contained information from five vaccine effectiveness studies carried out in 11 European countries, including the United Kingdom. Estimates of overall effectiveness against laboratory confirmed influenza varied from 25% to 52%, depending on study country. Estimates of effectiveness specifically against influenza A(H1N1)pdm09 varied from 55% to 68% and against influenza B varied from 36% to 54%. None of the five studies found

evidence of significant protection against influenza A(H3N2). In the USA, the overall effectiveness of influenza vaccination in preventing laboratory-confirmed influenza associated with medically attended acute respiratory illness was estimated to be 36% (95% CI: 27-44%) [8]. Effectiveness varied according to influenza type, being highest against influenza A(H1N1)pdm09 at 67% (95% CI: 54-76%) and lowest against influenza A(H3N2) at 25% (95% CI: 13-36%). Effectiveness against influenza B infection in this study was estimated at 42% (95% CI: 25-56%). The reasons for poor effectiveness of the 2017/18 influenza vaccines against influenza A(H3N2) are not fully understood, but may relate to genetic diversity within the 3c2a clade of influenza A(H3N2) viruses or potential issues of egg-adaptation in the influenza A(H3N2) vaccine virus [9].

### 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 20<sup>th</sup> December 2017 to 18<sup>th</sup> May 2018. Prescribing rates followed a similar trend to the sentinel GP consultation rate for ILI. The rate peaked at 9.5 prescriptions per 100,000 practice population during week 05 2018 (week ending 21<sup>st</sup> January, Figure 3.3.1), which was two weeks after the peak for ILI consultations in sentinel practices. The peak in prescribing rate during 2017/18 was higher than the 2016/17 peak prescribing rate in Wales (Table 3.3.1). During the 2017/18 season in the UK, most viruses were fully susceptible and only small numbers of viruses were detected with reduced sensitivity to oseltamivir or zanamivir [6].

**Figure 3.3.1.** Prescribing rate for oseltamivir per 100,000 practice population in Wales from 2016 week 40 to 2018 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 2017/18

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

## 4. Influenza immunisation in Wales 2017/18

### 4.1 Data collection

#### 4.1.1 Primary Care data

Data on influenza immunisation for the 2017/18 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 1<sup>st</sup> September 2017 and 3<sup>rd</sup> April 2018.

Data were received on a weekly basis throughout 2017/18 from GPs in Wales. If data from individual GPs were not received for a particular week, a roll-up exercise was carried out where the most recent previous submission of data from the relevant GP was identified and used. This report is based on data submitted from all 426 practices in Wales through Audit+.

Data were collected on immunisations given to those aged 65 years and older, those aged between six months and 64 years recorded as belonging to one or more clinical risk categories (in total and by specific risk category) and children aged two to three years (age on 31<sup>st</sup> August 2017). Immunisation uptake figures for pregnant women calculated from GP data represent the proportion of women whose GP records contained Read codes associated with pregnancy at any point during September 2017 to January 2018 who had received an influenza vaccine since 1<sup>st</sup> September 2017. Risk categories were based on the Read code groups defined in the [PRIMIS Seasonal Influenza Vaccine Uptake Reporting Specification for 2017/18](#) [10].

#### **4.1.2 Point of delivery survey data of coverage in pregnant women**

During January 2018 a survey was conducted with the Heads of Midwifery and midwife colleagues in all Welsh health boards of how many women delivering in the major maternity units in each health board recalled being offered influenza immunisation, and how many recalled receiving it [11]. In one health board the survey was conducted in March 2018. During the five day period information was collected from 363 women giving birth. This is the fifth year the point of delivery survey has been conducted across maternity units in Wales.

#### **4.1.3 Reception class, School Year 1, 2, 3 and 4 children (aged four to eight years) immunisation data, and children aged 3 in nursery schools in Cwm Taf UHB**

Data on uptake of Live Attenuated Intranasal Vaccine (LAIV) in schoolchildren in reception class, year 1, 2, 3 and 4 age groups (aged four to eight years as at 31<sup>st</sup> August 2017) were manually submitted by health board Immunisation Coordinators on a fortnightly basis throughout the campaign. Uptake figures represent the proportion of children that received LAIV at a school immunisation session. Data on uptake of LAIV in three year old children in nursery classes in Cwm Taf UHB were also manually submitted by the health board Immunisation Coordinator throughout the campaign as part of a nursery school based influenza immunisation pilot. 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.

#### **4.1.4 NHS staff immunisation data**

Immunisation uptake data for NHS staff were provided on a monthly basis from October 2017 to March 2018 by health board and trust occupational health departments. Denominator data were sourced at the start of the campaign from health boards 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. 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 General practice staff immunisation data**

An internet-based survey of immunisation uptake in staff working in general practices in Wales was conducted in May 2018. A link to the Public Health Wales internet site page containing the survey and explanatory information was distributed to all GP Practice Managers in Wales with a request to participate. The survey enquired about immunisation uptake, by staff group, in each of the practices and also the number of staff who had declined influenza immunisation. Submitted responses were automatically collated by the Public Health Wales internet site content management system, Cascade, provided by the NHS Wales Informatics Service.



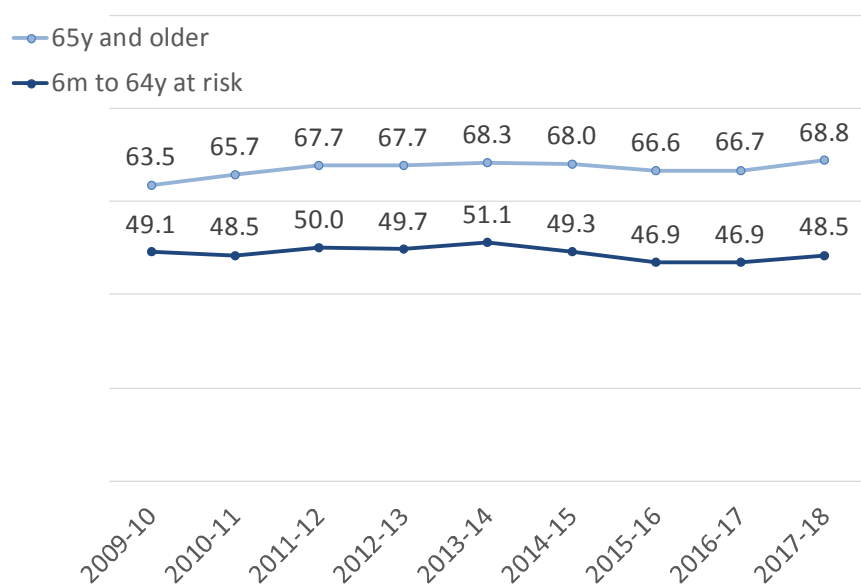
## 4.2 Influenza immunisation uptake

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

Uptake of influenza vaccine in those aged 65 years and over was 68.8%, an increase of 2.1 from 66.7% in the 2016/17 season (Figure 4.2.1). This remains below the Welsh Government target of 75%. Of all immunisations given to those aged 65 years and over, 90% were delivered by the week ending 19<sup>th</sup> November 2017 (Figure 4.2.2). Uptake varied by HB from 65.0% (Hywel Dda UHB) to 71.0% (Cardiff and Vale UHB), (Table 4.2.1, Figures 4.2.3 and 4.2.5) and ranged by Local Authority (LA) area from 61.1% (Ceredigion) to 73.4% (Monmouthshire and Wrexham) (Figure 4.2.6, Appendix Table A1). For patients aged 65 years or older, 12.5% were recorded as having declined immunisation, compared to 13.4% in the 2016/17 season. No HB or LA area achieved the 75% target.

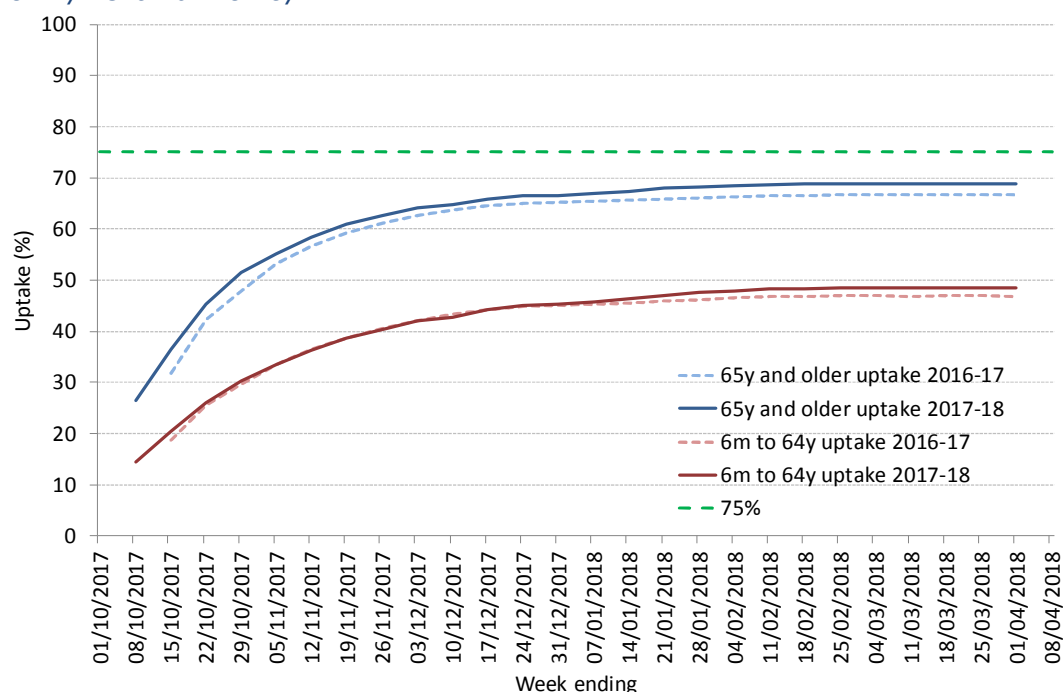
Uptake in those aged six months to 64 years in a clinical risk group was 48.5%, an increase of 1.6 from 46.9% in the 2016/17 season (Figure 4.2.1). Of all immunisations given to those aged six months to 64 years in clinical risk groups, 90% were delivered by the week ending 24<sup>th</sup> December 2017 (Figure 4.2.2). Uptake ranged by HB from 42.9% (Hywel Dda UHB) to 51.6% (Betsi Cadwaladr UHB) (Table 4.2.1, Figures 4.2.4 and 4.2.5) and by LA area from 42.2% (Carmarthenshire) to 55.3% (Monmouthshire) (Figure 4.2.6, Appendix Table A1). The proportion of all people aged six months to 64 years recorded in one or more clinical risk categories was 14.7% (an increase from 14.4% in 2016/17). Of those aged six months to 64 years in clinical risk groups, 9.6% were recorded as having declined immunisation, compared to 10.1% in 2016/17. No HB met the 55% target, and one LA met the target.

**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 – 2017/18





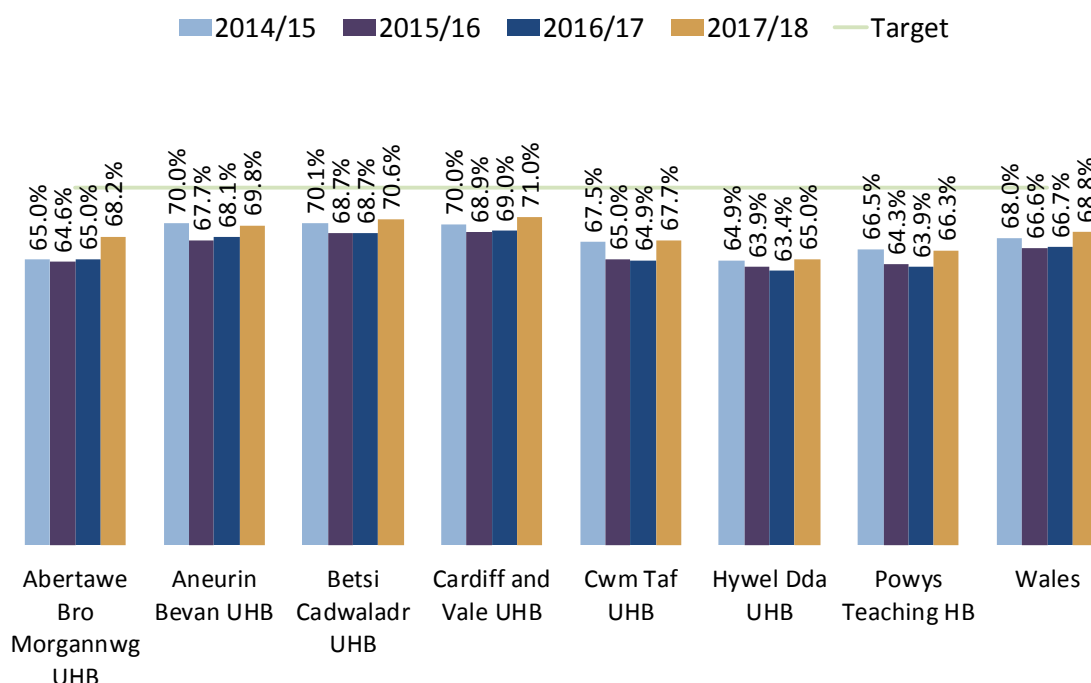
**Figure 4.2.2.** Weekly trend in uptake of influenza vaccine in patients aged 65 years and over and in those aged six months to 64 years in clinical risk groups, Wales, 2017/18 and 2016/17



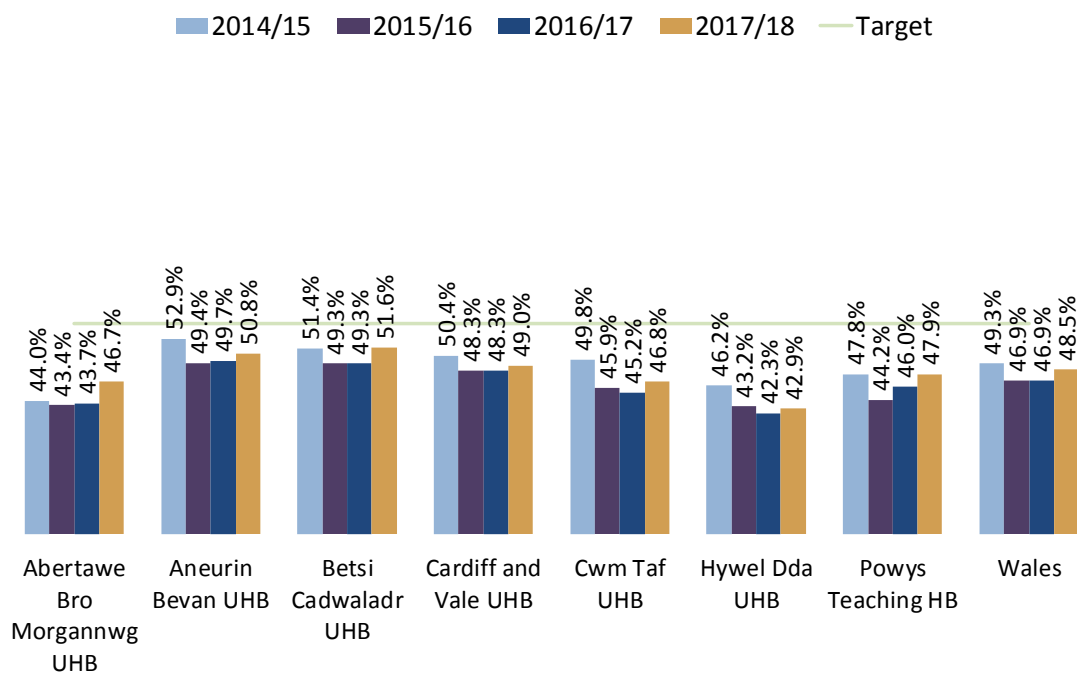
**Table 4.2.1.** Trends in uptake (%) of influenza immunisation in health boards, Wales, 2014/15 - 2017/18

Health Board	Uptake in patients aged 65y and older				Uptake in patients younger than 65y at risk			
	2014/15	2015/16	2016/17	2017/18	2014/15	2015/16	2016/17	2017/18
Abertawe Bro Morgannwg UHB	65.0	64.6	65.0	68.2	44.0	43.4	43.7	46.7
Aneurin Bevan UHB	70.0	67.7	68.1	69.8	52.9	49.4	49.7	50.8
Betsi Cadwaladr UHB	70.1	68.7	68.7	70.6	51.4	49.3	49.3	51.6
Cardiff and Vale UHB	70.0	68.9	69.0	71.0	50.4	48.3	48.3	49.0
Cwm Taf UHB	67.5	65.0	64.9	67.7	49.8	45.9	45.2	46.8
Hywel Dda UHB	64.9	63.9	63.4	65.0	46.2	43.2	42.3	42.9
Powys Teaching UHB	66.5	64.3	63.9	66.3	47.8	44.2	46.0	47.9
<b>Wales</b>	<b>68.0</b>	<b>66.6</b>	<b>66.7</b>	<b>68.8</b>	<b>49.3</b>	<b>46.9</b>	<b>46.9</b>	<b>48.5</b>

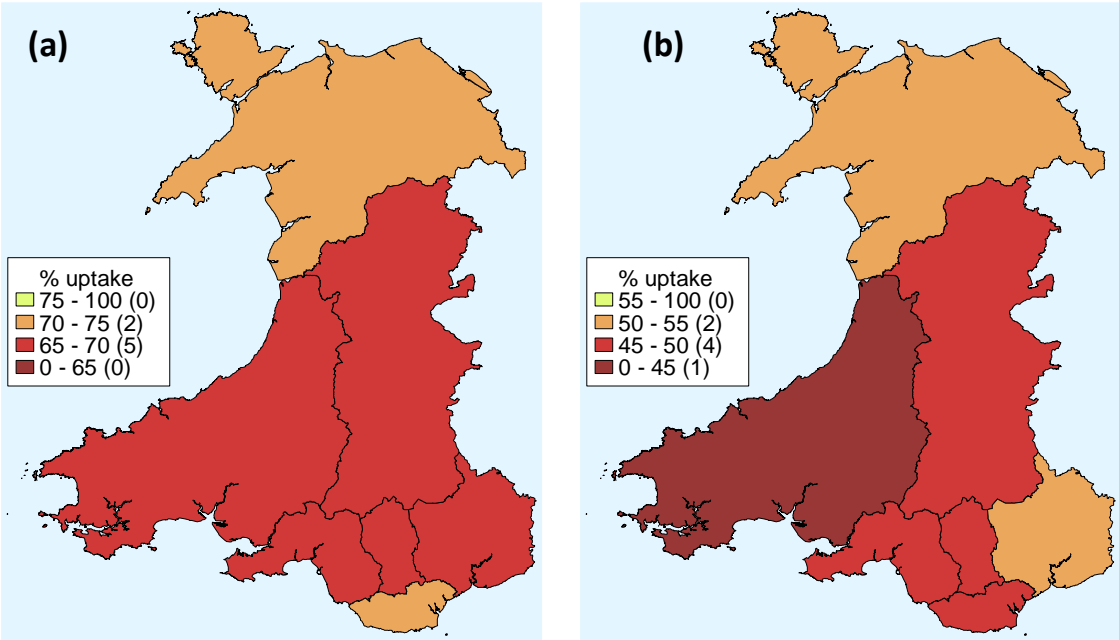
**Figure 4.2.3.** Uptake of influenza immunisation in health boards in Wales in patients aged 65 years and over, 2014/15 – 2017/18



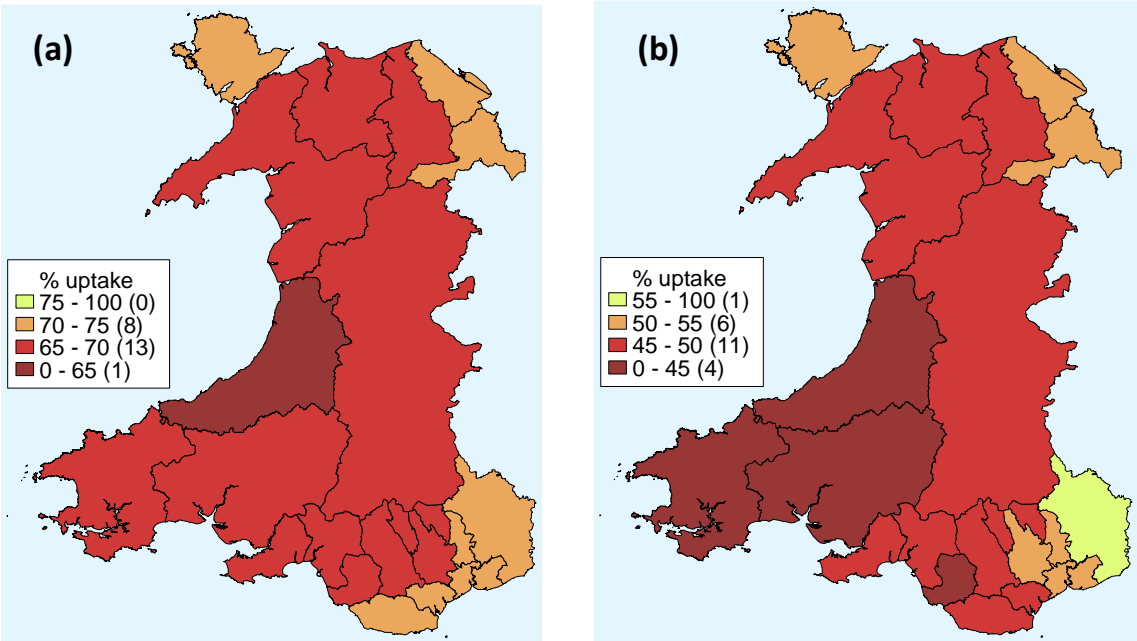
**Figure 4.2.4.** Uptake of influenza immunisation in health boards in Wales in patients aged six months to 64 years in clinical risk groups, 2014/15 – 2017/18



**Figure 4.2.5.** Uptake of influenza immunisation in general practices during 2017/18, based on targets by health board, in: (a) patients aged 65 years and over (target 75%) and (b) patients aged six months to 64 years in clinical risk groups (target 55%)



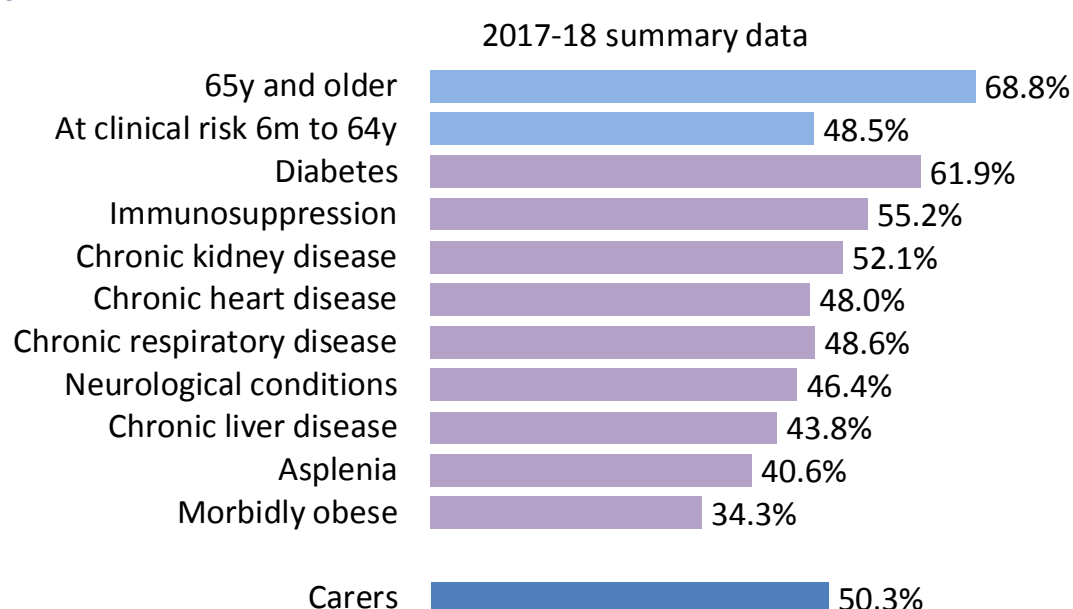
**Figure 4.2.6.** Uptake of influenza immunisation in general practices during 2017/18, based on targets by Local Authority of practice location, in: (a) patients aged 65 years and over (target 75%) and (b) patients aged six months to 64 years in clinical risk groups (target 55%)



### 4.2.2 Immunisation uptake by risk group

Uptake in those aged six months to 64 years in a clinical risk group was 48.5%. 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 48.5% 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 4.2.7.** *Influenza immunisation uptake rates in patients aged 65 years and over and six months to 64 years at risk, by individual risk group, Wales, 2017/18*



- Chronic heart disease was recorded in 2.5% of patients aged six months to 64 years, of whom 48.0% were immunised against influenza (Figure 4.2.7, Appendix Table A2). Uptake by HB ranged from 43.1% (Hywel Dda UHB) to 51.9% (Betsi Cadwaladr UHB).
- Chronic respiratory disease was recorded in 7.6% of patients aged six months to 64 years, of whom 48.6% were immunised against influenza (Figure 4.2.7, Appendix Table A2), ranging by HB from 41.5% (Hywel Dda UHB) to 51.4% (Betsi Cadwaladr UHB).
- Chronic kidney disease was recorded in 0.6% of patients aged six months to 64 years, of whom 52.1% were immunised against influenza (Figure 4.2.7, Appendix Table A2), ranging by HB from 47.0% (Cwm Taf UHB) to 56.3% (Betsi Cadwaladr UHB).
- Diabetes was recorded in 3.3% of patients aged six months to 64 years, of whom 61.9% were immunised against influenza (Figure 4.2.7, Appendix Table A2), ranging by HB from 57.9% (Hywel Dda UHB) to 64.9% (Cardiff and Vale UHB).

- Immunosuppression due to disease or treatment was recorded in 1.0% of patients aged six months to 64 years, of whom 55.2% were immunised against influenza (Figure 4.2.7, Appendix Table A2), ranging by HB from 47.9% (Cwm Taf UHB) to 61.1% (Betsi Cadwaladr UHB).
- Chronic liver disease was recorded in 0.4% of patients aged six months to 64 years, of whom 43.8% were immunised against influenza (Figure 4.2.7, Appendix Table A2), ranging by HB from 38.0% (Cwm Taf UHB) to 49.5% (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 46.4% were immunised against influenza (Figure 4.2.7, Appendix Table A2), ranging by HB from 42.0% (Hywel Dda UHB) to 50.3% (Betsi Cadwaladr UHB).
- Morbidly obese was recorded in 3.0% of patients aged six months to 64 years, of whom 34.3% were immunised against influenza (Figure 4.2.7, Appendix Table A2). Uptake ranged by HB from 29.1% (Cwm Taf UHB) to 37.8% (Betsi Cadwaladr UHB).
- Being asplenic (or having a dysfunctional spleen) was recorded in 0.4% of patients aged six months to 64 years, of whom 40.6% were immunised (Figure 4.2.7, Appendix Table A2), ranging by HB from 37.3% (Abertawe Bro Morgannwg UHB) to 44.9% (Betsi Cadwaladr UHB).
- A total of 30,333 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 50.3% were immunised against influenza (Figure 4.2.7, 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 45.7% (Hywel Dda UHB) to 53.4% (Aneurin Bevan UHB).

### 4.2.3 Uptake in pregnant women

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

1. 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.
2. 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.

From 1<sup>st</sup> September 2017 to 31<sup>st</sup> January 2018, 29,221 women were coded in GPs with Read codes associated with pregnancy. Out of these women, 3,111 (10.6%) had an existing condition within the risk groups defined by the CMO letter, the remainder (26,110) did not have another condition resulting in increased risk from influenza (Appendix Table A3). Uptake of influenza vaccination in all pregnant women, measured using GP data was 47.6% and ranged by HB from 42.6% (Hywel Dda UHB) to 53.7% (Powys THB). Uptake in pregnant women with another existing risk condition was 61.7% and ranged by HB from 52.2% (Hywel Dda UHB) to 66.3% (Betsi Cadwaladr UHB). Uptake in pregnant women without

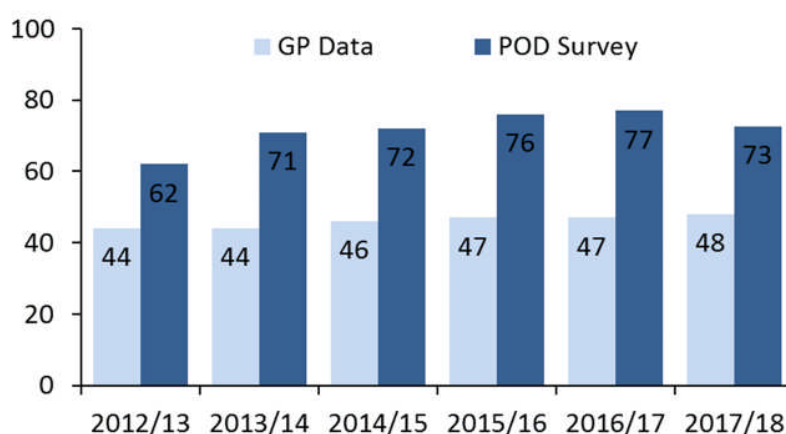
another existing risk condition was 46.0%, and ranged by HB from 41.2% (Cwm Taf UHB) to 52.2% (Powys THB).

The point of delivery survey included 363 women giving birth during a five day period in January 2018, with one health board collecting data in March 2018 [11]. Data were submitted by all health boards in Wales. Uptake of influenza immunisation recalled in this group was 72.7% (95% CI 67.8-77.2), a decrease compared to 76.8% (95% CI 72.5-80.8) last year and below the 75% vaccination target set by Welsh Government. Uptake increased in four HBs (Abertawe Bro Morgannwg UHB, Aneurin Bevan UHB, Cwm Taf UHB and Powys THB) compared to the 2016/17 survey, and decreased in three HBs (Betsi Cadwaladr UHB, Cardiff and Vale UHB and Hywel Dda UHB) [11]. The survey also found that 89.8% of the women could recall being offered influenza immunisation, a decrease of 4.3 from 94.1% last year (Table 4.2.2 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 4.2.8).

**Table 4.2.2.** Number of women offered influenza vaccine during pregnancy, Wales, 2017/18 (Data source: 2017/18 point of delivery survey)

Women offered influenza vaccination while pregnant		
	n	%
Yes	326	89.8
No	19	5.2
Not known/missing	18	5.0
<b>Total</b>	<b>363</b>	<b>100</b>

**Figure 4.2.8.** Uptake (%) of influenza vaccination in pregnant women by data source, Wales, 2012/13-2017/18



Data automatically provided by GPs through Audit+ are defined using pregnancy related Read codes, which can be problematic for this group. The denominator will include a proportion of women who have given birth, or whose pregnancy ended for other reasons, before they were offered influenza vaccination. The timeliness of notification to GPs of deliveries and subsequent update of records with

delivery Read codes is unknown; failure to update the records of pregnant women in a timely way could lead to inflation of the denominator. Until a better electronic means of collecting data on influenza immunisation uptake during pregnancy is available, data provided from midwifery services through the point of delivery survey is considered to provide the most accurate estimate of coverage in pregnant women in Wales.

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 2017/18 winter, 13,922 women whose GP record contained Read codes relating to pregnancy were recorded as having received influenza vaccination. This is an increase from the 2016/17 total of 13,410 women vaccinated.

#### 4.2.4 Uptake in children

Of a total of 69,769 children aged two and three years old as at 31 August 2017, 50.2% (n=35,057) were immunised against influenza in general practice between 1<sup>st</sup> Sept 2017 and 31<sup>st</sup> March 2018. The number of immunisations given to children aged two and three years old in general practice increased by 3,101 in 2017/18 compared to 2016/17. Uptake in two and three year olds varied by health board, ranging from 43.1% (Hywel Dda UHB) to 56.9% (Powys Teaching HB). Uptake in two year olds (51.7%) was slightly higher compared to uptake in three year olds (48.8%) (Table 4.2.3).

**Table 4.2.3. Uptake of influenza immunisation in general practice in children aged two and three years by health board, Wales, 2017/18<sup>1</sup>**

Health Board	Children aged 2 years			Children aged 3 years			Combined Uptake (%)
	Immunised (n)	Denominator (n)	Uptake (%)	Immunised (n)	Denominator (n)	Uptake (%)	
Abertawe Bro Morgannwg UHB	3106	5921	52.5	2639	5768	45.8	49.1
Aneurin Bevan UHB	3542	6996	50.6	3290	6906	47.6	49.1
Betsi Cadwaladr UHB	4079	7305	55.8	3962	7509	52.8	54.3
Cardiff and Vale UHB	3073	5974	51.4	2799	5962	46.9	49.2
Cwm Taf UHB	1722	3507	49.1	2001	3514	56.9	53.0
Hywel Dda UHB	1746	3906	44.7	1617	3896	41.5	43.1
Powys Teaching HB	745	1260	59.1	736	1345	54.7	56.9
<b>Wales</b>	<b>18013</b>	<b>34869</b>	<b>51.7</b>	<b>17044</b>	<b>34900</b>	<b>48.8</b>	<b>50.2</b>

<sup>1</sup>Children aged three years from Cwm Taf UHB were offered influenza immunisation in nurseries attached to primary schools. Data presented in Table 4.2.3 are provided by general practices and it is likely information for a small proportion of children immunised in nursery sessions in Cwm Taf UHB was not entered in to GP records. As a result, uptake presented here for three year olds in Cwm Taf UHB is likely to underestimate true uptake (see Table 4.2.4 for further information).

In Cwm Taf UHB LAIV was offered to children aged three years old in nursery classes attached to primary schools. Uptake in this group of children was 62.8% (Table 4.2.4). Of a total of 3,514 three year old children were registered with a GP in Cwm Taf UHB, compared with 3,333 (94.8%) recorded in the nursery data.

**Table 4.2.4. Uptake of influenza immunisation in children aged three years in nursery classes in Cwm Taf Health Board, 2017/18**

Health Board	Schools targeted (n)	Children aged 3 years		
		Immunised (n)	Denominator (n)	Uptake (%)
Cwm Taf UHB	131	2093	3333	62.8



All health boards provided uptake data for immunisations given to children in school.

LAIV was offered in 1,364 schools in Wales to children in reception class, and school years 1, 2, 3 and 4. Of the 179,442 eligible children who were aged four to eight years on 31<sup>st</sup> August 2017, 68.3% (122,474) were immunised against influenza. This is an increase from 66.9% in 2016/17 in eligible children immunised in schools. Uptake ranged by HB from 60.6% (Cardiff and Vale UHB) to 74.0% (Abertawe Bro Morgannwg UHB) (Table 4.2.5).

Uptake in school reception classes (children four to five years of age) increased to 68.5% (23,870/34,852) from 67.7% in the same age group last year. Uptake varied by HB, ranging from 59.0% (Cardiff and Vale UHB) to 76.3% (Powys Teaching HB) (Table 4.2.6).

Uptake in School Year 1 (children five to six years of age) increased to 69.2% (25,023/36,151) from 67.7% in the same age group last year. Uptake varied by HB, ranging from 63.8% (Cardiff and Vale UHB) to 74.5% (Abertawe Bro Morgannwg UHB) (Table 4.2.6).

Uptake in School Year 2 (children six to seven years of age) increased to 69.6% (25,552/36,711) from 66.4% in the same age group last year. Uptake varied by HB, ranging from 60.9% (Cardiff and Vale UHB) to 75.2% (Abertawe Bro Morgannwg UHB) (Table 4.2.6).

Uptake in School Year 3 (children seven to eight years of age) increased to 67.2% (24,245/36,090) from 65.7% in the same age group last year. Uptake varied by HB, ranging from 60.5% (Cardiff and Vale UHB) to 72.8% (Abertawe Bro Morgannwg UHB) (Table 4.2.6).

Uptake in School Year 4 (children eight to nine years of age) was 66.7% (23,784/35,638). Uptake varied by HB, ranging from 58.6% (Cardiff and Vale UHB) to 73.7% (Abertawe Bro Morgannwg UHB) (Table 4.2.6).

**Table 4.2.5. Uptake of influenza immunisation in school children aged four to eight years by health board, Wales, 2017/18**

Health Board	Schools targeted (n)	All children aged 4 to 8 years		
		Immunised (n)	Denominator (n)	Uptake (%)
Abertawe Bro Morgannwg UHB	189	21977	29687	74.0
Aneurin Bevan UHB	206	23147	34917	66.3
Betsi Cadwaladr UHB	391	26719	39382	67.8
Cardiff and Vale UHB	152	18192	30008	60.6
Cwm Taf UHB	131	13319	18453	72.2
Hywel Dda UHB	211	14325	20056	71.4
Powys Teaching HB	84	4781	6668	71.7
<b>Wales</b>	<b>1364</b>	<b>122460</b>	<b>179171</b>	<b>68.3</b>

**Table 4.2.6.** *Uptake of influenza immunisation in school children aged four, five, six, seven and eight years by health board, Wales, 2017/18*

Health Board	Schools targeted (n)	School Children aged:				
		4 years Uptake (%)	5 years Uptake (%)	6 years Uptake (%)	7 years Uptake (%)	8 years Uptake (%)
Abertawe Bro Morgannwg UHB	189	73.9	74.5	75.2	72.8	73.7
Aneurin Bevan UHB	206	66.9	66.5	67.8	65.5	64.7
Betsi Cadwaladr UHB	391	71.6	67.7	70.1	65.1	64.9
Cardiff and Vale UHB	152	59.0	63.8	60.9	60.5	58.6
Cwm Taf UHB	131	70.8	73.0	73.5	71.2	72.3
Hywel Dda UHB	211	71.2	72.4	72.4	71.1	69.8
Powys Teaching HB	84	76.3	73.0	70.9	69.6	69.2
<b>Wales</b>	<b>1364</b>	<b>68.5</b>	<b>69.2</b>	<b>69.6</b>	<b>67.2</b>	<b>66.7</b>

#### 4.2.5 Estimated numbers of individuals immunised in Wales in 2017/18

The estimated total number of individuals immunised against influenza was 820,183 as at 03 April 2018, based on Read coded data reported from all practices in Wales for 2017/18. This represents 25% of the estimated population of Wales.

This includes 451,346 individuals aged 65 years and over, 184,055 aged six months to 64 years in a clinical risk group, 13,922 pregnant women, 35,057 children aged two and three years and 15,262 carers. Vaccinated individuals are ascertained using Read codes which broadly correspond to eligibility criteria [10].

The remaining 120,541 immunisations were likely received by:

- Patients aged younger than 65 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 65 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 820,183 individuals immunised in 2017/18 is an increase on the estimated 761,838 individuals immunised during the 2016/17 influenza immunisation campaign [12]. 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 (60,204) was 57.9% (34,832, combined: Additional Professional Scientific and Technical, Additional Clinical Services, Allied Health Professionals, Medical and Dental, Nursing and Midwifery Registered staff groups) (Table 4.2.7). Uptake in staff with direct patient contact ranged by organisation from 39.0% (Welsh Ambulance Service NHS Trust) to 71.6% (Velindre NHS Trust). Uptake in staff groups ranged from 42.7% (Estates and Ancillary) to 67.4% (Medical and Dental, Table 4.2.8).

There were a total of 86,739 NHS HB or trust staff reported under the care of NHS Occupational Health departments in Wales and offered influenza vaccination, of whom 55.4% (n=48,074) were immunised during 2017/18, an increase of 6.2 from 49.2% in 2016/17. This is a continuation of an eight year upward trend starting from 11.6% in 2009/10. Uptake in all staff ranged by organisation from 39.7% (Welsh Ambulance Service NHS Trust) to 65.5% (Velindre NHS Trust). All HBs and NHS Trusts showed an increase in uptake compared to the previous season (Figure 4.2.9 and Figure 4.2.10).

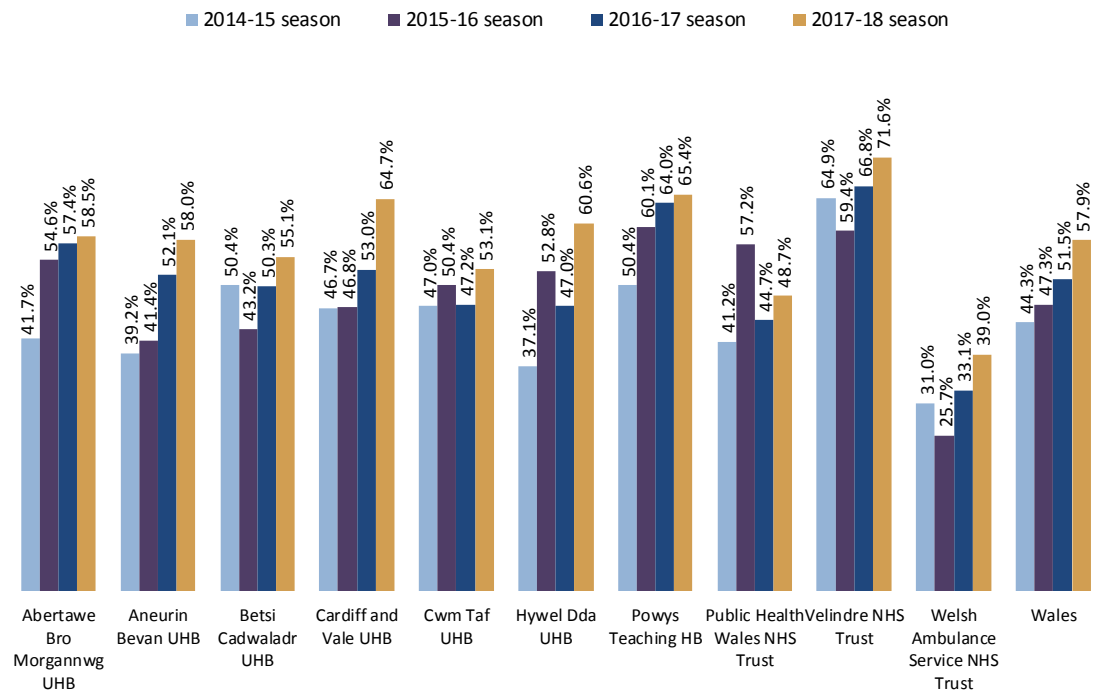
In three HBs (Cardiff and Vale UHB, Hywel Dda UHB and Powys Teaching HB) and in one NHS Trust (Velindre NHS Trust), uptake of influenza vaccination in staff with direct patient contact exceeded the Welsh Government target of 60% (Table 4.2.7).

**Table 4.2.7. Uptake of influenza immunisation in NHS staff in Wales, 2017/18**

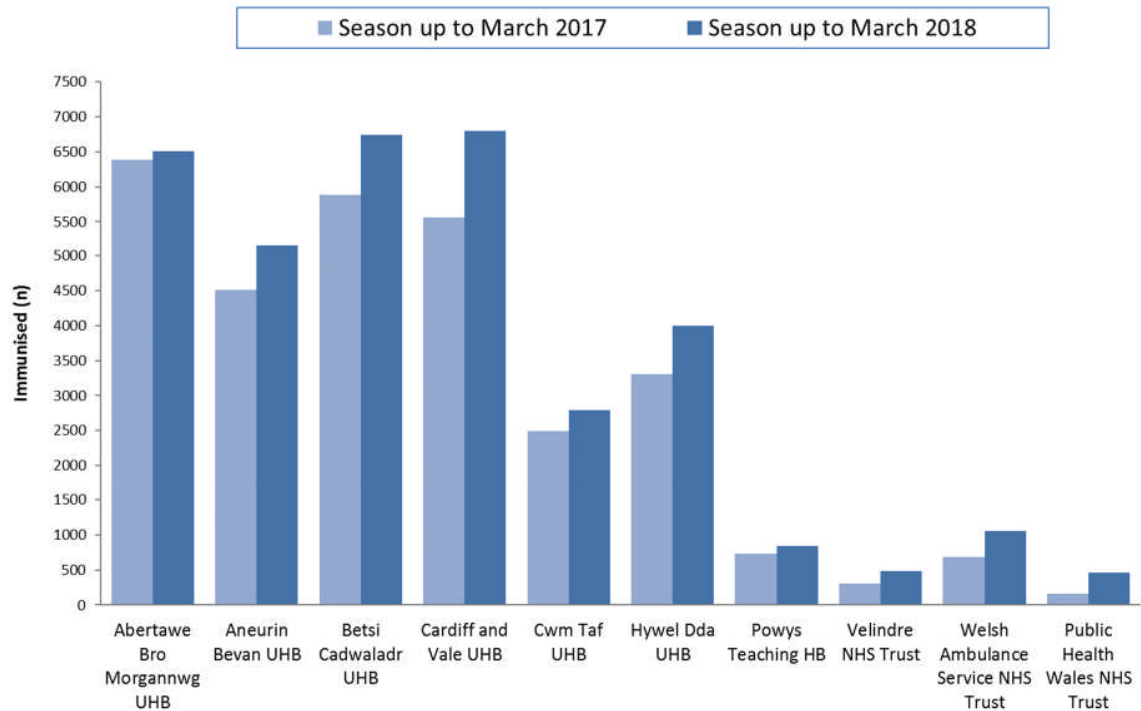
Health Board/Trust	Total Staff			Staff with direct patient contact <sup>1</sup>		
	Immunised (n)	Denominator (n)	Uptake (%)	Immunised (n)	Denominator (n)	Uptake (%)
Abertawe Bro Morgannwg UHB	9056	16028	56.5	6510	11127	58.5
Aneurin Bevan UHB	7372	12964	56.9	5147	8867	58.0
Betsi Cadwaladr UHB	9429	17452	54.0	6745	12231	55.1
Cardiff and Vale UHB	8659	14606	59.3	6797	10504	64.7
Cwm Taf UHB	4004	7996	50.1	2788	5253	53.1
Hywel Dda UHB	5328	9409	56.6	3995	6595	60.6
Powys Teaching HB	1167	1952	59.8	845	1293	65.4
Public Health Wales NHS Trust	875	1712	51.1	463	950	48.7
Velindre NHS Trust	889	1358	65.5	485	677	71.6
Welsh Ambulance Service NHS Trust	1295	3262	39.7	1057	2707	39.0
<b>Wales</b>	<b>48074</b>	<b>86739</b>	<b>55.4</b>	<b>34832</b>	<b>60204</b>	<b>57.9</b>

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

**Figure 4.2.9.** Uptake of influenza immunisation in NHS staff with direct patient contact in Wales, 2014/15 - 2017/18



**Figure 4.2.10.** Number of influenza immunisations in Welsh Health Board & NHS Trust staff with direct patient contact – seasonal comparison 2016/17 and 2017/18.



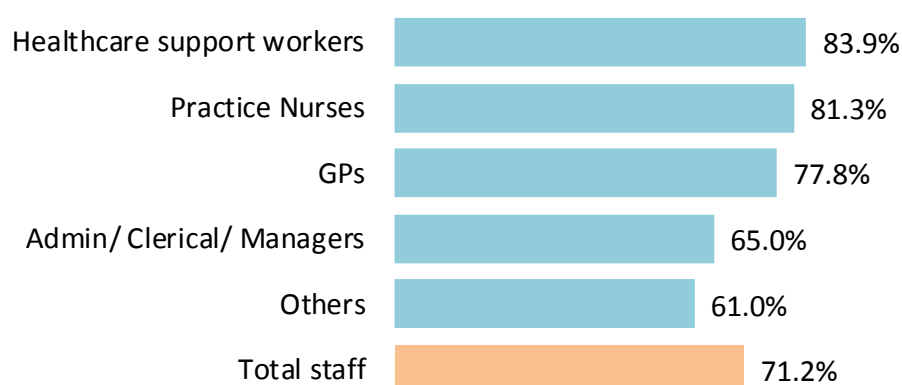
**Table 4.2.8.** *Uptake of influenza immunisation in NHS staff groups, Wales, 2017/18*

ESR staff group	Staff		
	Denominator (n)	Immunised (n)	Uptake (%)
Additional Clinical Services	17789	9165	51.5
Additional Prof Scientific and Technical	3073	1795	58.4
Administrative and Clerical	15575	8470	54.4
Allied Health Professionals	6132	3737	60.9
Estates and Ancillary	8351	3568	42.7
Healthcare Scientists	1847	792	42.9
Medical and Dental	6842	4611	67.4
Nursing & Midwifery Registered	25418	15061	59.3

#### 4.2.7 Uptake in general practice staff

In May 2018, Public Health Wales carried out an internet-based survey of influenza immunisation uptake in GP staff in Wales. The response rate for this survey was 16.4% (n=70) out of 426 practices in Wales, varying by HB from 7.8% (Hywel Dda UHB) to 19.0% (Aneurin Bevan UHB and Cardiff and Vale UHB).

Overall uptake in staff from responding practices was 71.2%. Uptake of influenza immunisation ranged by identified staff group from 65.0% (admin/clerical/managers) to 83.9% (healthcare support workers) and was 77.8% for GPs and 81.3% for practice nurses (Figure 4.2.11). Of those individuals not vaccinated, 19.2% had declined. Due to the low response rate in this survey, results must be interpreted with caution and may not be representative of GPs across Wales.

**Figure 4.2.11.** *Uptake of influenza immunisation in general practice staff - 2017/18 (based on information from 16.4% of general practices in Wales)*

### 4.2.8 Immunisations given in pharmacy

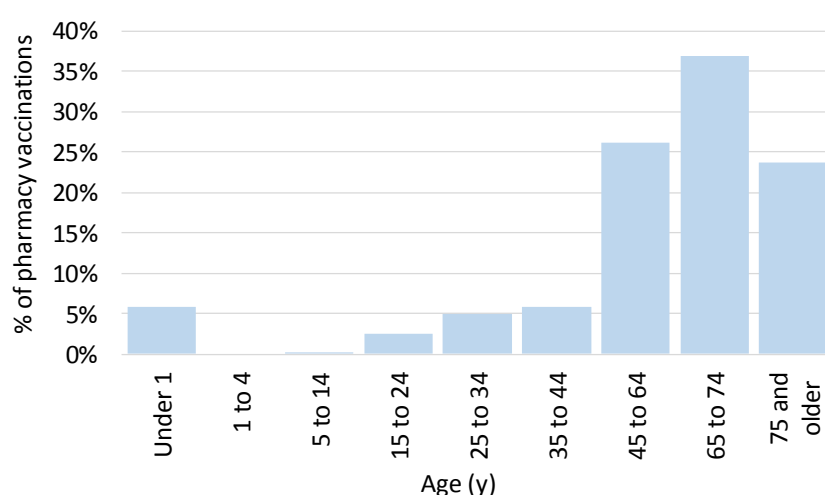
A total of 36,130 people were immunised against influenza in community pharmacies in Wales, as at 11<sup>th</sup> April 2018. The highest number of influenza immunisations given in pharmacies was in Abertawe Bro Morgannwg UHB (22.2%) whilst the lowest number of influenza immunisations given was in Powys Teaching HB (4.0%) (Table 4.2.9).

The majority of influenza immunisations were given to individuals aged 65 years and older (59.9%); whilst 31.3% of immunisations were given to those in one or more risk group (Table 4.2.10). Of the influenza immunisations given to those in a risk group, the majority were given to individuals with chronic respiratory disease (52.0%) and individuals with diabetes (22.1%) (Table 4.2.11).

**Table 4.2.9.** *Number of influenza immunisations given in community pharmacies in Wales, by health board, 2017/18*

Health board	Immunised (n)
Abertawe Bro Morgannwg UHB	8009
Aneurin Bevan UHB	5264
Betsi Cadwaladr UHB	7911
Cardiff and Vale UHB	5388
Cwm Taf UHB	2945
Hywel Dda UHB	5156
Powys Teaching HB	1457
<b>Wales</b>	<b>36130</b>

**Figure 4.2.12.** *Proportion of influenza immunisations given in community pharmacies in Wales, by age-group distribution 2017/18*



**Table 4.2.10.** Number of influenza immunisations given in community pharmacies, by eligibility group, 2017/18

Eligibility	Immunised in pharmacies		Total recorded as vaccinated in general practice databases (n) <sup>1</sup>	% of total vaccinations given through pharmacies <sup>1</sup>
	n	% of total pharmacy influenza vaccinations		
Aged 65 or over	21650	59.9	451346	4.8
Risk group	11293	31.3	184055	6.1
Carer	1845	5.1	15262	12.1
Pregnancy	627	1.7	13922	4.5
Other <sup>2</sup>	715	2.0	-	-
<b>Total</b>	<b>36130</b>	<b>100.0</b>		

<sup>1</sup> 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.

<sup>2</sup> Includes individuals who are categorised as: Community First Responder; Designated First Aider; Household contact of immunocompromised; 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 4.2.11.** Number of influenza immunisations given in community pharmacies, by risk group, 2017/18

Risk group	Immunised in pharmacies		Total recorded as vaccinated in general practice databases (n) <sup>1</sup>	% of total vaccinations given through pharmacies <sup>1</sup>
	n	% of total pharmacy influenza vaccinations		
Asplenia or splenic dysfunction	26	0.2	4435	0.6
Chronic Heart Disease	1216	10.8	31436	3.9
Chronic Kidney Disease	150	1.3	7524	2.0
Chronic Liver Disease	89	0.8	4078	2.2
Chronic Neurological Disease	510	4.5	1997	25.5
Chronic Respiratory Disease	5869	52.0	95115	6.2
Diabetes	2495	22.1	52596	4.7
Immuno-suppressed	865	7.7	14162	6.1
Morbidly obese adults	73	0.6	26530	0.3
<b>Total</b>	<b>11293</b>	<b>100.0</b>		

<sup>1</sup> 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.



## 5. Conclusions

The 2017/18 season was more intense than any since 2010/11 and has seen the largest numbers of influenza cases diagnosed and confirmed since the 2009 pandemic. The underlying reasons for this season's increased activity are probably multifactorial and may include coincidence of notable influenza A and influenza B circulation; evolving genetic diversity in influenza A(H3N2) viruses and increased case ascertainment due to media coverage before and during the influenza season.

Although a larger number of cases were seen, with high levels of intensity, severity of infection did not appear higher than previous influenza A(H3N2) seasons. In addition, the shape and length of the season was not unusual compared to previous years. Similar to previous seasons, patients attending general practices due to influenza were mainly younger to middle aged adults, whereas those in hospital with confirmed flu were more likely to be older adults and the very young.

This season saw a mismatch in the influenza B lineage virus contained in the trivalent vaccine compared to the dominant circulating type, although the quadrivalent vaccines were well matched to circulating influenza B. Most adults in Wales would have received the trivalent vaccine, but even so evidence suggests there was significant (albeit reduced) protection afforded. The 2017/18 influenza vaccines demonstrated good protection against influenza A(H1N1)pdm09 viruses, but no significant protection was seen against influenza A(H3N2) viruses. It is hoped that recommended use of adjuvanted vaccines during 2018/19 will improve effectiveness in older adults. In addition, recommended use of quadrivalent inactivated vaccine in younger adults in clinical risk groups will limit the potential for mismatch in the influenza B component of the vaccine.

More people in eligible groups in Wales received influenza vaccine this season than ever before, and uptake rates in those aged 65y are now higher than ever before. Increases in uptake were seen in healthcare staff and the childhood influenza programme, while uptake in other groups remained stable or showed small decreases. Expansion of the childhood influenza vaccination programme and improving influenza vaccination uptake in patients with clinical risk conditions remain a priority in minimising avoidable illness and mortality related to influenza.

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

Information for Health Professionals on influenza immunisation (NHS Wales only):

<http://howis.wales.nhs.uk/sites3/page.cfm?orgid=474&pid=54871>

Information on influenza:

<http://www.wales.nhs.uk/sites3/page.cfm?orgid=457&pid=27522>

General information on influenza immunisation in Wales:

<http://www.wales.nhs.uk/sites3/page.cfm?orgid=457&pid=25480>

Influenza surveillance in Wales:

<http://www.wales.nhs.uk/sites3/page.cfm?orgid=457&pid=27922>

## 7. Information about this report

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### Suggested citation

Public Health Wales Vaccine Preventable Disease Programme and Communicable Disease Surveillance Centre. Seasonal Influenza in Wales - 2017/18, June 2018. Cardiff: Public Health Wales.

## 8. Appendix A: Influenza immunisation data tables

**Table A1.** Uptake of influenza immunisation in Wales 2017/18.

Local Authority	Patients aged 65y and older			Patients aged 6m to 64y at risk			Data submission rate		
	Immunised (n)	Denominator (n)	Uptake (%)	Immunised (n)	Denominator (n)	Uptake (%)	Practices submitted (n)	Total Practices (n)	Submission rate (%)
<b><u>Abertawe Bro Morgannwg UHB</u></b>									
Bridgend LA	22,227	31,740	70.0	8,992	19,965	45.0	16	16	100.0
Neath Port Talbot LA	19,619	29,005	67.6	8,641	17,652	49.0	20	20	100.0
Swansea LA	33,208	49,256	67.4	13,573	29,207	46.5	33	33	100.0
<b>Health Board Total</b>	<b>75,054</b>	<b>110,001</b>	<b>68.2</b>	<b>31,206</b>	<b>66,824</b>	<b>46.7</b>	<b>69</b>	<b>69</b>	<b>100.0</b>
<b><u>Aneurin Bevan UHB</u></b>									
Blaenau Gwent LA	9,491	14,313	66.3	4,688	9,635	48.7	11	11	100.0
Caerphilly LA	24,273	36,265	66.9	11,361	22,659	50.1	24	24	100.0
Monmouthshire LA	17,701	24,104	73.4	6,218	11,239	55.3	13	13	100.0
Newport LA	18,856	26,507	71.1	9,019	17,920	50.3	18	18	100.0
Torfaen LA	13,570	18,997	71.4	6,277	12,537	50.1	13	13	100.0
<b>Health Board Total</b>	<b>83,891</b>	<b>120,186</b>	<b>69.8</b>	<b>37,563</b>	<b>73,990</b>	<b>50.8</b>	<b>79</b>	<b>79</b>	<b>100.0</b>
<b><u>Betsi Cadwaladr UHB</u></b>									
Anglesey LA	11,761	16,429	71.6	4,366	8,132	53.7	11	11	100.0
Conwy LA	20,898	30,394	68.8	6,378	13,132	48.6	18	18	100.0
Denbighshire LA	16,600	24,232	68.5	6,012	12,530	48.0	14	14	100.0
Flintshire LA	22,882	31,345	73.0	9,775	17,787	55.0	22	22	100.0
Gwynedd LA	18,746	27,495	68.2	6,719	13,807	48.7	21	21	100.0
Wrexham LA	21,243	28,930	73.4	9,353	17,247	54.2	21	21	100.0
<b>Health Board Total</b>	<b>112,130</b>	<b>158,825</b>	<b>70.6</b>	<b>42,603</b>	<b>82,635</b>	<b>51.6</b>	<b>107</b>	<b>107</b>	<b>100.0</b>
<b><u>Cardiff and Vale UHB</u></b>									
Cardiff LA	37,671	53,308	70.7	21,239	43,006	49.4	48	48	100.0
Vale of Glamorgan LA	18,780	26,240	71.6	6,959	14,547	47.8	15	15	100.0
<b>Health Board Total</b>	<b>56,451</b>	<b>79,548</b>	<b>71.0</b>	<b>28,198</b>	<b>57,553</b>	<b>49.0</b>	<b>63</b>	<b>63</b>	<b>100.0</b>
<b><u>Cwm Taf UHB</u></b>									
Merthyr Tydfil LA	7,541	10,992	68.6	3,496	7,655	45.7	9	9	100.0
Rhondda Cynon Taff LA	31,661	46,916	67.5	14,219	30,187	47.1	32	32	100.0
<b>Health Board Total</b>	<b>39,202</b>	<b>57,908</b>	<b>67.7</b>	<b>17,715</b>	<b>37,842</b>	<b>46.8</b>	<b>41</b>	<b>41</b>	<b>100.0</b>
<b><u>Hywel Dda UHB</u></b>									
Carmarthenshire LA	27,027	40,922	66.0	8,907	21,104	42.2	23	23	100.0
Ceredigion LA	13,739	22,475	61.1	4,136	9,606	43.1	14	14	100.0
Pembrokeshire LA	19,703	29,622	66.5	6,289	14,351	43.8	14	14	100.0
<b>Health Board Total</b>	<b>60,469</b>	<b>93,019</b>	<b>65.0</b>	<b>19,332</b>	<b>45,061</b>	<b>42.9</b>	<b>51</b>	<b>51</b>	<b>100.0</b>
<b><u>Powys Teaching HB</u></b>	<b>24,149</b>	<b>36,415</b>	<b>66.3</b>	<b>7,438</b>	<b>15,544</b>	<b>47.9</b>	<b>16</b>	<b>16</b>	<b>100.0</b>
<b>Wales Total</b>	<b>451,346</b>	<b>655,902</b>	<b>68.8</b>	<b>184,055</b>	<b>379,449</b>	<b>48.5</b>	<b>426</b>	<b>426</b>	<b>100.0</b>

**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 2017/18.

Local Authority	Total patients aged 6m to 64y	Chronic heart disease				Chronic respiratory disease				Chronic kidney disease				Diabetes			
		With condition (n)	(%)	Immunised (n)	Uptake (%)	With condition (n)	(%)	Immunised (n)	Uptake (%)	With condition (n)	(%)	Immunised (n)	Uptake (%)	With condition (n)	(%)	Immunised (n)	Uptake (%)
<b><u>Abertawe Bro Morgannwg UHB</u></b>																	
Bridgend LA	126,739	3,907	3.1	1,765	45.2	9,997	7.9	4,539	45.4	907	0.7	430	47.4	4,602	3.6	2,694	58.5
Neath Port Talbot LA	110,236	3,253	3.0	1,592	48.9	8,938	8.1	4,378	49.0	1,012	0.9	523	51.7	4,231	3.8	2,596	61.4
Swansea LA	205,907	5,109	2.5	2,316	45.3	15,132	7.3	7,155	47.3	941	0.5	452	48.0	6,508	3.2	3,918	60.2
<b>Health Board Total</b>	<b>442,882</b>	<b>12,269</b>	<b>2.8</b>	<b>5,673</b>	<b>46.2</b>	<b>34,067</b>	<b>7.7</b>	<b>16,072</b>	<b>47.2</b>	<b>2,860</b>	<b>0.6</b>	<b>1,405</b>	<b>49.1</b>	<b>15,341</b>	<b>3.5</b>	<b>9,208</b>	<b>60.0</b>
<b><u>Aneurin Bevan UHB</u></b>																	
Blaenau Gwent LA	58,767	1,623	2.8	800	49.3	4,865	8.3	2,421	49.8	413	0.7	205	49.6	2,441	4.2	1,450	59.4
Caerphilly LA	153,926	3,983	2.6	2,010	50.5	11,240	7.3	5,692	50.6	746	0.5	415	55.6	5,723	3.7	3,675	64.2
Monmouthshire LA	76,809	1,961	2.6	1,063	54.2	5,680	7.4	3,170	55.8	453	0.6	276	60.9	2,364	3.1	1,598	67.6
Newport LA	130,142	2,870	2.2	1,432	49.9	8,893	6.8	4,519	50.8	622	0.5	334	53.7	4,655	3.6	2,875	61.8
Torfaen LA	76,405	2,239	2.9	1,104	49.3	6,485	8.5	3,243	50.0	381	0.5	211	55.4	2,859	3.7	1,737	60.8
<b>Health Board Total</b>	<b>496,049</b>	<b>12,676</b>	<b>2.6</b>	<b>6,409</b>	<b>50.6</b>	<b>37,163</b>	<b>7.5</b>	<b>19,045</b>	<b>51.2</b>	<b>2,615</b>	<b>0.5</b>	<b>1,441</b>	<b>55.1</b>	<b>18,042</b>	<b>3.6</b>	<b>11,335</b>	<b>62.8</b>
<b><u>Betsi Cadwaladr UHB</u></b>																	
Anglesey LA	49,367	1,186	2.4	645	54.4	4,573	9.3	2,413	52.8	285	0.6	163	57.2	1,636	3.3	1,087	66.4
Conwy LA	87,450	2,236	2.6	1,075	48.1	6,859	7.8	3,376	49.2	523	0.6	274	52.4	2,720	3.1	1,641	60.3
Denbighshire LA	79,627	2,159	2.7	1,087	50.3	6,687	8.4	3,190	47.7	470	0.6	259	55.1	2,612	3.3	1,531	58.6
Flintshire LA	122,089	2,965	2.4	1,638	55.2	9,348	7.7	5,108	54.6	668	0.5	399	59.7	3,767	3.1	2,517	66.8
Gwynedd LA	98,117	2,097	2.1	1,028	49.0	7,542	7.7	3,636	48.2	580	0.6	296	51.0	2,650	2.7	1,616	61.0
Wrexham LA	119,821	2,992	2.5	1,609	53.8	9,160	7.6	4,959	54.1	701	0.6	426	60.8	3,649	3.0	2,378	65.2
<b>Health Board Total</b>	<b>556,471</b>	<b>13,635</b>	<b>2.5</b>	<b>7,082</b>	<b>51.9</b>	<b>44,169</b>	<b>7.9</b>	<b>22,682</b>	<b>51.4</b>	<b>3,227</b>	<b>0.6</b>	<b>1,817</b>	<b>56.3</b>	<b>17,034</b>	<b>3.1</b>	<b>10,770</b>	<b>63.2</b>
<b><u>Cardiff and Vale UHB</u></b>																	
Cardiff LA	335,259	6,669	2.0	3,172	47.6	22,851	6.8	11,255	49.3	1,308	0.4	698	53.4	9,575	2.9	6,235	65.1
Vale of Glamorgan LA	102,650	2,465	2.4	1,139	46.2	7,560	7.4	3,569	47.2	491	0.5	253	51.5	2,996	2.9	1,924	64.2
<b>Health Board Total</b>	<b>437,909</b>	<b>9,134</b>	<b>2.1</b>	<b>4,311</b>	<b>47.2</b>	<b>30,411</b>	<b>6.9</b>	<b>14,824</b>	<b>48.7</b>	<b>1,799</b>	<b>0.4</b>	<b>951</b>	<b>52.9</b>	<b>12,571</b>	<b>2.9</b>	<b>8,159</b>	<b>64.9</b>
<b><u>Cwm Taf UHB</u></b>																	
Merthyr Tydfil LA	49,980	1,459	2.9	646	44.3	3,883	7.8	1,876	48.3	266	0.5	113	42.5	1,840	3.7	1,060	57.6
Rhondda Cynon Taff LA	199,608	5,171	2.6	2,441	47.2	15,398	7.7	7,372	47.9	1,365	0.7	653	47.8	7,146	3.6	4,475	62.6
<b>Health Board Total</b>	<b>249,588</b>	<b>6,630</b>	<b>2.7</b>	<b>3,087</b>	<b>46.6</b>	<b>19,281</b>	<b>7.7</b>	<b>9,248</b>	<b>48.0</b>	<b>1,631</b>	<b>0.7</b>	<b>766</b>	<b>47.0</b>	<b>8,986</b>	<b>3.6</b>	<b>5,535</b>	<b>61.6</b>
<b><u>Hywel Dda UHB</u></b>																	
Carmarthenshire LA	138,586	3,838	2.8	1,610	41.9	10,748	7.8	4,445	41.4	736	0.5	340	46.2	4,804	3.5	2,710	56.4
Ceredigion LA	72,559	1,745	2.4	774	44.4	4,794	6.6	1,979	41.3	371	0.5	194	52.3	2,054	2.8	1,212	59.0
Pembrokeshire LA	90,296	2,592	2.9	1,141	44.0	7,166	7.9	3,000	41.9	551	0.6	277	50.3	2,987	3.3	1,774	59.4
<b>Health Board Total</b>	<b>301,441</b>	<b>8,175</b>	<b>2.7</b>	<b>3,525</b>	<b>43.1</b>	<b>22,708</b>	<b>7.5</b>	<b>9,424</b>	<b>41.5</b>	<b>1,658</b>	<b>0.6</b>	<b>811</b>	<b>48.9</b>	<b>9,845</b>	<b>3.3</b>	<b>5,696</b>	<b>57.9</b>
<b><u>Powys Teaching HB</u></b>																	
	<b>103,567</b>	<b>2,984</b>	<b>2.9</b>	<b>1,349</b>	<b>45.2</b>	<b>7,805</b>	<b>7.5</b>	<b>3,820</b>	<b>48.9</b>	<b>649</b>	<b>0.6</b>	<b>333</b>	<b>51.3</b>	<b>3,087</b>	<b>3.0</b>	<b>1,893</b>	<b>61.3</b>
<b><u>Wales Total</u></b>																	
<b>Wales Total</b>	<b>2,587,907</b>	<b>65,503</b>	<b>2.5</b>	<b>31,436</b>	<b>48.0</b>	<b>195,604</b>	<b>7.6</b>	<b>95,115</b>	<b>48.6</b>	<b>14,439</b>	<b>0.6</b>	<b>7,524</b>	<b>52.1</b>	<b>84,906</b>	<b>3.3</b>	<b>52,596</b>	<b>61.9</b>

**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 2017/18.

Local Authority	Total patients aged 6m to 64y	Immuno-supression				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 (%)
<b>Abertawe Bro Morgannwg UHB</b>																					
Bridgend LA	126,739	1,018	0.8	495	48.6	454	0.4	183	40.3	2,054	1.6	922	44.9	4,223	3.3	1,329	31.5	519	0.4	191	36.8
Neath Port Talbot LA	110,236	895	0.8	481	53.7	407	0.4	203	49.9	1,747	1.6	867	49.6	4,152	3.8	1,563	37.6	406	0.4	175	43.1
Swansea LA	205,907	1,610	0.8	739	45.9	829	0.4	357	43.1	2,958	1.4	1,331	45.0	5,714	2.8	1,837	32.1	819	0.4	285	34.8
Health Board Total	442,882	3,523	0.8	1,715	48.7	1,690	0.4	743	44.0	6,759	1.5	3,120	46.2	14,089	3.2	4,729	33.6	1,744	0.4	651	37.3
<b>Aneurin Bevan UHB</b>																					
Blaenau Gwent LA	58,767	738	1.3	431	58.4	274	0.5	111	40.5	918	1.6	402	43.8	2,355	4.0	770	32.7	231	0.4	90	39.0
Caerphilly LA	153,926	1,585	1.0	868	54.8	531	0.3	206	38.8	2,185	1.4	996	45.6	5,751	3.7	1,798	31.3	613	0.4	254	41.4
Monmouthshire LA	76,809	840	1.1	519	61.8	246	0.3	133	54.1	1,125	1.5	602	53.5	2,112	2.7	896	42.4	386	0.5	179	46.4
Newport LA	130,142	1,280	1.0	718	56.1	434	0.3	178	41.0	1,669	1.3	784	47.0	4,142	3.2	1,403	33.9	506	0.4	183	36.2
Torfaen LA	76,405	904	1.2	562	62.2	307	0.4	156	50.8	1,245	1.6	600	48.2	2,639	3.5	1,030	39.0	383	0.5	177	46.2
Health Board Total	496,049	5,347	1.1	3,098	57.9	1,792	0.4	784	43.8	7,142	1.4	3,384	47.4	16,999	3.4	5,897	34.7	2,119	0.4	883	41.7
<b>Betsi Cadwaladr UHB</b>																					
Anglesey LA	49,367	638	1.3	427	66.9	184	0.4	93	50.5	781	1.6	414	53.0	1,538	3.1	634	41.2	211	0.4	104	49.3
Conwy LA	87,450	896	1.0	502	56.0	352	0.4	144	40.9	1,287	1.5	600	46.6	2,256	2.6	785	34.8	422	0.5	161	38.2
Denbighshire LA	79,627	904	1.1	519	57.4	316	0.4	137	43.4	1,248	1.6	596	47.8	2,128	2.7	815	38.3	372	0.5	155	41.7
Flintshire LA	122,089	1,335	1.1	849	63.6	435	0.4	228	52.4	1,500	1.2	805	53.7	3,375	2.8	1,333	39.5	548	0.4	268	48.9
Gwynedd LA	98,117	1,078	1.1	673	62.4	338	0.3	143	42.3	1,188	1.2	559	47.1	2,325	2.4	845	36.3	379	0.4	154	40.6
Wrexham LA	119,821	1,187	1.0	718	60.5	412	0.3	186	45.1	1,484	1.2	796	53.6	3,621	3.0	1,357	37.5	517	0.4	257	49.7
Health Board Total	556,471	6,038	1.1	3,688	61.1	2,037	0.4	931	45.7	7,488	1.3	3,770	50.3	15,243	2.7	5,769	37.8	2,449	0.4	1,099	44.9
<b>Cardiff and Vale UHB</b>																					
Cardiff LA	335,259	2,964	0.9	1,611	54.4	961	0.3	440	45.8	3,803	1.1	1,781	46.8	7,384	2.2	2,704	36.6	1,459	0.4	557	38.2
Vale of Glamorgan LA	102,650	970	0.9	533	54.9	279	0.3	131	47.0	1,442	1.4	672	46.6	2,681	2.6	968	36.1	486	0.5	195	40.1
Health Board Total	437,909	3,934	0.9	2,144	54.5	1,240	0.3	571	46.0	5,245	1.2	2,453	46.8	10,065	2.3	3,672	36.5	1,945	0.4	752	38.7
<b>Cwm Taf UHB</b>																					
Merthyr Tydfil LA	49,980	444	0.9	167	37.6	195	0.4	66	33.8	779	1.6	323	41.5	1,870	3.7	509	27.2	180	0.4	67	37.2
Rhondda Cynon Taff LA	199,608	2,018	1.0	1,012	50.1	833	0.4	325	39.0	2,911	1.5	1,258	43.2	7,567	3.8	2,238	29.6	733	0.4	300	40.9
Health Board Total	249,588	2,462	1.0	1,179	47.9	1,028	0.4	391	38.0	3,690	1.5	1,581	42.8	9,437	3.8	2,747	29.1	913	0.4	367	40.2
<b>Hywel Dda UHB</b>																					
Carmarthenshire LA	138,586	1,351	1.0	664	49.1	447	0.3	168	37.6	2,257	1.6	939	41.6	4,416	3.2	1,325	30.0	520	0.4	194	37.3
Ceredigion LA	72,559	683	0.9	348	51.0	227	0.3	92	40.5	966	1.3	415	43.0	1,777	2.4	565	31.8	302	0.4	104	34.4
Pembrokeshire LA	90,296	1,180	1.3	677	57.4	513	0.6	235	45.8	1,535	1.7	643	41.9	2,607	2.9	903	34.6	440	0.5	176	40.0
Health Board Total	301,441	3,214	1.1	1,689	52.6	1,187	0.4	495	41.7	4,758	1.6	1,997	42.0	8,800	2.9	2,793	31.7	1,262	0.4	474	37.6
<b>Powys Teaching HB</b>																					
	103,567	1,115	1.1	649	58.2	329	0.3	163	49.5	1,630	1.6	714	43.8	2,645	2.6	923	34.9	483	0.5	209	43.3
<b>Wales Total</b>																					
	2,587,907	25,633	1.0	14,162	55.2	9,303	0.4	4,078	43.8	36,712	1.4	17,019	46.4	77,278	3.0	26,530	34.3	10,915	0.4	4,435	40.6

**Table A3.** Uptake of influenza immunisation in pregnant women, with breakdown for those who have another clinical risk condition in Wales 2017/18.

Local Authority	Pregnant women with clinical risk			Pregnant women without clinical risk			Total pregnant women		
	Immunised (n)	Denominator (n)	Uptake (%)	Immunised (n)	Denominator (n)	Uptake (%)	Immunised (n)	Denominator (n)	Uptake (%)
<b><u>Abertawe Bro Morgannwg UHB</u></b>									
Bridgend LA	86	180	47.8	510	1,377	37.0	596	1,557	38.3
Neath Port Talbot LA	60	106	56.6	413	865	47.7	473	971	48.7
Swansea LA	129	207	62.3	713	1,662	42.9	842	1,869	45.1
<b>Health Board Total</b>	<b>275</b>	<b>493</b>	<b>55.8</b>	<b>1,636</b>	<b>3,904</b>	<b>41.9</b>	<b>1,911</b>	<b>4,397</b>	<b>43.5</b>
<b><u>Aneurin Bevan UHB</u></b>									
Blaenau Gwent LA	52	82	63.4	265	662	40.0	317	744	42.6
Caerphilly LA	93	130	71.5	544	1,206	45.1	637	1,336	47.7
Monmouthshire LA	61	86	70.9	413	768	53.8	474	854	55.5
Newport LA	101	182	55.5	657	1,591	41.3	758	1,773	42.8
Torfaen LA	56	98	57.1	379	836	45.3	435	934	46.6
<b>Health Board Total</b>	<b>363</b>	<b>578</b>	<b>62.8</b>	<b>2,258</b>	<b>5,063</b>	<b>44.6</b>	<b>2,621</b>	<b>5,641</b>	<b>46.5</b>
<b><u>Betsi Cadwaladr UHB</u></b>									
Anglesey LA	56	86	65.1	356	642	55.5	412	728	56.6
Conwy LA	76	118	64.4	466	973	47.9	542	1,091	49.7
Denbighshire LA	75	123	61.0	486	943	51.5	561	1,066	52.6
Flintshire LA	123	171	71.9	696	1,333	52.2	819	1,504	54.5
Gwynedd LA	92	144	63.9	617	1,187	52.0	709	1,331	53.3
Wrexham LA	120	175	68.6	715	1,494	47.9	835	1,669	50.0
<b>Health Board Total</b>	<b>542</b>	<b>817</b>	<b>66.3</b>	<b>3,336</b>	<b>6,572</b>	<b>50.8</b>	<b>3,878</b>	<b>7,389</b>	<b>52.5</b>
<b><u>Cardiff and Vale UHB</u></b>									
Cardiff LA	273	422	64.7	1,768	3,817	46.3	2,041	4,239	48.1
Vale of Glamorgan LA	81	117	69.2	492	960	51.3	573	1,077	53.2
<b>Health Board Total</b>	<b>354</b>	<b>539</b>	<b>65.7</b>	<b>2,260</b>	<b>4,777</b>	<b>47.3</b>	<b>2,614</b>	<b>5,316</b>	<b>49.2</b>
<b><u>Cwm Taf UHB</u></b>									
Merthyr Tydfil LA	27	56	48.2	194	519	37.4	221	575	38.4
Rhondda Cynon Taff LA	103	169	60.9	662	1,558	42.5	765	1,727	44.3
<b>Health Board Total</b>	<b>130</b>	<b>225</b>	<b>57.8</b>	<b>856</b>	<b>2,077</b>	<b>41.2</b>	<b>986</b>	<b>2,302</b>	<b>42.8</b>
<b><u>Hywel Dda UHB</u></b>									
Carmarthenshire LA	62	126	49.2	530	1,173	45.2	592	1,299	45.6
Ceredigion LA	33	63	52.4	214	597	35.8	247	660	37.4
Pembrokeshire LA	61	110	55.5	365	902	40.5	426	1,012	42.1
<b>Health Board Total</b>	<b>156</b>	<b>299</b>	<b>52.2</b>	<b>1,109</b>	<b>2,672</b>	<b>41.5</b>	<b>1,265</b>	<b>2,971</b>	<b>42.6</b>
<b><u>Powys Teaching HB</u></b>	<b>101</b>	<b>160</b>	<b>63.1</b>	<b>546</b>	<b>1,045</b>	<b>52.2</b>	<b>647</b>	<b>1,205</b>	<b>53.7</b>
<b>Wales Total</b>	<b>1,921</b>	<b>3,111</b>	<b>61.7</b>	<b>12,001</b>	<b>26,110</b>	<b>46.0</b>	<b>13,922</b>	<b>29,221</b>	<b>47.6</b>



**Table A4.** Uptake of influenza immunisation in those aged six months to 64 years and recorded as being a carer in Wales 2017/18.

Local Authority	Total carers		
	Immunised (n)	Denominator (n)	Uptake (%)
<b><u>Abertawe Bro Morgannwg UHB</u></b>			
Bridgend LA	574	1,131	50.8
Neath Port Talbot LA	559	959	58.3
Swansea LA	755	1,681	44.9
<b>Health Board Total</b>	<b>1,888</b>	<b>3,771</b>	<b>50.1</b>
<b><u>Aneurin Bevan UHB</u></b>			
Blaenau Gwent LA	246	449	54.8
Caerphilly LA	728	1,385	52.6
Monmouthshire LA	783	1,340	58.4
Newport LA	777	1,708	45.5
Torfaen LA	704	1,185	59.4
<b>Health Board Total</b>	<b>3,238</b>	<b>6,067</b>	<b>53.4</b>
<b><u>Betsi Cadwaladr UHB</u></b>			
Anglesey LA	533	882	60.4
Conwy LA	563	1,206	46.7
Denbighshire LA	677	1,370	49.4
Flintshire LA	974	2,002	48.7
Gwynedd LA	620	1,122	55.3
Wrexham LA	1,057	2,096	50.4
<b>Health Board Total</b>	<b>4,424</b>	<b>8,678</b>	<b>51.0</b>
<b><u>Cardiff and Vale UHB</u></b>			
Cardiff LA	1,143	2,264	50.5
Vale of Glamorgan LA	458	975	47.0
<b>Health Board Total</b>	<b>1,601</b>	<b>3,239</b>	<b>49.4</b>
<b><u>Cwm Taf UHB</u></b>			
Merthyr Tydfil LA	170	310	54.8
Rhondda Cynon Taff LA	1,001	1,949	51.4
<b>Health Board Total</b>	<b>1,171</b>	<b>2,259</b>	<b>51.8</b>
<b><u>Hywel Dda UHB</u></b>			
Carmarthenshire LA	1,022	2,050	49.9
Ceredigion LA	507	1,112	45.6
Pembrokeshire LA	794	1,920	41.4
<b>Health Board Total</b>	<b>2,323</b>	<b>5,082</b>	<b>45.7</b>
<b><u>Powys Teaching HB</u></b>	<b>617</b>	<b>1,237</b>	<b>49.9</b>
<b>Wales Total</b>	<b>15,262</b>	<b>30,333</b>	<b>50.3</b>

**Table A5.** Uptake of influenza immunisation, through general practice, in children aged two and three years in Wales 2017/18.

Local Authority	Two year olds			Three year olds		
	Immunised (n)	Denominator (n)	Uptake (%)	Immunised (n)	Denominator (n)	Uptake (%)
<b><u>Abertawe Bro Morgannwg UHB</u></b>						
Bridgend LA	941	1,776	53.0	817	1,722	47.4
Neath Port Talbot LA	798	1,485	53.7	702	1,455	48.2
Swansea LA	1,367	2,660	51.4	1,120	2,591	43.2
<b>Health Board Total</b>	<b>3,106</b>	<b>5,921</b>	<b>52.5</b>	<b>2,639</b>	<b>5,768</b>	<b>45.8</b>
<b><u>Aneurin Bevan UHB</u></b>						
Blaenau Gwent LA	360	782	46.0	356	834	42.7
Caerphilly LA	1,114	2,165	51.5	997	2,103	47.4
Monmouthshire LA	566	970	58.4	512	917	55.8
Newport LA	975	2,054	47.5	910	1,987	45.8
Torfaen LA	527	1,025	51.4	515	1,065	48.4
<b>Health Board Total</b>	<b>3,542</b>	<b>6,996</b>	<b>50.6</b>	<b>3,290</b>	<b>6,906</b>	<b>47.6</b>
<b><u>Betsi Cadwaladr UHB</u></b>						
Anglesey LA	377	659	57.2	384	702	54.7
Conwy LA	610	1,117	54.6	582	1,115	52.2
Denbighshire LA	545	1,121	48.6	515	1,119	46.0
Flintshire LA	947	1,566	60.5	927	1,620	57.2
Gwynedd LA	680	1,201	56.6	637	1,265	50.4
Wrexham LA	920	1,641	56.1	917	1,688	54.3
<b>Health Board Total</b>	<b>4,079</b>	<b>7,305</b>	<b>55.8</b>	<b>3,962</b>	<b>7,509</b>	<b>52.8</b>
<b><u>Cardiff and Vale UHB</u></b>						
Cardiff LA	2,283	4,529	50.4	2,084	4,569	45.6
Vale of Glamorgan LA	790	1,445	54.7	715	1,393	51.3
<b>Health Board Total</b>	<b>3,073</b>	<b>5,974</b>	<b>51.4</b>	<b>2,799</b>	<b>5,962</b>	<b>46.9</b>
<b><u>Cwm Taf UHB</u></b>						
Merthyr Tydfil LA	312	765	40.8	374	743	50.3
Rhondda Cynon Taff LA	1,410	2,742	51.4	1,627	2,771	58.7
<b>Health Board Total</b>	<b>1,722</b>	<b>3,507</b>	<b>49.1</b>	<b>2,001</b>	<b>3,514</b>	<b>56.9</b>
<b><u>Hywel Dda UHB</u></b>						
Carmarthenshire LA	904	1,869	48.4	795	1,834	43.3
Ceredigion LA	358	804	44.5	337	806	41.8
Pembrokeshire LA	484	1,233	39.3	485	1,256	38.6
<b>Health Board Total</b>	<b>1,746</b>	<b>3,906</b>	<b>44.7</b>	<b>1,617</b>	<b>3,896</b>	<b>41.5</b>
<b><u>Powys Teaching HB</u></b>						
	<b>745</b>	<b>1,260</b>	<b>59.1</b>	<b>736</b>	<b>1,345</b>	<b>54.7</b>
<b>Wales Total</b>	<b>18,013</b>	<b>34,869</b>	<b>51.7</b>	<b>17,044</b>	<b>34,900</b>	<b>48.8</b>

## Appendix B: Additional and health board level influenza surveillance data

**Table B1.** Number and cumulative rate of influenza-like illness diagnosed in all general practices in Wales between 2017 week 40 and 2018 week 20, by health board.

Health Board	Influenza-like illness clinically diagnosed	
	n	Rate per 100,000 practice population
Abertawe Bro Morgannwg UHB	2521	454.3
Aneurin Bevan UHB	2769	499.2
Betsi Cadwaladr UHB	4225	654.2
Cardiff & Vale UHB	2911	602.8
Cwm Taf UHB	1411	465.9
Hywel Dda UHB	2277	619.9
Powys Teaching HB	543	475.9
<b>Wales</b>	<b>16657</b>	<b>551.1</b>

**Table B2.** General inpatient and outpatient hospital ward patients providing samples for respiratory screen testing, with numbers testing positive for influenza, RSV and other pathogens, Wales 2017/18, by health board.

Health Board	All screens		Influenza A		Influenza B		RSV		Other pathogens		Negative	
	n	%	n	%	n	%	n	%	n	%	n	%
Abertawe Bro Morgannwg UHB	595	12.5	105	15.6	104	17.5	44	9.82	97	8.1	278	13.1
Aneurin Bevan UHB	320	6.7	61	9.0	58	9.8	21	4.69	65	5.4	141	6.6
Betsi Cadwaladr UHB	429	9.0	114	16.9	79	13.3	37	8.26	113	9.4	131	6.2
Cardiff & Vale UHB	2581	54.2	259	38.4	216	36.4	279	62.28	770	64.1	1191	56.1
Cwm Taf UHB	134	2.8	11	1.6	15	2.5	17	3.79	35	2.9	60	2.8
Hywel Dda UHB	685	14.4	123	18.2	121	20.4	50	11.16	118	9.8	312	14.7
Powys Teaching HB	16	0.3	2	0.3	1	0.2	0	0.00	3	0.2	11	0.5
<b>Wales</b>	<b>4760</b>	<b>100.0</b>	<b>675</b>	<b>100.0</b>	<b>594</b>	<b>100.0</b>	<b>448</b>	<b>100.0</b>	<b>1201</b>	<b>100.0</b>	<b>2124</b>	<b>100.0</b>

<sup>1</sup> Samples positive and negative will not add up to total screens as some individuals tested positive for more than one pathogen.

<sup>2</sup> Samples are routinely tested for: influenza, RSV, adenovirus, *Mycoplasma pneumoniae*, rhinovirus, enterovirus, parainfluenza and human metapneumovirus.

**Table B3.** Accident and Emergency ward patients providing samples for respiratory screen testing, with numbers testing positive for influenza, RSV and other pathogens, Wales 2017/18, by health board.

Health Board	All screens		Influenza A		Influenza B		RSV		Other pathogens		Negative	
	n	%	n	%	n	%	n	%	n	%	n	%
Abertawe Bro Morgannwg UHB	812	22.2	89	15.5	132	18.4	142	47.97	272	30.8	256	18.0
Aneurin Bevan UHB	236	6.5	51	8.9	72	10.0	7	2.36	44	5.0	79	5.5
Betsi Cadwaladr UHB	348	9.5	89	15.5	103	14.3	17	5.74	38	4.3	124	8.7
Cardiff & Vale UHB	1461	40.0	221	38.6	231	32.2	110	37.16	442	50.1	561	39.4
Cwm Taf UHB	61	1.7	13	2.3	18	2.5	2	0.68	6	0.7	23	1.6
Hywel Dda UHB	739	20.2	110	19.2	162	22.6	18	6.08	80	9.1	381	26.8
Powys Teaching HB	0	0.0	0	0.0	0	0.0	0	0.00	0	0.0	0	0.0
<b>Wales</b>	<b>3657</b>	<b>100.0</b>	<b>573</b>	<b>100.0</b>	<b>718</b>	<b>100.0</b>	<b>296</b>	<b>100.0</b>	<b>882</b>	<b>100.0</b>	<b>1424</b>	<b>100.0</b>

<sup>1</sup> Samples positive and negative will not add up to total screens as some individuals tested positive for more than one pathogen.

<sup>2</sup> Samples are routinely tested for: influenza, RSV, adenovirus, *Mycoplasma pneumoniae*, rhinovirus, enterovirus, parainfluenza and human metapneumovirus.

**Table B4.** ICU/ HDU ward patients providing samples for respiratory screen testing, with numbers testing positive for influenza, RSV and other pathogens, Wales 2017/18, by health board.

Health Board	All screens		Influenza A		Influenza B		RSV		Other pathogens		Negative	
	n	%	n	%	n	%	n	%	n	%	n	%
Abertawe Bro Morgannwg UHB	374	31.2	30	30.6	34	34.0	16	21.33	85	29.6	219	31.9
Aneurin Bevan UHB	111	9.3	15	15.3	10	10.0	9	12.00	20	7.0	66	9.6
Betsi Cadwaladr UHB	112	9.3	13	13.3	9	9.0	2	2.67	24	8.4	69	10.0
Cardiff & Vale UHB	356	29.7	12	12.2	25	25.0	39	52.00	115	40.1	182	26.5
Cwm Taf UHB	45	3.8	7	7.1	4	4.0	1	1.33	6	2.1	29	4.2
Hywel Dda UHB	202	16.8	21	21.4	18	18.0	8	10.67	37	12.9	122	17.8
Powys Teaching HB	0	0.0	0	0.0	0	0.0	0	0.00	0	0.0	0	0.0
<b>Wales</b>	<b>1200</b>	<b>100.0</b>	<b>98</b>	<b>100.0</b>	<b>100</b>	<b>100.0</b>	<b>75</b>	<b>100.0</b>	<b>287</b>	<b>100.0</b>	<b>687</b>	<b>100.0</b>

<sup>1</sup> Samples positive and negative will not add up to total screens as some individuals tested positive for more than one pathogen.

<sup>2</sup> Samples are routinely tested for: influenza, RSV, adenovirus, *Mycoplasma pneumoniae*, rhinovirus, enterovirus, parainfluenza and human metapneumovirus.

**Table B5.** Numbers of patients tested and confirmed with influenza, by location of patient at time of sampling in 2017/18, by age group.

Sample Location	Under 1	1 to 4	5 to 9	10 to 14	15 to 24	25 to 34	35 to 44	45 to 64	65 to 74	75 and older
Sentinel surveillance practices	1	1	3	14	10	9	12	44	11	3
Non-sentinel practices	0	3	7	11	23	41	27	74	26	34
A&E Wards	22	66	37	34	83	97	101	310	194	315
Other Hospital Wards	28	50	35	25	54	53	61	212	208	502
Intensive care wards	10	2	1	2	4	8	10	56	51	48
Unknown location	2	5	0	2	5	6	2	13	8	15

**Table B6.** Numbers of patients tested and confirmed with RSV, by location of patient at time of sampling in 2017/18, by age group.

Sample Location	Under 1	1 to 4	5 to 9	10 to 14	15 to 24	25 to 34	35 to 44	45 to 64	65 to 74	75 and older
Sentinel surveillance practices	0	0	0	0	1	3	0	3	1	0
Non-sentinel practices	0	1	0	0	1	2	1	2	1	1
A&E Wards	156	58	4	4	4	6	2	11	14	37
Other Hospital Wards	195	91	14	1	6	10	10	26	26	69
Intensive care wards	31	3	2	0	1	1	0	13	16	8
Unknown location	3	0	0	0	0	0	0	0	0	1

**Table B7.** Numbers of patients providing samples for respiratory screen testing, by location of patient at time of sampling in 2017/18, by age group.

Sample Location	Under 1	1 to 4	5 to 9	10 to 14	15 to 24	25 to 34	35 to 44	45 to 64	65 to 74	75 and older
Sentinel surveillance practices	1	1	5	18	23	21	18	62	16	6
Non-sentinel practices	0	11	11	13	41	50	39	89	30	53
A&E Wards	466	368	90	55	130	163	139	414	288	449
Other Hospital Wards	535	433	130	54	115	123	113	385	341	763
Intensive care wards	117	27	11	7	11	21	26	121	136	104
Unknown location	12	11	1	3	5	10	6	21	11	22

**Figure B1.** Phylogenetic tree showing full haemagglutinin sequence relationship of H3N2 influenza A viruses detected from across Wales 2017/18.

