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Seasonal influenza in Wales 2016/17 Annual Report

Summary

The 2016/17 influenza season in Wales arrived and peaked earlier than the previous two seasons and reached moderate levels. Influenza virus was detected by sentinel GPs in the community each week from early December 2016 until the end of March 2017 and clinical consultation rates in general practice exceeded the threshold for seasonal activity from early December 2016 until mid-February 2017. Consultation rates for influenza-like illness (ILI) in general practice, and the number of confirmed hospital cases, were slightly lower compared to those seen during 2015/16, the season peaked 10 weeks earlier and was slightly shorter in duration. There were 49 outbreaks of ILI or acute respiratory illness reported to the Public Health Wales Health Protection Team from care home and hospital settings. GP consultation rates for ILI were highest in younger and middle-age adults, whereas higher proportions of older adults and the elderly were diagnosed in hospital with confirmed influenza.

Influenza A(H3N2) was the dominant virus throughout the 2016/17 season, with only small numbers of influenza B and influenza A(H1N1)pdm09 cases seen. Although some mutations were seen throughout the season, influenza A(H3N2) viruses appeared genetically matched to the type contained in the 2016/17 Northern Hemisphere influenza vaccine. The final estimate for vaccine effectiveness against influenza in the United Kingdom during the 2016/17 season was not available at the time this report was prepared, but vaccine effectiveness was reported in USA as 42% and in Europe as 38% by the USA Centers for Disease Control and Prevention and the European I-MOVE Group respectively.

More individuals than ever in clinical risk and priority groups in Wales received an influenza vaccine during 2016/17, 24% of the estimated population of Wales. Uptake in those aged 65 years and older was 66.7% and uptake for those in clinical risk groups was 46.9%. Although uptake remained stable compared to the previous season, the number of individuals eligible for and receiving influenza vaccine has increased. This season the childhood influenza vaccination programme was extended to include children aged two to seven years, uptake in two and three year olds increased to 45.3% and was 66.9% in the older children. Coverage of influenza vaccination in pregnant women was 76.8%, measured by an annual point of delivery (post-natal) survey, and exceeded the 75% target for the second year. In front-line NHS staff uptake was 51.5% and continued on a long term positive trend, for the first time exceeding the Welsh Government target of 50%.

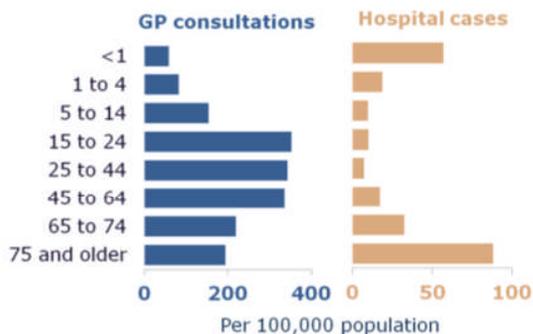
INFLUENZA SEASON IN WALES 2016/17

Dominant type of influenza A(H3N2)



2016/17 season was similar to previous years, although slightly shorter

Age of those affected by influenza



49 outbreaks
53% in hospital wards
47% in care homes

An estimated 124,000 people have symptoms in the peak weeks

6994 patients diagnosed with influenza-like illness by GPs

671 patients confirmed with influenza in hospitals

74 patients confirmed with influenza in intensive care units

Influenza vaccine uptake

67%

65 and over

47%

Under 65 at risk

77%

Pregnant women

45%

Children aged 2-3

67%

Children aged 4-7

52%

NHS staff with patient contact



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

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Key Findings

- The 2016/17 influenza season was broadly similar to recent influenza seasons. Consultation rates with GPs for ILI were highest in younger to middle age adults, but older patients were more likely to be confirmed cases of influenza in hospitals.
 - Around 4% of the population report symptomatic influenza-like illness (ILI) flu during the peak two weeks of seasonal flu activity, based on previous surveys, indicating around 124,000 people with flu symptoms at the peak of activity in Wales. However, the number of people with ILI symptoms who access health services is lower.
 - A total of 6,994 patients with ILI were reported by general practices in Wales throughout the season. Consultation rates were highest in patients aged 15 to 24 years (352 per 100,000 for the season), in contrast to the last influenza A(H3N2) season in 2014/15 where consultation rates were highest in patients aged 45 to 64 years (376 per 100,000).
 - From 2016 week 40 to 2017 week 14, 671 patients in hospitals were confirmed to have influenza, 74 of whom were in intensive care units.
 - Forty-nine outbreaks of ILI or acute respiratory illness were reported to Public Health Wales, 53% were in hospitals and 47% in care homes.
 - 2016/17 saw lower levels of seasonal excess mortality than 2014/15 (when influenza A(H3N2) last predominated), and a higher number of outbreaks reported compared to 2015/16.
- The season was dominated by influenza A(H3N2), which usually affects older adults and the elderly more severely. Only a very small number of influenza B cases were seen in Wales in 2016/17. The season started and finished earlier than the 2015/16 season in Wales.
- Circulating influenza A(H3) viruses appeared genetically similar to the virus strains included in the 2016/17 Northern Hemisphere seasonal influenza vaccines. Influenza A(H3) viruses characterised in Wales mainly belonged to the 3C.2a1 cluster. Difficulties in cultivating influenza A(H3) viruses detected throughout the UK have meant that very limited information is available regarding the antigenic match to vaccine strains.
- Vaccine effectiveness studies in the USA and in Europe reported effectiveness as 42% (95% CI: 35-48%) and 38% (95% CI: 21-51%) respectively. Results from the equivalent UK study are awaited.
- The antiviral prescribing rate peaked at 4.1 per 100,000 practice population during week 2 2017, the highest rate since 2010/11; most viruses were fully sensitive with small numbers with reduced sensitivity to oseltamivir or zanamivir.
- More influenza vaccinations were given in Wales during 2016/17 than ever before, however percentage uptake in the population remained stable in people aged 65 years and over, and also in younger patients with a clinical risk.

- Influenza vaccine uptake in those aged 65 years and older in Wales was 66.7%, compared to 66.6% last season.
 - Uptake of influenza vaccine in people aged six months to 64 years in a clinical risk group was 46.9% again this season.
 - Uptake among clinical risk groups was highest in people with diabetes (60.9%) and lowest in the morbidly obese (31.0%).
 - Uptake of influenza vaccine in pregnant women who gave birth during January 2017 was 76.8% (measured in an annual survey of women in major maternity units), an increase from 75.6% last year and above the 75% target.
 - 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 49.2%.
- Community pharmacies across Wales provided 26,889 influenza vaccinations through the NHS community pharmacy influenza service in 2016/17. This represents an estimated 4% of vaccinations given to people who were 65 years and older or in a clinical risk group.
 - Uptake of influenza vaccine in children aged two and three years, mainly immunised in general practices, was 45.3% compared to 44.4% in 2015/16.
 - Uptake of influenza vaccine in children aged four to seven years, immunised in schools, was 66.9%, compared to 63.4% in four to six year olds during 2015/16.
 - 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 51.5% exceeding 50% for the first time at a national level and in five health boards and one NHS Trust. Uptake in all NHS staff was 49.2% during 2016/17, an increase of 3.2 from 46.0% last season.
 - This is the seventh 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 99.8% 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 in general practice was 761,838 for 2016/17, compared to an estimated 730,246 last season, an increase of 4%. This represents 24% of the estimated total population of Wales who were vaccinated against influenza.

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+ general practice 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.

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 2016/17, 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, both 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; and 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 2016/17, 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 health and social care workers.

The Welsh Government influenza immunisation target was 75% uptake for people aged 65 years and over, those aged between six months and 64 years in clinical risk groups and pregnant women [1]. For NHS staff with direct patient contact, the target was 50% uptake.

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 2014/15 the programme was extended to also include all four year old children 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). In 2016, the programme was further expanded to include children aged seven years old, (as at 31 August 2016) in the schools programme [1]. During 2016/17, all children aged two to seven (up to School Year 3) were recommended to receive LAIV. 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 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. Vaccination delivery in reception class and School Years 1, 2, and 3 (the four to seven 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 are not a measure of all those who have been immunised during the course of the immunisation campaign, they record coverage in Welsh residents who are registered with a GP in Wales as at April 18th.

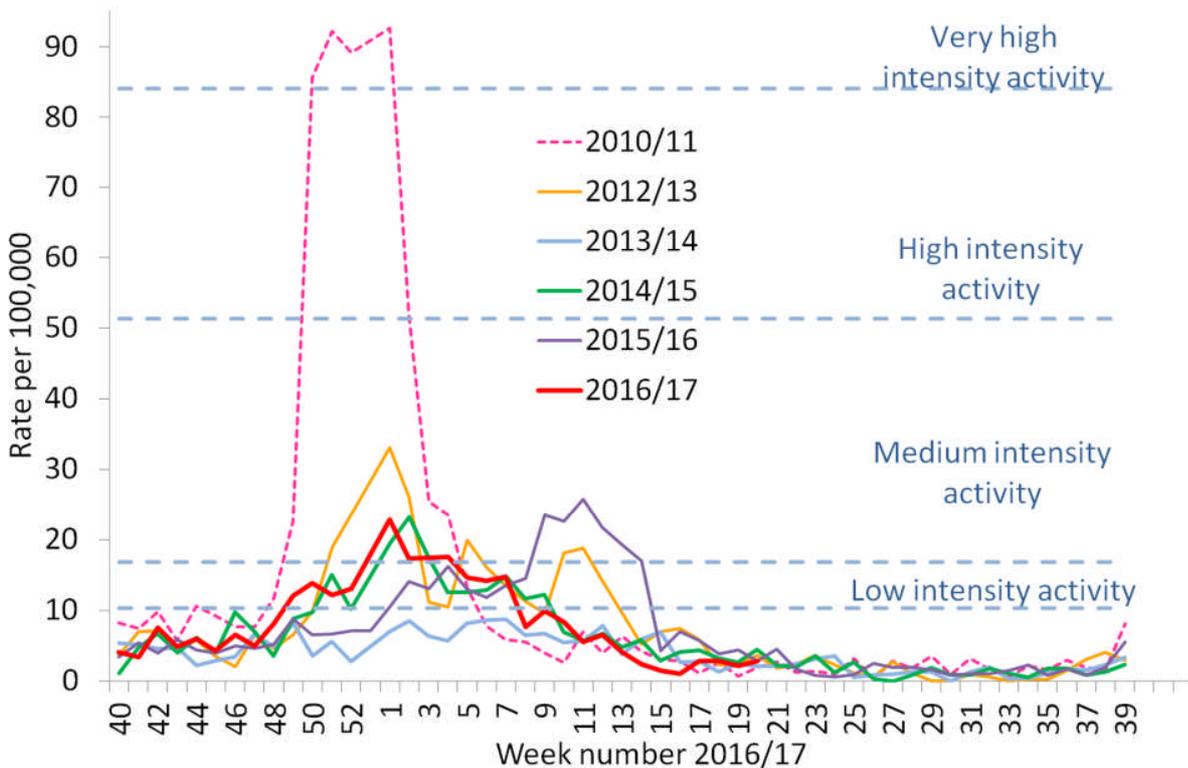
2. Influenza Surveillance in 2016/17

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

A Moving Epidemic Method (MEM) threshold [3] of 10.3 ILI consultations per 100,000 was used as one of the indicators that influenza may be circulating in the community. The GP MEM threshold for medium intensity activity was 16.8, high intensity activity was 51.3 and very high intensity activity was 84.0 consultations.

The sentinel GP MEM threshold was first reached during week 49 of 2016 (Figure 2.1.1); this and 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 2016/17



The sentinel GP ILI consultation rate exceeded the threshold for medium levels of intensity in week one, at this time virological surveillance data indicated influenza activity was predominantly due to influenza A(H3). ILI consultation rate peaked in week one at 21.1 per 100,000 practice population per week. The rate remained above the medium intensity level from week one to week four 2017. During week eight 2017 the sentinel GP ILI consultation rate returned below the threshold for low intensity seasonal influenza activity.

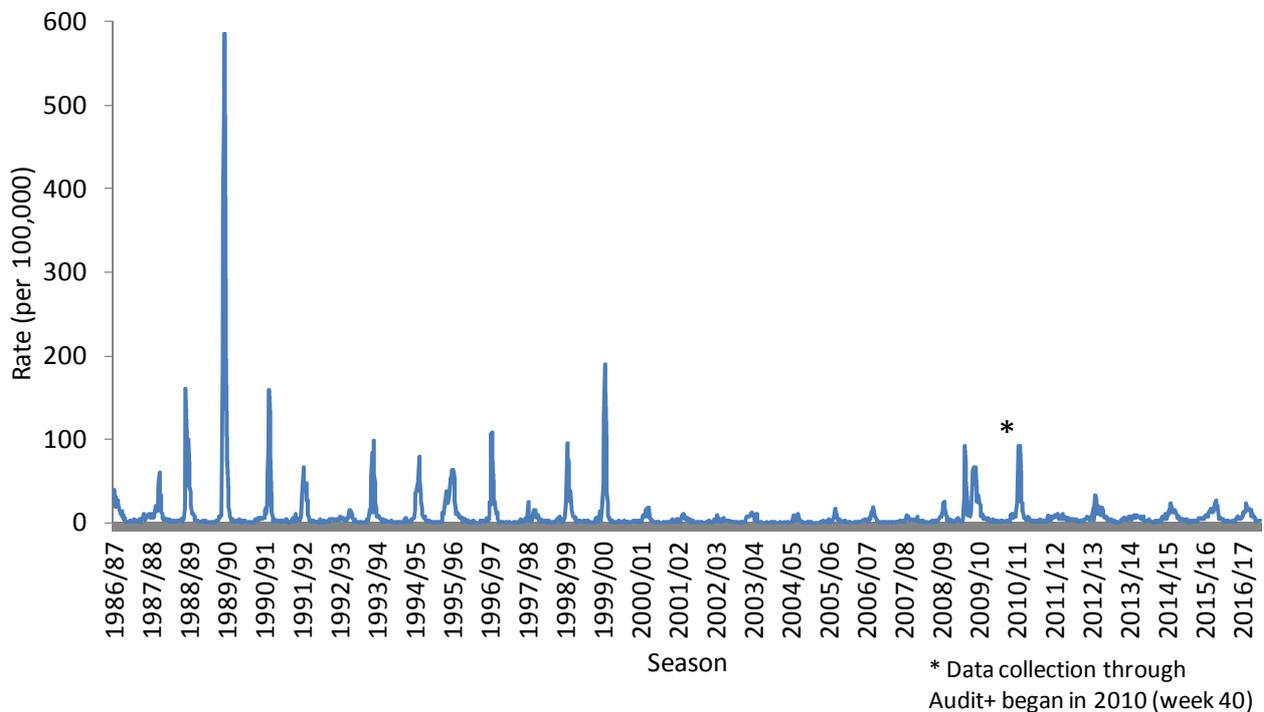
The sentinel GP consultation rate for ILI was above the threshold for low intensity seasonal activity for a total of 11 weeks in 2016/17, compared to 14 weeks in 2015/16 (Table 2.1.1). During this time four weeks were in medium intensity levels of activity, compared to seven weeks observed at medium intensity in 2015/16. The peak in consultation rate seen during 2016/17 was also lower than the peak seen in 2015/16 (Figure 2.1.1).

Table 2.1.1 Comparison of sentinel GP consultation rates from 2012/13 to 2016/17

	Influenza Season				
	2012/13	2013/14	2014/15	2015/16	2016/17
Start of season (week of year)	50	Threshold to indicate low	50	1	49
Weeks sentinel GP ILI consultation rate above baseline threshold (n)	14	level activity not exceeded	13	14	11
Weeks sentinel GP ILI consultation rate above medium activity levels (n)	Not available*	Not available*	2	7	4
Peak sentinel GP ILI consultation rate	33	8.8	23.2	25.8	22.8

*Medium intensity threshold introduced in 2014/15

Figure 2.1.2. Public Health Wales sentinel GP weekly consultation rate for influenza-like illness 1986 to 2017



The cumulative sentinel GP ILI rate for 2016/17 was similar to that seen in 2014/15, but lower than observed in 2015/16 (Figure 2.1.3). Compared to 2014/15 and 2015/16 there was a change in the age

distribution of ILI cases diagnosed in GP (Figure 2.1.4). During 2016/17, the consultation rate for ILI was highest in patients aged 15 to 24 years (352 per 100,000 for the period 2016 week 40 to 2017 week 20). This is a different pattern to 2014/15, the previous season dominated by influenza A(H3N2) (Figure 2.1.4).

During the period 2016 week 40 to 2017 week 20 (October 3rd 2016 to May 21st 2017) there were 6,994 consultations with general practices in Wales due to ILI reported to Public Health Wales through Audit+. This is based on an average weekly reporting rate from 95% of practices, therefore the true total for ILI cases diagnosed in all GPs in Wales will be higher. Only a proportion of those who are infected with influenza will consult with their GP in any given influenza season.

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 2016/17. Dominant circulating types of influenza are indicated for each season.

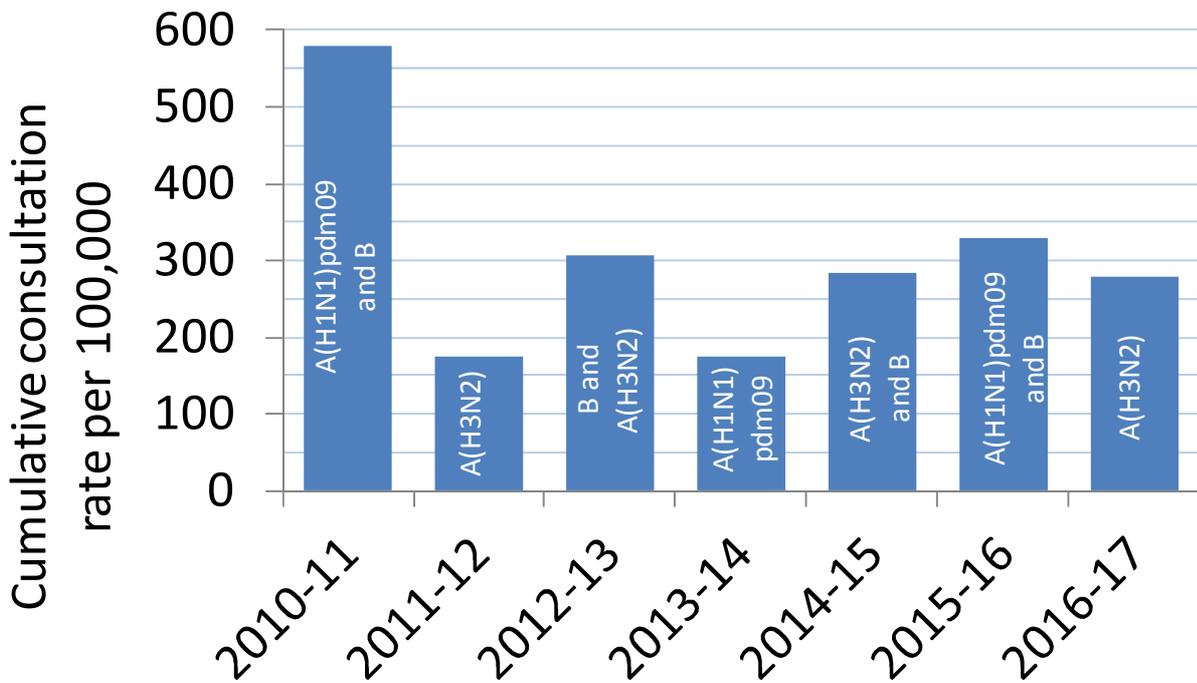
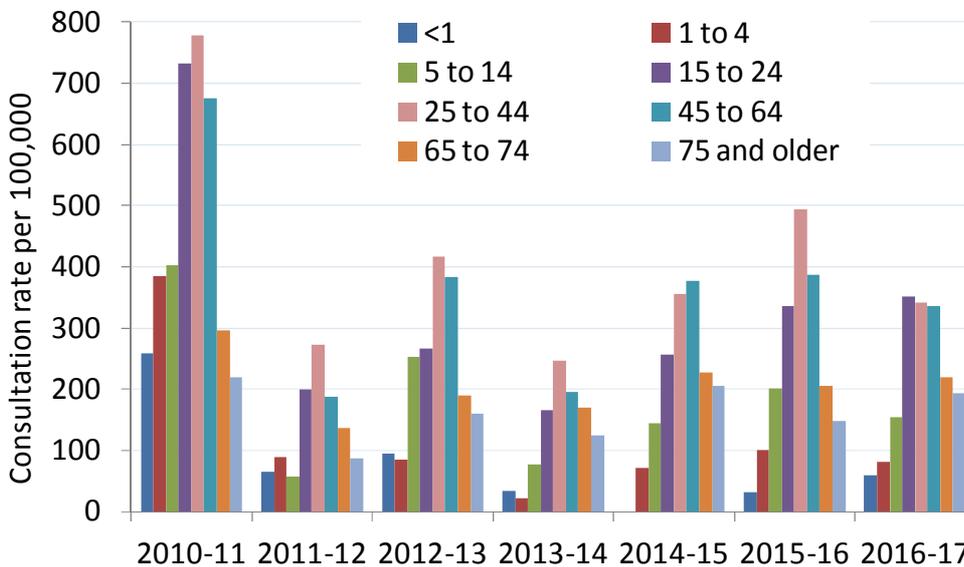


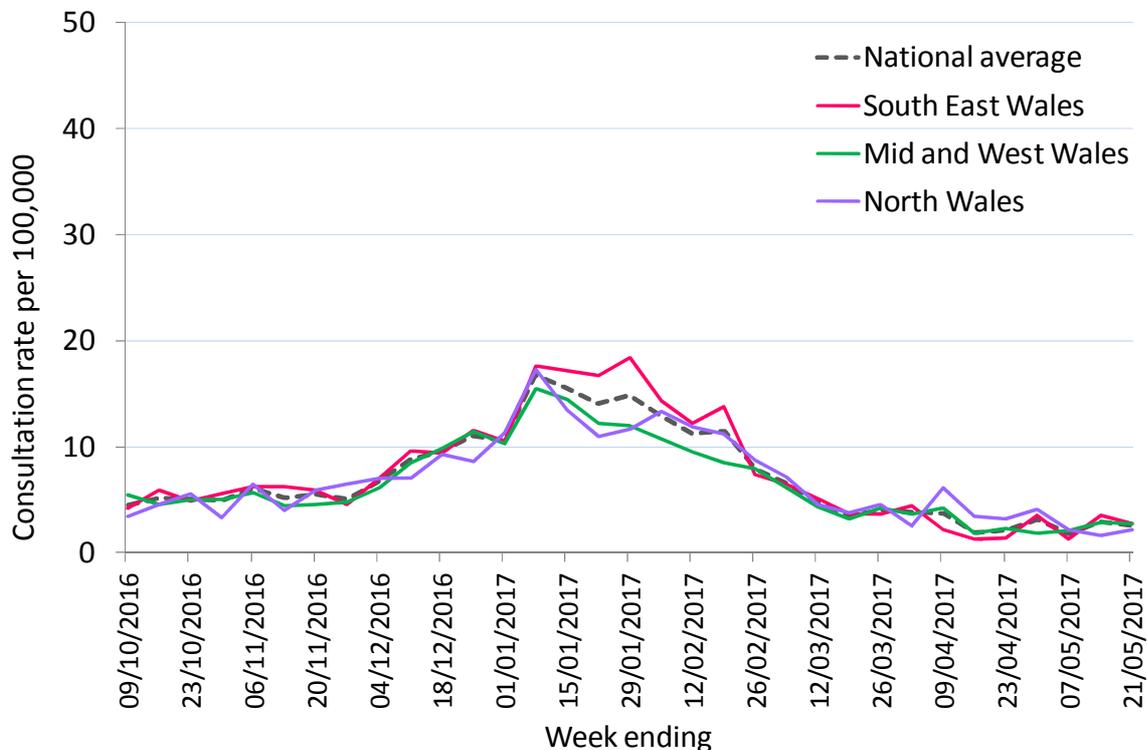
Figure 2.1.4. Age-group specific cumulative consultation rates for influenza-like illness, per season (from week 40 to week 20), in sentinel GP patients 2010/11 to 2016/17



All available data from practices providing ILI consultation data, though Audit+, between October 2016 and May 2017 were used to investigate regional differences in timing and intensity of the influenza season (Figure 2.1.5). GP ILI consultation rates followed a similar pattern in all regions

- In South East Wales (Aneurin Bevan, Cardiff and Vale and Cwm Taf University Health Board areas), the peak in ILI consultation rate was seen during week 4 (ending 29 January), at 18.4 per 100,000 practice population.
- In Mid and West Wales (Abertawe Bro Morgannwg and Hywel Dda University Health Board areas, and Powys Teaching Health Board area) the peak in ILI consultation rate was seen during week 2 (ending 15 January), at 15.4 per 100,000 practice population.
- In North Wales (Betsi Cadwaladr University Health Board area) the peak in ILI consultation rate was seen during week 1 (ending 8 March), at 17.3 per 100,000 practice population.

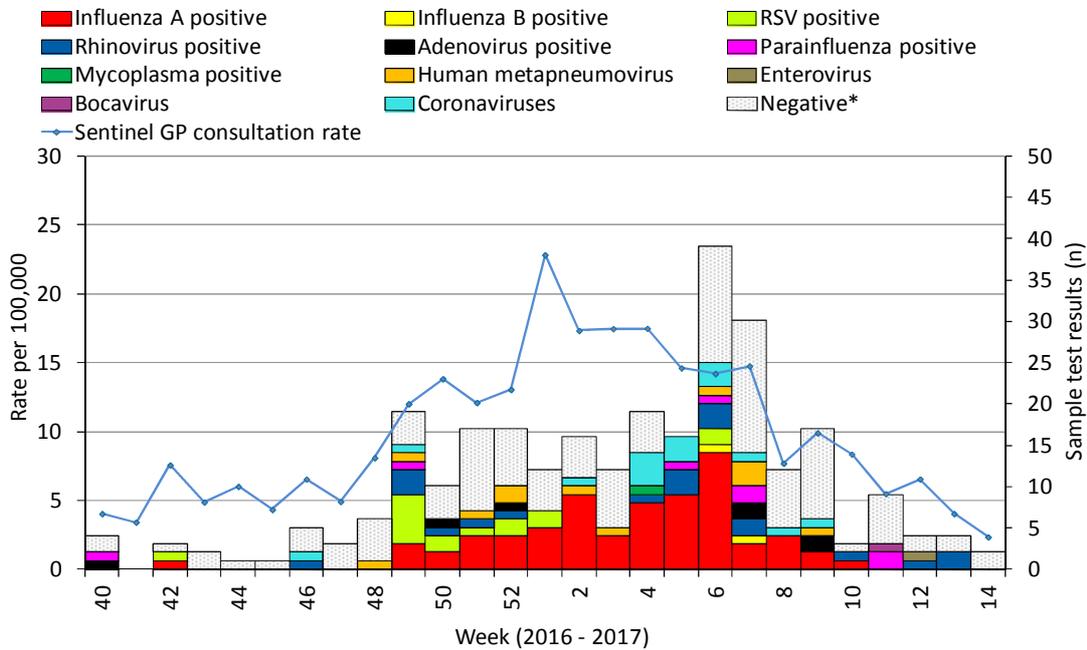
Figure 2.1.5. Weekly consultation rates for influenza-like illness in regions of Wales, data from all available practices submitted through Audit+, compared to the national average, 2016/17.



2.2 Community indicators - Virological surveillance in the community

Between 2016 week 40 and 2017 week 14 (03 October 2016 to 09 April 2017), 23 sentinel GP practices collected and submitted 196 samples from patients diagnosed with influenza-like illness (ILI), mean 8 per participating practice. An additional 66 samples were also collected from patients whom sentinel GPs diagnosed with an acute respiratory illness (ARI). Of the total number of samples submitted, 98.9% (n=259) samples were virologically tested and of these, 28.6% (n=75) tested positive for influenza (72 influenza A(H3), one influenza A(H1N1) and two influenza B). Forty-four percent (n=116) were negative for all routinely tested respiratory organisms. 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 influenza symptoms peaked in week six of 2017 (week ending 12/02/2017, 38 patient samples) (Figure 2.2.1).

Figure 2.2.1. Results from Public Health Wales GP sentinel virological surveillance for influenza and other seasonal causes of respiratory illness by Week, 2016/17. The sentinel GP ILI consultation rate per 100,000 is also included.



Influenza A was first detected in a sample submitted during 2016 week 42. Between weeks 43 and 48 of 2016, no influenza was detected in samples submitted by sentinel GPs. In week 49, influenza A(H3) was detected in three samples submitted by sentinel practices, and then detected every week from 2016 week 49 (week ending 20th December) to 2017 week 10 (week ending 12th March) (Figure 2.2.1). One sample tested positive for influenza A(H1N1), collected in week 2 of 2017. Two samples tested positive for influenza B, one in week 6 and one in week 7 of 2017.

Table 2.2.1. *Samples from sentinel GP patients with influenza-like symptoms testing positive for influenza A and influenza B between 2016 week 40 and 2017 week 14 by age group.*

Age Group	All Influenza		Negative		Samples Tested	
	n	%	n	%	n	%
Under 1	1	1.3%	0	0.0%	2	0.8%
1 to 4	2	2.7%	0	0.0%	4	1.5%
5 to 9	1	1.3%	0	0.0%	1	0.4%
10 to 14	4	5.3%	4	3.4%	15	5.8%
15 to 24	16	21.3%	23	19.8%	51	19.7%
25 to 34	10	13.3%	14	12.1%	32	12.4%
35 to 44	7	9.3%	20	17.2%	38	14.7%
45 to 64	23	30.7%	41	35.3%	84	32.4%
65 to 74	5	6.7%	11	9.5%	20	7.7%
75 and older	6	8.0%	3	2.6%	12	4.6%
Total	75	100%	116	100%	259	100%

Thirty-two percent of all symptomatic patients who visited a sentinel practice and who were tested for seasonal respiratory pathogens between 3rd October 2016 and 9th April 2017 were aged 45 to 64 years (Table 2.2.1), the median age of patients tested was 41 years. Out of the sentinel GP patients testing positive for influenza 30.7% were aged 45 to 64 years, and the median patient age was 41 years.

2.3 Hospital indicators - Virological surveillance

From 2016 week 40 to 2017 week 14 (3rd October 2016 to 9th April 2017), there were 5,421 hospital and non-sentinel GP patients presenting with symptoms of respiratory infection who had a sample collected and tested by Public Health Wales Microbiology. Of these, 93.9% (n=5,090) were from patients in hospitals, 3.7% (n=200) were collected from patients attending non-sentinel GPs, and location could not be determined for 2.4% (n=131) (Table 2.3.1).

Of the hospital patient samples 56.7% (n=2,888) were collected from patients in general inpatient and outpatient hospital wards, 28.5% (n=1,448) were collected from patients attending A/E or urgent care wards and 14.8% (n=754) were collected from patients admitted to an intensive care hospital ward. Of the patients tested in hospital, 671 were confirmed with influenza, 98% of whom had influenza A (Table 2.3.1).

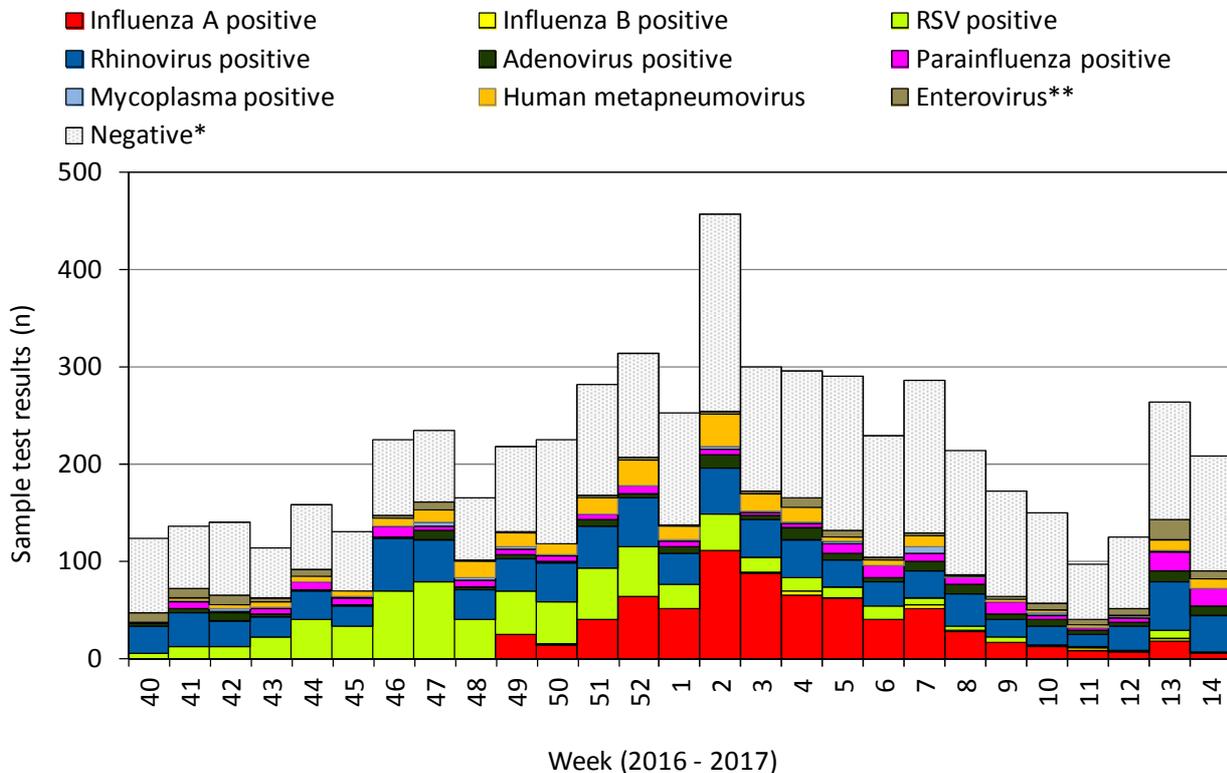
Table 2.3.1. Respiratory samples submitted and tested for influenza* and RSV in Wales in 2016/17, by sample location.

Sample Location	Influenza A		Influenza B		RSV		Negative		All screens	
	n	%	n	%	n	%	n	%	n	%
Sentinel Practice	73	9.2%	2	11.1%	16	2.4%	116	4.1%	262	4.6%
Non-sentinel Practice	42	5.3%	1	5.6%	13	1.9%	111	3.9%	200	3.5%
Total Community Samples	115	14.5%	3	16.7%	29	4.3%	227	7.9%	462	8.1%
Hospital - General	333	42.1%	9	50.0%	361	54.0%	1484	51.9%	2888	50.8%
Hospital - A&E	251	31.7%	5	27.8%	198	29.6%	631	22.1%	1448	25.5%
Hospital - ITU	73	9.2%	1	5.6%	63	9.4%	454	15.9%	754	13.3%
Total Hospital Samples	657	83.1%	15	83.3%	622	93.0%	2569	89.9%	5090	89.6%
Other / Unknown locations	19	2.4%	0	0.0%	18	2.7%	62	2.2%	131	2.3%
Total	791	100%	18	100%	669	100%	2858	100%	5683	100%

* One hospital patient tested positive for both influenza A and influenza B

Samples are routinely tested for: influenza, RSV, Adenovirus, *Mycoplasma pneumoniae*, rhinovirus, parainfluenza and human metapneumovirus. From week 29 2016 onwards, samples were also tested for enterovirus. Influenza was confirmed in 13.5% (n=733) of samples from hospital and non-sentinel GP patients. The two other most commonly detected respiratory pathogens in the 5,421 samples tested were rhinovirus (16.4%, n= 889) and RSV (12.0%, n=653). Other detected causes of respiratory infection included: human metapneumovirus (4.9% n= 266), parainfluenza (3.6%, n=194), enterovirus (2.6%, n=139), adenovirus (3.0%, n=162) and *Mycoplasma pneumoniae* (0.7%, n=38). Fifty one percent (n=2,742) were negative for all routinely tested organisms. The weekly number of hospital or non-sentinel GP patients tested for seasonal respiratory illness peaked during week 2 2017 (week ending 15th January 2017, n=425).

Figure 2.3.1. Results from respiratory tests carried out on samples from patients in hospitals and non-surveillance samples from patients in general practice in Wales by Week, 2016/17.



Sporadic numbers of influenza A(H3N2) were detected from 2016 week 42 to week 48. Weekly detections of influenza A(H3N2) were seen beginning in 2016 week 49 (week ending 11th December) (Figure 2.3.1). The proportion of samples testing positive for influenza peaked in week 3 (n=88/276, 31.9% positivity), all of these were influenza A(H3N2) with one sample positive for both influenza A(H3N2) and influenza B. The proportion of samples testing positive for influenza exceeded 10% from 2016 week 51 (week ending 25th December) to 2017 week 9 (week ending 5th March). The peak week for sample test positivity for RSV was week 47 of 2016 (week ending 27th November 2016, 78/200, 39.0%).

Of 733 samples from hospital and non-sentinel GP patients tested from 2016 week 40 to 2017 week 14, influenza A was detected in 12.2% (n=718), whilst influenza B was detected in 0.3% (n=16). One patient tested positive for both influenza A and influenza B. Of the 716 influenza A samples that were further typed more than 99% (n=714) were influenza A(H3) and less than one per-cent (0.3%, n=2) were influenza A(H1N1)pdm09.

Table 2.3.2. Patient samples from all hospital and non-sentinel GP locations testing positive for influenza and RSV by age group¹ between 2016 week 40 and 2017 week 14 by age group.

Age Group	All Influenza		RSV		Negative		Samples Tested	
	n	%	n	%	n	%	n	%
Under 1	20	2.7%	324	49.6%	211	7.7%	859	15.8%
1 to 4	27	3.7%	102	15.6%	139	5.1%	508	9.4%
5 to 9	15	2.0%	13	2.0%	76	2.8%	173	3.2%
10 to 14	19	2.6%	3	0.5%	54	2.0%	103	1.9%
15 to 24	43	5.9%	14	2.1%	182	6.6%	304	5.6%
25 to 34	31	4.2%	9	1.4%	188	6.9%	306	5.6%
35 to 44	34	4.6%	8	1.2%	155	5.7%	261	4.8%
45 to 64	153	20.9%	34	5.2%	626	22.8%	982	18.1%
65 to 74	118	16.1%	58	8.9%	459	16.7%	751	13.9%
75 and older	273	37.2%	88	13.5%	652	23.8%	1173	21.6%
Total	733	100%	653	100%	2742	100%	5420	100%

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

Table 2.3.3a. Patients testing positive for influenza by hospital location and age group, between 2016 week 40 and 2017 week 14 by age group.

Age Group	General In & Out Patient		Urgent Care & A/E Wards		ICU Wards	
	n	%	n	%	n	%
Under 1	9	2.6%	9	3.5%	1	1.4%
1 to 4	13	3.8%	13	5.1%	0	0.0%
5 to 9	6	1.8%	7	2.7%	1	1.4%
10 to 14	13	3.8%	5	2.0%	1	1.4%
15 to 24	19	5.6%	18	7.0%	2	2.7%
25 to 34	12	3.5%	9	3.5%	1	1.4%
35 to 44	9	2.6%	18	7.0%	4	5.4%
45 to 64	62	18.2%	59	23.0%	18	24.3%
65 to 74	53	15.5%	41	16.0%	20	27.0%
75 and older	145	42.5%	77	30.1%	26	35.1%
Total	341	100%	256	100%	74	100%

Table 2.3.3b. Patients testing positive for RSV by hospital locations and age group, between 2016 week 40 and 2017 week 14 by age group.

Age Group	General In & Out Patient		Urgent Care & A/E Wards		ICU Wards	
	n	%	n	%	n	%
Under 1	186	51.5%	90	45.5%	37	58.7%
1 to 4	49	13.6%	45	22.7%	4	6.3%
5 to 9	10	2.8%	3	1.5%	0	0.0%
10 to 14	2	0.6%	0	0.0%	0	0.0%
15 to 24	11	3.0%	1	0.5%	1	1.6%
25 to 34	5	1.4%	2	1.0%	1	1.6%
35 to 44	2	0.6%	1	0.5%	3	4.8%
45 to 64	17	4.7%	9	4.5%	4	6.3%
65 to 74	34	9.4%	17	8.6%	7	11.1%
75 and older	45	12.5%	30	15.2%	6	9.5%
Total	361	100%	198	100%	63	100%

Of all the symptomatic patients in hospitals and non-sentinel GP locations who were tested for seasonal respiratory pathogens between 3rd October 2016 and 9th April 2017, 21.6% were aged 75 years or older, 18.1% were aged 45 to 64 years, and 15.8% were under one year (Table 2.3.2), the median age of patients tested was 49 years.

Out of symptomatic patients in hospitals and non-sentinel GP patients testing positive for influenza, 37.2% were aged 75 years and older and 20.9% were 45 to 64 years, the median patient age was 67 years. The median age of patients testing positive for RSV was one year, 49.6% of all these patients were younger than one year of age and 15.6% were aged one to four years (Table 2.3.2). Patients who were aged 75 years and older accounted for the highest proportions of confirmed influenza cases in A/E wards, ICU wards and general hospital wards (Table 2.3.3a). Children who were aged under one year accounted for the highest proportion of confirmed cases of RSV in A/E wards ICU wards and general hospital wards (Table 2.3.3b).

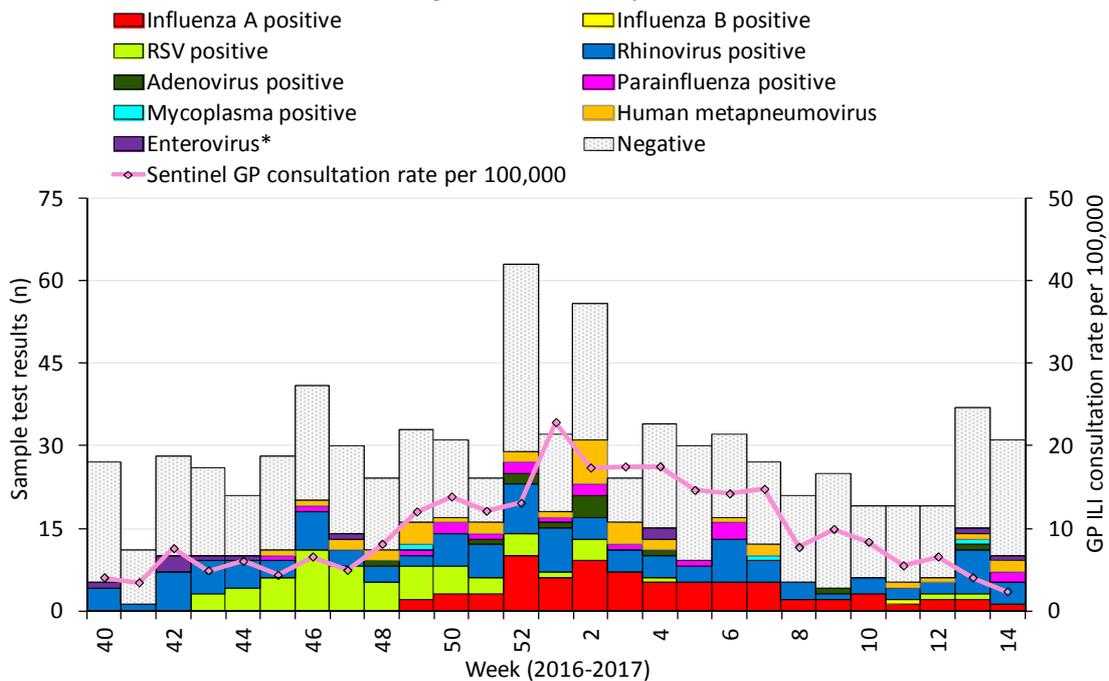
2.4 Hospital indicators - patients in intensive care units

During the period 2016 week 40 to 2017 week 14 (3rd October 2016 to 9th April 2017) there were 754 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 754 samples tested 9.8% (n=74) were positive for influenza, 8.4% (n=63) were positive for RSV and 60.2% (n=454) were negative for all organisms routinely tested for (Table 2.4.1).

Influenza A(H3N2) was first detected in patients in ICU in 2016 week 49 (week ending 11th December) and continued to be detected in patients in ICU through 2017 to week 14 (week ending 9th April) (Figure 2.4.1). All of the 73 influenza A samples that were further typed were influenza A(H3N2). There was one influenza B positive sample in 2017 week 11.

Figure 2.4.1. Results from respiratory tests carried out on samples from patients in intensive care units in Wales by Week, 2016/17.



Of all the patients in ICU who were tested for seasonal respiratory pathogens between 3rd October 2016 and 9th April 2017, 66.7% were aged 45 and older and 19.0% were under 1 year of age (Table 2.4.1). The median age of patients tested was 61 years. Out of the patients testing positive for influenza A, 35.6% were aged 75 years and older and the median patient age was 70 years. The median age of patients testing positive for RSV was 7 months (216 days), 58.7% of all these patients were younger than one year of age.

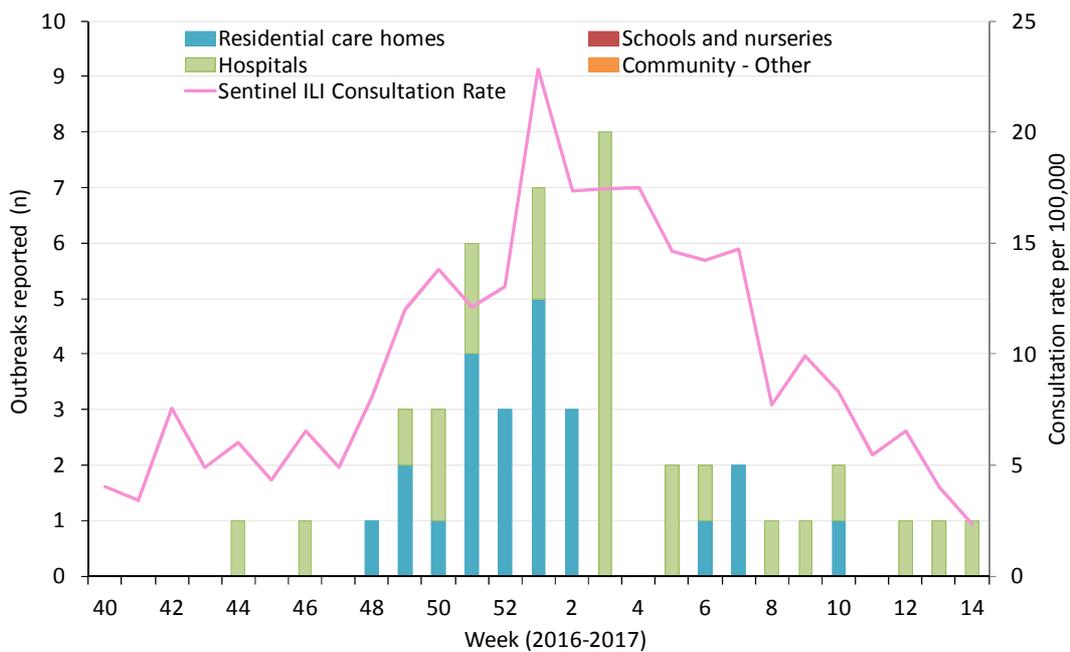
Table 2.4.1. *Samples from patients in ICU/HDU testing positive for influenza A and RSV between 2016 week 40 and 2017 week 14 by age group¹*

Age Group	Influenza A		Influenza B		RSV		Negative		Samples Tested	
	n	%	n	%	n	%	n	%	n	%
Under 1	1	1.4%	0	0.0%	37	58.7%	73	16.1%	143	19.0%
1 to 4	0	0.0%	0	0.0%	4	6.3%	5	1.1%	23	3.1%
5 to 9	1	1.4%	0	0.0%	0	0.0%	2	0.4%	8	1.1%
10 to 14	1	1.4%	0	0.0%	0	0.0%	4	0.9%	7	0.9%
15 to 24	2	2.7%	0	0.0%	1	1.6%	12	2.6%	20	2.7%
25 to 34	1	1.4%	0	0.0%	1	1.6%	19	4.2%	22	2.9%
35 to 44	4	5.5%	0	0.0%	3	4.8%	16	3.5%	28	3.7%
45 to 64	17	23.3%	1	100.0%	4	6.3%	117	25.8%	171	22.7%
65 to 74	20	27.4%	0	0.0%	7	11.1%	105	23.1%	164	21.8%
75 and older	26	35.6%	0	0.0%	6	9.5%	101	22.2%	168	22.3%
Total	73	100%	1	100%	63	100%	454	100%	754	100%

2.5 Outbreaks of influenza, ILI or acute respiratory infection

During the 2016/17 influenza season in Wales there were 49 outbreaks of acute respiratory illness (ARI) reported to Public Health Wales Health Protection Teams (Figure 2.5.1), compared to 21 reported outbreaks for the 2015/16 season. Influenza A was laboratory confirmed in 24 of the outbreaks reported this season. Twenty-six (53.1%) of the ARI outbreaks were reported from hospital wards, and 23 (46.9%) were reported from residential care homes. Thirty (61.2%) of the ARI outbreaks reported occurred in South or South East Wales (covering Cardiff and Vale University Health Board, Cwm Taf University Health Board and Aneurin Bevan University Health Board), 15 (30.6%) of the outbreaks occurred in Mid and West Wales (covering Abertawe Bro Morgannwg University Health Board, Hywel Dda University Health Board and Powys Teaching Health Board), and four (8.2%) of the outbreaks were reported from North Wales (covering Betsi Cadwaladr University Health Board).

Figure 2.5.1. Outbreaks of acute respiratory illness reported to Public Health Wales Health Protection Team during the 2016/17 season from community settings, and sentinel GP ILI consultation rate per 100,000.



2.6 Excess mortality during the influenza season

During 2016/17 weekly monitoring of seasonal excesses in mortality was carried out by Public Health England using the EuroMoMo method [4]. 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 3 and specifically in those aged 65 years and older during 2016 week 52 and 2017 week 3 [4].

3. Influenza virus characterisation, vaccine effectiveness and antivirals

3.1 Laboratory characterisation of influenza viruses

The 2016/17 flu season in the UK was dominated by influenza A(H3N2) viruses. In contrast to previous recent seasons in Wales, very few influenza B viruses were detected, accounting for less than 5% of all confirmed cases.

Genetic characterisation of influenza viruses from patient samples in the UK indicated although there was some a degree of diversity seen in influenza A(H3N2) viruses, they appeared to be similar to the virus strain contained in the 2016/17 Northern hemisphere influenza vaccines. In Wales influenza A(H3N2) viruses from 70 patient samples were characterised, all of which belonged to the genetic subclade 3C.2a. Limited diversity was noted within this subclade, all viruses characterised from south east Wales were 3C.2a1. A proportion of viruses characterised from west and north Wales had N121K and S144K mutations, but were missing N171K mutation seen in the 3C.2a1 viruses.

The A/HongKong/4801/2014 influenza A(H3N2) virus strain contained in 2016/17 Northern hemisphere influenza vaccines is also part of the genetic subclade 3C.2a.

Due to difficulties in propagating detected influenza A(H3N2), antigenic characterisation data is particularly limited this season, with only 24 viruses characterised from the UK. Although all of these viruses appeared matched to the influenza vaccine strain A(H3N2) virus, care should be taken in interpreting this information due to the extremely small sample size and the potential for bias in the results.

3.2 Effectiveness of the 2016/17 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 this report was prepared. A study conducted by the Centers for Disease Control and Prevention in the USA, using the outcome of laboratory confirmed influenza in medical outpatient visits, estimated overall adjusted vaccine effectiveness as 42% (95% CI: 35-48%) [5]. The multi-centre collaborative I-MOVE study carried out in 15 European countries and using laboratory-confirmed influenza primary care attendances as a main outcome, estimated fully adjusted vaccine effectiveness as 38% (95% CI: 21-51%) [6]. The group reported that effectiveness varied according to age-group and was 44%, 47% and 23% for 0 to 14 year olds, 15 to 64 year olds and those aged 65 years and older respectively.

3.3 Antiviral prescribing rates

The GP prescribing rate of oseltamivir (measured using data collected through Audit+ on coded prescriptions in general practice) in Wales followed a similar trend to the sentinel GP consultation rate for ILI. The prescribing rate peaked at 4.1 per 100,000 practice population during week 2 2017 (week ending 15th January, Figure/ Table 3.3.1), which was one week after the peak for ILI consultations in sentinel practices. The peak in prescribing rate during 2016/17 was higher than the 2015/16 peak prescribing rate in Wales (Table 3.3.1). During the 2016/17 season in the UK, most viruses were fully

susceptible and only small numbers of viruses were detected with reduced sensitivity to oseltamivir or zanamivir [7].

Figure 3.3.1. Prescribing rate for oseltamivir per 100,000 practice population in Wales from week 40 2015 to week 20 2017 (arrows indicate when antiviral licensing triggers were issued, in line with NICE guidance).

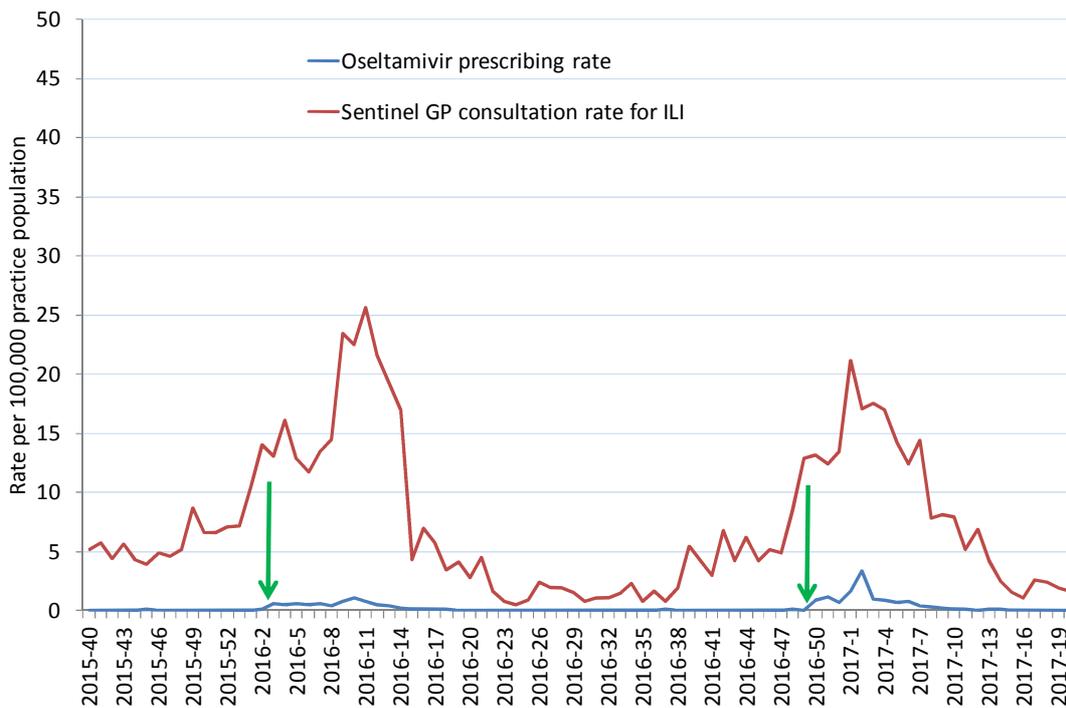


Table 3.3.1. Peak sentinel GP consultation rates for ILI per 100,000 practice population and peak all Wales prescribing rates per 100,000 for influenza seasons from 2010/11 to 2016/17

Influenza Season	Peak sentinel GP ILI consultation rate ¹	Peak all Wales GP oseltamivir prescribing rate ¹
2010/11	92.2	12.4
2011/12	10.4	1.0
2012/13	25.7	0.8
2013/14	8.5	0.2
2014/15	23.2	3.0
2015/16	25.8	1.1
2016/17	21.1	3.4

¹Rates are per 100,000 practice population

4. Influenza immunisation in Wales 2016/17

4.1 Data collection

4.1.1 Primary Care data

Data on influenza immunisation for the 2016/17 campaign were collected directly from GP IT systems using the Audit+ Data Quality System. Audit+ interrogates general practice 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 general practices. Data were collected on immunisations given and recorded on general practice systems between 1st September 2016 and 18th April 2017 (this report is mainly based on data submitted by 18th April 2017).

Data were received on a weekly basis throughout 2016/17 from general practices in Wales. If data from individual general practices 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 general practice was identified and used. This report is based on data submitted from 439 (99.8%) out of 440 practices automatically through Audit+. Data could not be collected from the remaining practice due to data quality issues.

Data were collected on immunisations given to those aged 65 years and older (as at 31 March 2017), 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. Immunisation uptake figures for pregnant women calculated from general practice data represent the proportion of women whose general practice records contained Read codes associated with pregnancy at any point during September 2016 to January 2017 who had received an influenza vaccine since 1 September 2016. Immunisation uptake data for patients with morbid obesity are included in the total measure for patients aged six months to 64 years for the first time this season. All data from general practices were extracted through Audit+ using searches based on the Read codes defined in the [PRIMIS Seasonal Influenza Vaccine Uptake Reporting Specification for 2016/17](#) [8].

4.1.2 Point of delivery survey data of coverage in pregnant women

During January 2017 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. In one health board the survey was conducted later in 2017 [9]. During the five day period information was collected from 427 women giving birth across Wales.

4.1.3 Reception class, year 1, 2 and 3 schoolchildren (aged four to seven years) immunisation data, and children aged 3 in nursery schools in Cwm Taf*

Data on uptake of LAIV in schoolchildren in reception class, year 1, 2 and 3 age groups (aged four to seven years as at 31 August 2016) were manually submitted by health board Immunisation Coordinators on a fortnightly basis throughout the campaign. Uptake figures represent the proportion

of children that received the LAIV at a school immunisation session. Data on uptake of LAIV in 3 year old children in nursery school classes in Cwm Taf University Health Board were also manually submitted by health board Immunisation Coordinators 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 2016 to March 2017 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 uptake figures presented in this report for staff with direct patient contact are calculated by aggregating data for staff-groups which would normally be assumed to 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 April 2017. 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 enquired about 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, which was 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

Data relating to immunisation uptake in patients aged 65 years and older, those in clinical risk groups and those recorded as being carers were submitted by 100% of general practices in Wales (Appendix Table A1).

Uptake in those aged 65 years and over was 66.7%, an increase of 0.1% from 66.6% in the 2015/16 season (Figure 4.2.1). This is 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 20th November 2016 (Figure 4.2.2). Uptake varied by University Health Board (UHB) from 63.4% (Hywel Dda UHB) to 69.0% (Cardiff and Vale UHB), (Table 4.2.1, Figures 4.2.3 and 4.2.5) and ranged by Local Authority (LA) area from 59.4% (Ceredigion) to 72.2% (Wrexham) (Figure 4.2.4, Appendix Table A1). No health board or LA area achieved the 75% target.

Uptake in those aged six months to 64 years and in a clinical risk group was 46.9%. This is the same uptake as reported in this group during the 2015/16 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 25th December 2016 (Figure 4.2.2). Uptake ranged by health board from 42.3% (Hywel Dda UHB) to 49.7% (Aneurin Bevan UHB), (Table 4.2.1, Figures 4.2.3 and 4.2.6) and by LA area from 40.8% (Ceredigion) to 53.5% (Monmouthshire) (Figure 4.2.4, Appendix Table A1). The proportion of all people aged six months to 64 years recorded in one or more clinical risk categories was 14.4% (an increase from 14.3% recorded in 2015/16). Of those aged six months to 64 years in clinical risk groups, 10.1% were recorded as having declined immunisation in general practice databases, compared to 11.4% in the 2015/16 season. For patients aged 65 years or older, 13.4% were recorded as having declined immunisation, compared to 15.4% in the 2015/16 season.

During the 2016/17 influenza season, community pharmacies across Wales provided 26,889 influenza vaccinations through the NHS community pharmacy influenza service, an increase of 36% on 2015/16 (19,786 vaccinations). All Health Boards showed increases in community pharmacy vaccination activity locally, ranging from 9% in Hywel Dda to 80% in Betsi Cadwaldr health board areas. The number of community pharmacies providing the NHS flu vaccination service during 2016/17 was 428 (total number of community pharmacies in Wales is 716). This represents an increase of 30% on 2015/16 (328). Further analysis is needed to understand the factors contributing to increased uptake of the NHS community pharmacy influenza service. The number of influenza vaccinations given through the NHS community pharmacy influenza service in Wales during 2016/17 represents an estimated 4% of vaccinations given to adults aged 65 and over or in a clinical risk group .

Figure 4.2.1. 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 – 2016/17.

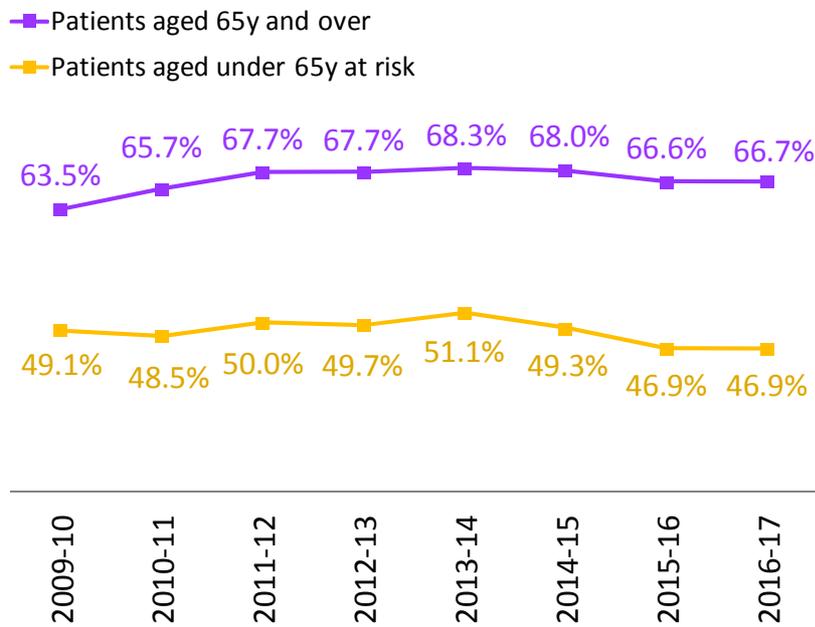


Figure 4.2.2. Uptake of influenza vaccine in patients aged 65 years and over and in those aged six months to 64 years in clinical risk groups, Wales, 2016/17.

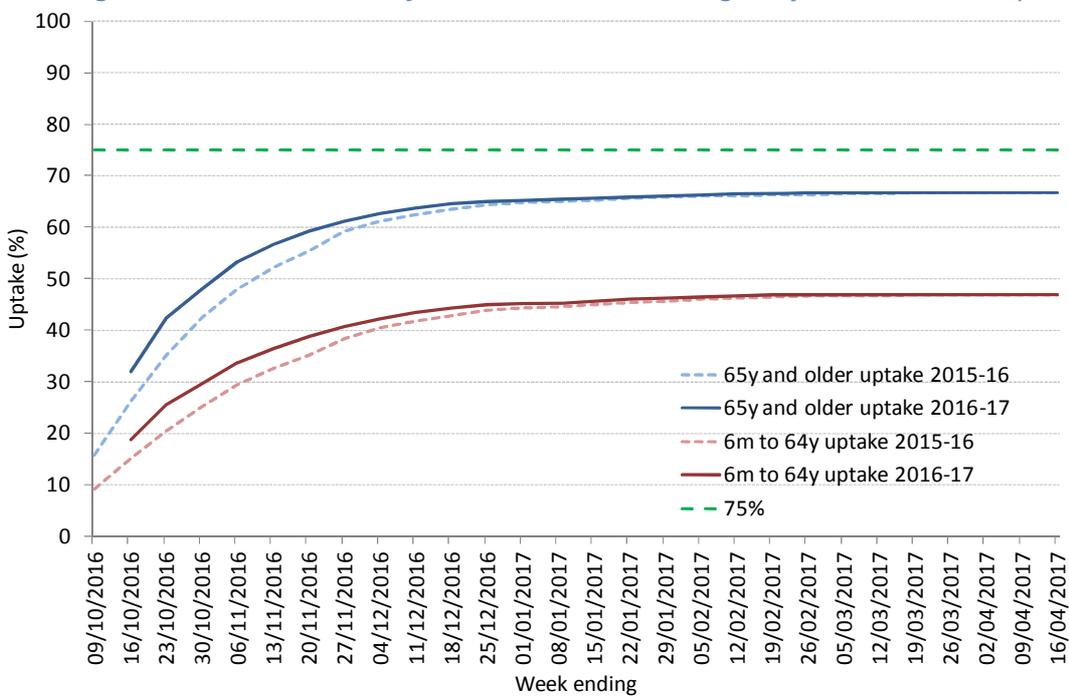


Table 4.2.1. Trends in uptake of influenza immunisation in health boards, Wales, 2013/14 - 2016/17.

Health Board	Uptake in patients aged 65y and older				Uptake in patients younger than 65y at risk			
	2013/14	2014/15	2015/16	2016/17	2013/14	2014/15	2015/16	2016/17
Abertawe Bro Morgannwg	65.6	65.0	64.6	65.0	45.3	44.0	43.4	43.7
Aneurin Bevan	70.4	70.0	67.7	68.1	55.3	52.9	49.4	49.7
Betsi Cadwaladr	70.7	70.1	68.7	68.7	53.5	51.4	49.3	49.3
Cardiff and Vale	69.7	70.0	68.9	69.0	52.7	50.4	48.3	48.3
Cwm Taf	66.3	67.5	65.0	64.9	51.4	49.8	45.9	45.2
Hywel Dda	65.5	64.9	63.9	63.4	47.5	46.2	43.2	42.3
Powys Teaching	67.0	66.5	64.3	63.9	49.5	47.8	44.2	46.0
Wales total	68.3	68.0	66.6	66.7	51.1	49.3	46.9	46.9

Table 4.2.2. Trends in general practices submitting influenza immunisation uptake data in health boards, Wales, 2013/14 - 2016/17.

Health Board	Practices submitting data (%)			
	2013/14	2014/15	2015/16	2016/17
Abertawe Bro Morgannwg	97.4	100.0	100.0	100.0
Aneurin Bevan	91.0	100.0	100.0	100.0
Betsi Cadwaladr	91.4	100.0	99.1	100.0
Cardiff and Vale	98.5	100.0	100.0	100.0
Cwm Taf	100.0	100.0	100.0	100.0
Hywel Dda	98.2	100.0	100.0	100.0
Powys Teaching	94.1	100.0	100.0	100.0
Wales total	95.1	100.0	99.8	100.0

Figure 4.2.3. Uptake of influenza immunisation in general practices during 2016/17, by health board, in: (a) patients aged 65 years and over and (b) patients aged six months to 64 years in clinical risk groups.

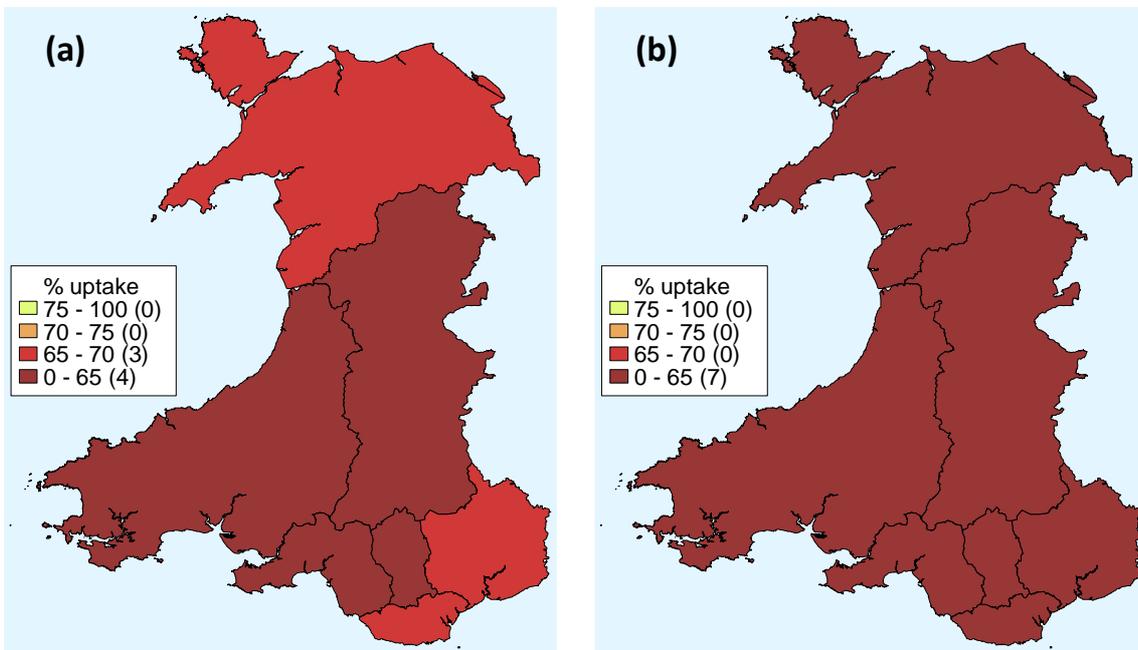


Figure 4.2.4. Uptake of influenza immunisation in general practices during 2016/17, by Local Authority of practice location, in: (a) patients aged 65 years and over and (b) patients aged six months to 64 years in clinical risk groups.

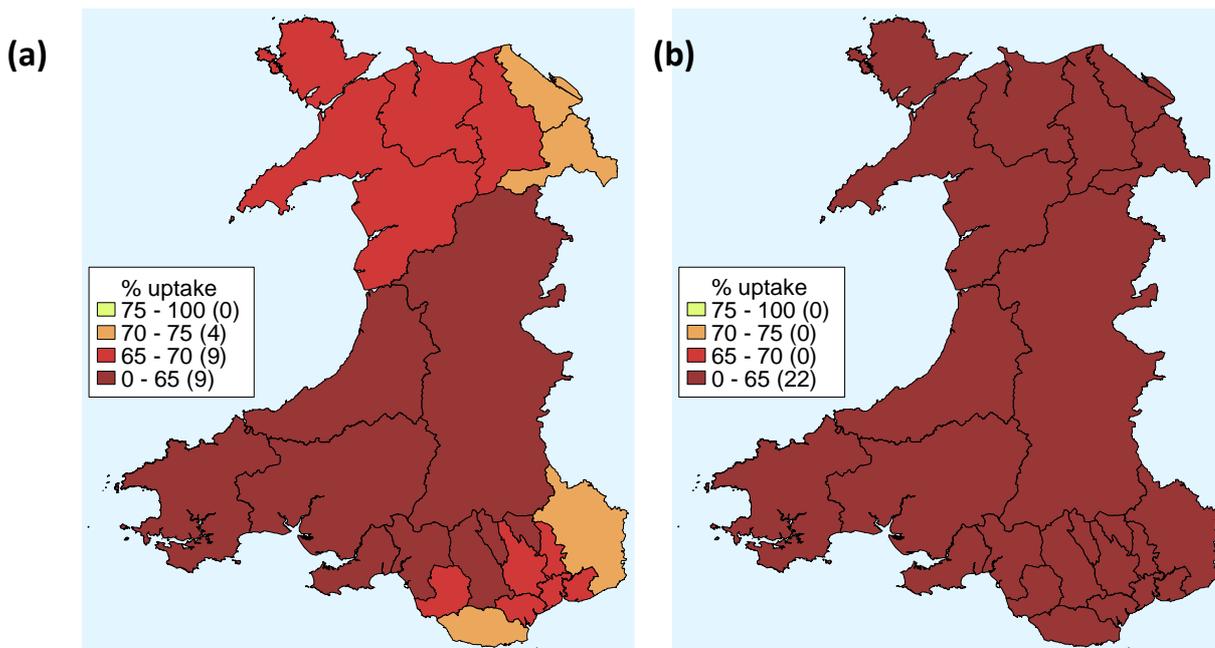


Figure 4.2.5. Uptake of influenza immunisation in health boards in Wales in patients aged 65 years and over, 2013/14 – 2016/17.

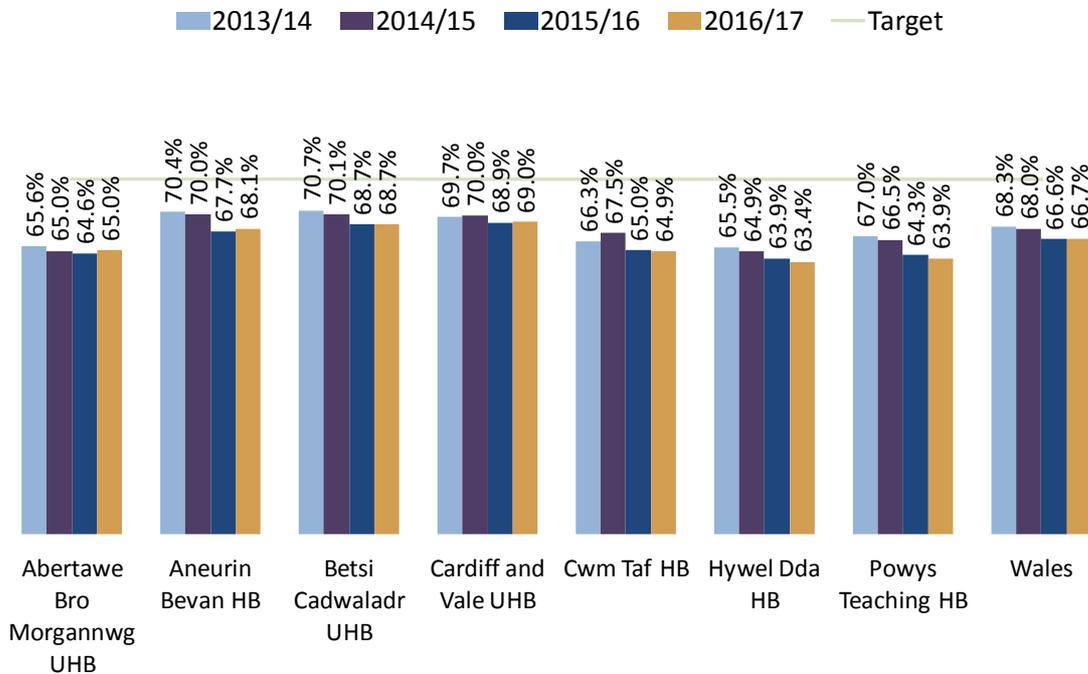
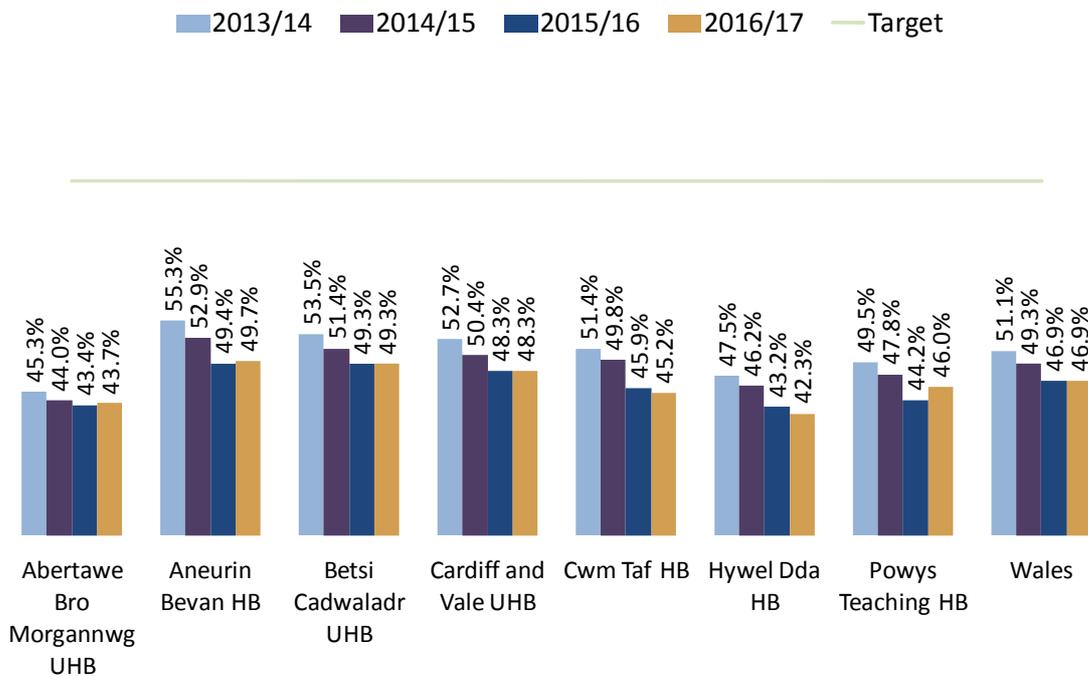


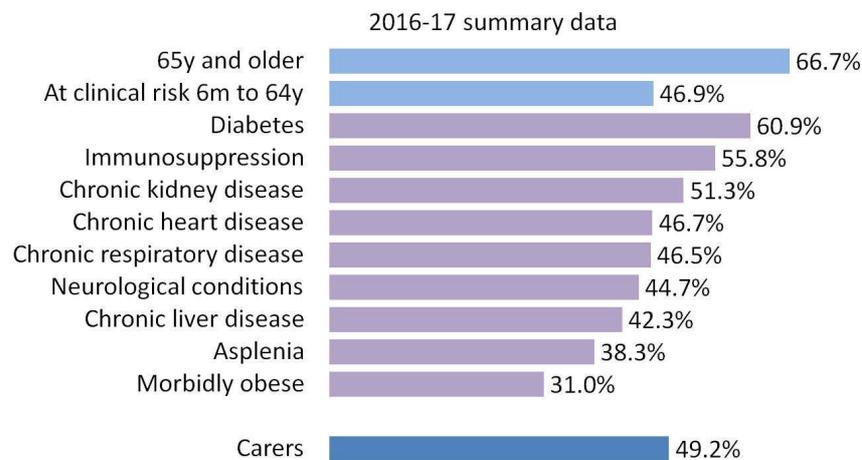
Figure 4.2.6. Uptake of influenza immunisation in health boards in Wales in patients aged six months to 64 years in clinical risk groups, 2013/14 – 2016/17.



4.2.2 Immunisation uptake broken down by risk group

Uptake in those aged six months to 64 years and in a clinical risk group was 46.9%. Many people will have more than one clinical risk which makes them eligible for influenza vaccination, for example a patient may suffer from both diabetes and chronic heart disease. When viewing influenza vaccination uptake broken down by clinical risk group, it is important to keep in mind that the same patient may be present in a number of different uptake figures for different risk groups. However, patients will only be counted once in the overall total uptake figure of 46.9% for those aged six months to 64 years in a clinical risk group irrespective of how many clinical risk conditions they suffer from.

Figure 4.2.7. Summary of influenza uptake rates in patients aged 65 years and over and six months to 64 years at risk, by individual risk group, Wales, 2016/17.



- Chronic heart disease was recorded in 2.5% of patients aged six months to 64 years, of whom 46.7% were immunised against influenza (Figure 4.2.7, Appendix Table A2). Uptake by health board ranged from 42.6% (Hywel Dda UHB) to 50.3% (Betsi Cadwaladr UHB).
- Chronic respiratory disease was recorded in 7.4% of patients aged six months to 64 years, of whom 46.5% were immunised against influenza (Figure 4.2.7, Appendix Table A2), ranging by health board from 40.8% (Hywel Dda UHB) to 49.7% (Aneurin Bevan UHB).
- Chronic kidney disease was recorded in 0.6% of patients aged six months to 64 years, of whom 51.3% were immunised against influenza (Figure 4.2.7, Appendix Table A2), ranging by health board from 47.3% (Cwm Taf UHB) to 55.1% (Aneurin Bevan UHB).
- Diabetes was recorded in 3.3% of patients aged six months to 64 years, of whom 60.9% were immunised against influenza (Figure 4.2.7, Appendix Table A2), ranging by health board from 57.3% (Hywel Dda UHB) to 65.1% (Cardiff and Vale UHB).
- Immunosuppression due to disease or treatment was recorded in 0.9% of patients aged six months to 64 years, of whom 55.8% were immunised against influenza (Figure 4.2.7, Appendix Table A2), ranging by health board from 47.4% (Abertawe Bro Morgannwg UHB) to 60.3% (Betsi Cadwaladr UHB).
- Chronic liver disease was recorded in 0.3% of patients aged six months to 64 years, of whom 42.3% were immunised against influenza (Figure 4.2.7, Appendix Table A2), ranging by health board from 35.7% (Cwm Taf UHB) to 47.2% (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 44.7% were immunised against influenza (Figure 4.2.7, Appendix Table A2), ranging by health board from 42.0% (Hywel Dda UHB) to 47.9% (Betsi Cadwaladr UHB).
- Morbidly obese was recorded in 2.9% of patients aged six months to 64 years, of whom 31.0% were immunised against influenza (Figure 4.2.7, Appendix Table A2). Uptake ranged by health board from 27.3% (Cwm Taf UHB) to 33.6% (Betsi Cadwaladr UHB).
- There were 10,384 patients aged six months to 64 years who were recorded as being asplenic (or who had dysfunctional spleens) (0.4%), of whom 38.3% were immunised (Figure 4.2.7, Appendix Table A2), ranging by health board from 35.4% (Abertawe Bro Morgannwg UHB) to 41.8% (Betsi Cadwaladr UHB).
- In total, there were 28,170 people aged six months to 64 years recorded as being a carer (including carers who are also in a clinical risk group), of whom 49.2% 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 health board from 44.5% (Hywel Dda UHB) to 52.8% (Cwm Taf UHB).

4.2.3 Uptake in pregnant women

Coverage of influenza vaccination in pregnant women is measured by Public Health Wales 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 general practice data systems can be problematic and may result 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.

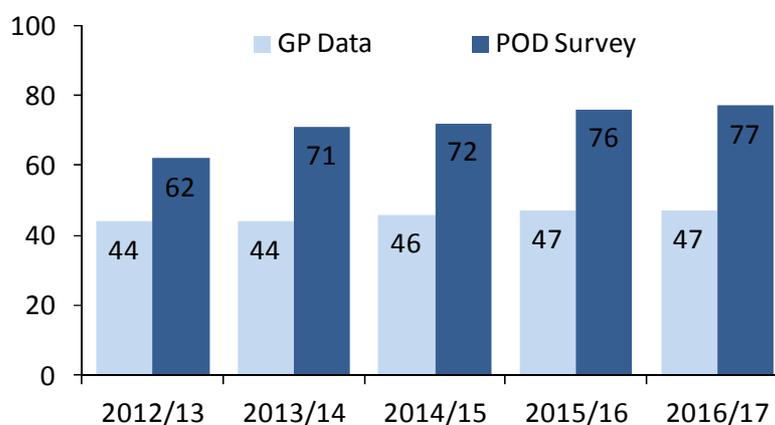
From September 2016 to January 2017, 28,404 women were coded in general practices with Read codes associated with pregnancy. Out of these women, 3,392 (11.9%) had an existing condition within the risk groups defined by the CMO letter, the remainder (25,012) did not have another condition resulting in increased risk from influenza (Appendix Table A3). Uptake of influenza vaccination in all pregnant women, measured using GP data was 47.2% and ranged by health board from 42.0% (Hywel Dda UHB) to 51.4% (Cardiff and Vale UHB). Uptake in pregnant women with another existing risk condition was 58.3% and ranged by health board from 53.7% (Hywel Dda UHB) to 63.3% (Cardiff and Vale UHB). Uptake in pregnant women without another existing condition placing them at increased risk from influenza was 45.7%, and ranged by health board from 40.4% (Hywel Dda UHB) to 49.8% (Cardiff and Vale UHB).

Coverage of influenza vaccination in pregnant women, at the point of delivery, was ascertained through a survey which used information from 423 women giving birth during a five day period in January and May 2017 [9]. Data were submitted by all health boards in Wales. Uptake of influenza immunisation recalled in this group was 76.8%, an increase compared to 75.6% last year and above the 75% vaccination target set by Welsh Government. The survey also found that 94.1% of the women surveyed could recall being offered influenza immunisation, a decrease of 1.5% from 95.6% last year (Table 4.2.3 and Figure 4.2.8). There was a higher proportion of missing data this year (4.0%) compared to last year (0%) (Table 4.2.3). The estimates using GP data are uniformly lower than those estimated using the survey at the point of delivery (Figure 4.2.8). The survey ascertained coverage at the point at which pregnant women delivered, in January or May 2017, by which time they should all have been offered influenza vaccine. Data provided by general practices 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 and subsequent update of records with delivery codes is unknown; and late 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 set in place, 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.

Table 4.2.3. Number of women offered influenza vaccine during pregnancy (Source: Uptake of pertussis and influenza vaccination in pregnant women in Wales 2016/17).

Women offered influenza vaccination while pregnant		
	n	%
Yes	398	94.1
No	8	1.9
Not known/missing	17	4.0
Total	423	100

Figure 4.2.8. Uptake of influenza vaccination in pregnant women (%), by data source, Wales, 2012/13-2016/17



4.2.4 Uptake in children

Of a total of 70,593 children aged two and three years old as at 31 August 2016, 31,956 (45.3%) were immunised against influenza in general practice. Uptake varied by health board, ranging from 38.3% (Hywel Dda UHB) to 49.8% (Betsi Cadwaladr UHB). Uptake in two year olds (45.4%) was comparable to uptake in three year olds (45.1%) (Table 4.2.4).

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 68.6% (Table 4.2.5).

Table 4.2.4. Uptake of influenza immunisation in general practice in children aged two and three years by health board*, Wales, 2016/17

Health Board	Children aged 2 years			Children aged 3 years		
	Immunised (n)	Denominator (n)	Uptake (%)	Immunised (n)	Denominator (n)	Uptake (%)
Abertawe Bro Morgannwg UHB	2676	5779	46.3	2499	6002	41.6
Aneurin Bevan UHB	3116	6846	45.5	3212	7138	45.0
Betsi Cadwaladr UHB	3646	7452	48.9	3943	7805	50.5
Cardiff and Vale UHB	2720	5988	45.4	2762	6046	45.7
Cwm Taf UHB	1396	3497	39.9	1680	3552	47.3
Hywel Dda UHB	1537	3860	39.8	1455	3946	36.9
Powys Teaching HB	693	1349	51.4	621	1333	46.6
Total	15,784	34,771	45.4	16,172	35,822	45.1

* Children aged 3 years from Cwm Taf UHB were offered influenza immunisation in nurseries attached to primary schools. Data presented in Table 4.2.4 are provided by general practices and it is likely information for some children immunised in nursery sessions in Cwm Taf was not entered in to GP records. As a result, uptake presented here for 3 year olds in Cwm Taf is likely to underestimate true uptake (see Table 4.2.5 for further information).

Table 4.2.5. Uptake of influenza immunisation in children aged three years in nursery classes in Cwm Taf Health Board, 2016/17

Health Board	Schools targeted (n)	Children aged 3 years		
		Immunised (n)	Denominator (n)	Uptake (%)
Cwm Taf UHB	131	2401	3501	68.6%

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

LAIV was offered in 1,356 schools in Wales to children in reception class, year 1, year 2 and year 3. Of the 142,777 eligible children who were aged four, five, six or seven years on 31 August 2016, 66.9% were immunised against influenza. This is an increase from the 2015/16 uptake of 63.4% in eligible children in the same age groups immunised in schools. Uptake ranged by health board from 56.8% (Cardiff and Vale UHB) to 74.1% (Cwm Taf UHB)(Table 4.2.7).

Uptake in school reception classes (children aged four to five years of age) increased to 67.7% (23,904/35,324) from 65.6% uptake in the same age group last year. Uptake varied by health board, ranging from 58.2% (Cardiff and Vale UHB) to 74.6% (Cwm Taf UHB).

Uptake in School Year 1 (children aged five to six years of age) increased to 67.7% (24,651/36,429) from 63.0% uptake in the same age group last year. Uptake varied by health board, ranging from 56.9% (Cardiff and Vale UHB) to 75.6% (Cwm Taf UHB).

Uptake in School Year 2 (children aged six to seven years of age) increased to 66.4% (23,776/35,814) from 63.7% in the same age group last year. Uptake varied by health board, ranging from 56.6% (Cardiff and Vale UHB) to 74.1% (Cwm Taf UHB).

Uptake in School Year 3 (children aged seven to eight years of age) was 65.7%. Uptake varied by health board, ranging from 55.4% (Cardiff and Vale UHB) to 73.3% (Abertawe Bro Morgannwg UHB) (Table 4.2.6).

Table 4.2.6. Uptake of influenza immunisation in school children aged four, five, six and seven years by health board, Wales, 2016/17

Health Board	Schools targeted (n)	School Children aged:			
		4 years Uptake (%)	5 years Uptake (%)	6 years (%)	7 years Uptake (%)
Abertawe Bro Morgannwg	192	72.4%	72.9%	71.5%	73.3%
Aneurin Bevan	199	67.6%	68.1%	67.9%	65.1%
Betsi Cadwaladr	382	67.3%	67.4%	64.1%	63.5%
Cardiff and Vale	151	58.2%	56.9%	56.6%	55.4%
Cwm Taf	131	74.6%	75.6%	74.1%	72.3%
Hywel Dda	219	67.9%	68.0%	68.5%	68.4%
Powys	82	69.9%	67.9%	65.1%	67.9%
Wales	1356	67.7%	67.7%	66.4%	65.7%

Table 4.2.7. Uptake of influenza immunisation in school children aged four to seven years by health board, Wales, 2016/17

Health Board	Schools targeted (n)	All children aged 4, 5, 6 & 7 years		
		Immunised (n)	Denominator (n)	Uptake (%)
Abertawe Bro Morgannwg	192	17107	23583	72.5%
Aneurin Bevan	199	18328	27281	67.2%
Betsi Cadwaladr	382	20644	31482	65.6%
Cardiff and Vale	151	13412	23619	56.8%
Cwm Taf	131	11052	14905	74.1%
Hywel Dda	219	11342	16633	68.2%
Powys	82	3568	5274	67.7%
Wales	1356	95453	142777	66.9%

4.2.5 Estimated numbers of individuals immunised in Wales in 2016/17

All practices in Wales provided immunisation uptake data during 2016/17 and the total number of individuals recorded (with Read codes) as immunised against influenza, as at 18th April 2017, was 761,838. This represents 24% of the estimated population of Wales.

This includes patients aged 65 years and over (431,791) and those aged six months to 64 years at clinical risk (174,997); also, pregnant women (11,432), children aged two and three years (31,956) and carers (13,850).

The remaining 97,812 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 (these individuals were most likely regarded as at risk by GPs based on clinical judgement).
- 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 Read codes.

The estimated total of 761,838 individuals immunised in 2016/17 is an increase on the total number of individuals immunised during the 2015/16 influenza immunisation campaign, which was estimated at 730,246 individuals [9]. These estimates are based on data submitted 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 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 that could be expected to have direct patient contact (combined: additional Professional Scientific and Technical, Additional Clinical Services, Allied Health Professionals, Medical and Dental, Nursing and Midwifery Registered staff groups) was 51.5% (Table 4.2.8). Uptake ranged by health board from 33.1% (Welsh Ambulance Service NHS Trust) to 66.8% (Velindre NHS Trust). Uptake in staff groups ranged from 36.1% (Estates and Ancillary) to 58.6% (Allied Health Professionals, Table 4.2.9).

There were 84,983 NHS health board or trust staff reported under the care of NHS Occupational Health departments in Wales and eligible for influenza vaccination, of whom 41,837 (49.2%) were immunised against influenza during 2016/17, an increase of 3.2 from 46.0% recorded in the 2015/16 season and a continuation of a seven year upward trend from 11.6% in 2009/10. Uptake ranged by health board from 26.9% (Welsh Ambulance Service NHS Trust) to 72.5% (Velindre NHS Trust). Six health boards or NHS Trusts showed an increase in uptake compared to the previous season (Figure 4.2.9).

In five health boards (Abertawe Bro Morgannwg UHB, Aneurin Bevan UHB, Betsi Cadwaladr UHB, Cardiff and Vale UHB and Powys Teaching HB) and in one NHS Trusts (Velindre NHS Trust), uptake of

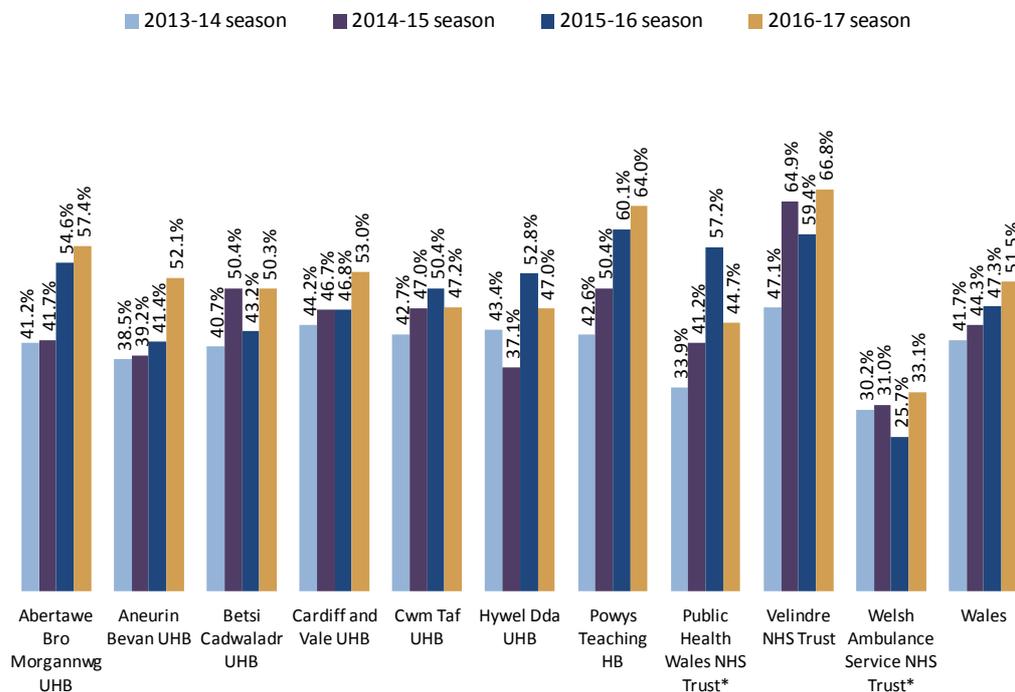
influenza vaccination in staff with direct patient contact exceeded the Welsh Government target of 50% (Table 4.2.8).

Table 4.2.8. Uptake of influenza immunisation in NHS staff in Wales, 2016/17.

Health Board	Total Staff			Staff with direct patient contact*		
	Immunised (n)	Denominator (n)	Uptake (%)	Immunised (n)	Denominator (n)	Uptake (%)
Abertawe Bro Morgannwg UHB	8676	15908	54.5	6383	11123	57.4
Aneurin Bevan UHB	6361	12675	50.2	4512	8657	52.1
Betsi Cadwaladr UHB	8189	16534	49.5	5883	11695	50.3
Cardiff and Vale UHB	7343	14645	50.1	5565	10498	53.0
Cwm Taf UHB	3626	7952	45.6	2494	5286	47.2
Hywel Dda UHB	4307	9902	43.5	3303	7033	47.0
Powys Teaching HB	1018	1758	57.9	730	1141	64.0
Public Health Wales NHS Trust	936	1725	54.3	160	358	44.7
Velindre NHS Trust	534	737	72.5	302	452	66.8
Welsh Ambulance Service NHS Trust	847	3147	26.9	682	2061	33.1
Wales	41837	84983	49.2	30014	58304	51.5

* 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, 2013/14 - 2016/17.



* For Public Health Wales and Welsh Ambulance Service NHS trusts, 2013/14 and 2014/15 figures represent all staff

Table 4.2.9. Uptake of influenza immunisation in NHS staff groups, Wales, 2016/17.

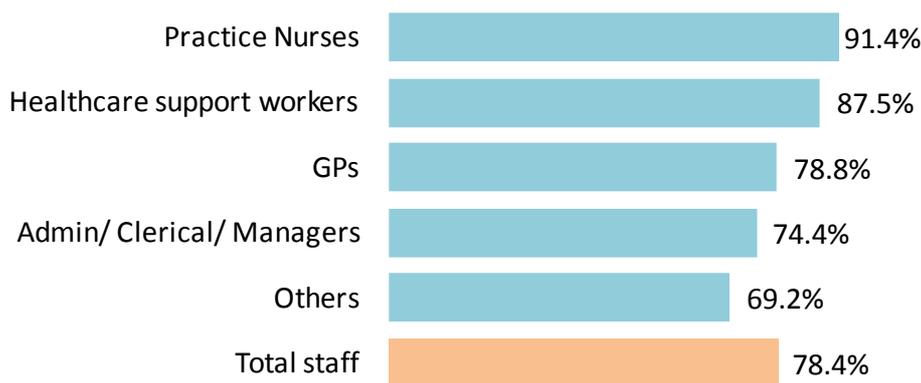
ESR staff group	Immunised (n)	Staff	
		Denominator (n)	Uptake (%)
Additional Clinical Services	7961	15806	50.4
Additional Prof Scientific and Technical	1527	3014	50.7
Administrative and Clerical	7060	13956	50.6
Allied Health Professionals	2910	4966	58.6
Estates and Ancillary	3089	8554	36.1
Healthcare Scientists	733	1716	42.7
Medical and Dental	3922	6914	56.7
Nursing & Midwifery Registered	12852	25185	51.0

4.2.7 Uptake in general practice staff

In April 2017, Public Health Wales carried out an internet-based survey of influenza immunisation uptake in general practice staff in Wales. The response rate for this survey was 10.5% (n=46) out of 440 practices in Wales, varying by health board from 0.0% (Powys Teaching health board) to 13.7% (Abertawe Bro Morgannwg University health board).

Uptake of influenza immunisation in general practice ranged by staff group from 69.2% (others) to 91.4% (practice nurses) (Figure 4.2.10). Overall uptake in staff from responding practices was 78.4%. In responding practices, 15.7% of staff had declined influenza immunisation. Due to the low response rate in this survey, results must be interpreted with caution and may not be representative of general practices across Wales.

Figure 4.2.10. Uptake of influenza immunisation in general practice staff - 2016/17 (based on information from 10.5% of general practices in Wales).



5. Conclusions

The 2016/17 season was earlier than the 2015/16 influenza seasons and slightly shorter in duration. Consultation rates for GP diagnosed ILI crossed the baseline MEM threshold at the start of December and peaked just after the Christmas holiday period. In contrast to previous influenza A(H3N2) seasons, influenza cases seen in primary care tended to be younger to middle aged adults. Those seen in hospital and ICU with confirmed influenza tended, as normal, to be older and elderly adults. The season was unusual compared to recent years as influenza B was only confirmed in a very small number (<5%) of cases.

During the 2016/17 influenza season there were fewer cases of influenza-like illness diagnosed in general practice and fewer cases confirmed in hospitals and in ICU/ HDU, compared with the previous year. The absence of influenza B circulation may partly explain the lower number of cases.

It is reported that the 2016/17 Northern hemisphere influenza vaccinations provided moderate protection against circulating influenza A(H3N2) viruses, however evidence suggests that vaccine effectiveness appeared lower in older age-groups.

Once again, more people in eligible groups in Wales received influenza vaccine this season than ever before, although uptake rates have remained stable due to an increase in the number of eligible individuals. Increases in uptake were seen in pregnant women, healthcare staff and some parts of 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>

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8. Appendix A: Influenza Immunisation Data Tables

Table A1. Uptake of influenza immunisation in Wales 2016/17.

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 (%)
Abertawe Bro Morgannwg UHB									
Bridgend LA	21,447	31,638	67.8	8,728	19,779	44.1	18	18	100.0
Neath Port Talbot LA	18,517	28,657	64.6	7,836	17,446	44.9	21	21	100.0
Swansea LA	31,171	49,089	63.5	12,332	28,936	42.6	34	34	100.0
Health Board Total	71,135	109,384	65.0	28,896	66,161	43.7	73	73	100.0
Aneurin Bevan UHB									
Blaenau Gwent LA	9,140	14,161	64.5	4,379	9,353	46.8	11	11	100.0
Caerphilly LA	23,291	34,971	66.6	10,979	22,322	49.2	25	25	100.0
Monmouthshire LA	16,956	23,678	71.6	5,901	11,026	53.5	13	13	100.0
Newport LA	18,120	26,425	68.6	8,701	17,553	49.6	18	18	100.0
Torfaen LA	12,907	18,761	68.8	6,156	12,413	49.6	13	13	100.0
Health Board Total	80,414	117,996	68.1	36,116	72,667	49.7	80	80	100.0
Betsi Cadwaladr UHB									
Anglesey LA	11,167	16,239	68.8	4,094	8,097	50.6	11	11	100.0
Conwy LA	20,203	29,820	67.7	6,150	12,964	47.4	19	19	100.0
Denbighshire LA	15,559	23,791	65.4	5,572	12,401	44.9	14	14	100.0
Flintshire LA	21,906	30,824	71.1	9,243	17,641	52.4	22	22	100.0
Gwynedd LA	17,969	27,199	66.1	6,422	13,764	46.7	22	22	100.0
Wrexham LA	20,527	28,438	72.2	8,850	16,977	52.1	21	21	100.0
Health Board Total	107,331	156,311	68.7	40,331	81,844	49.3	109	109	100.0
Cardiff and Vale UHB									
Cardiff LA	36,214	52,961	68.4	20,465	41,909	48.8	50	50	100.0
Vale of Glamorgan LA	18,005	25,670	70.1	6,634	14,175	46.8	16	16	100.0
Health Board Total	54,219	78,631	69.0	27,099	56,084	48.3	66	66	100.0
Cwm Taf UHB									
Merthyr Tydfil LA	6,997	10,833	64.6	3,158	7,355	42.9	9	9	100.0
Rhondda Cynon Taff LA	30,064	46,241	65.0	13,300	29,060	45.8	33	33	100.0
Health Board Total	37,061	57,074	64.9	16,458	36,415	45.2	42	42	100.0
Hywel Dda UHB									
Carmarthenshire LA	26,118	40,364	64.7	8,621	20,651	41.7	25	25	100.0
Ceredigion LA	13,088	22,017	59.4	3,881	9,522	40.8	14	14	100.0
Pembrokeshire LA	18,936	29,322	64.6	6,310	14,248	44.3	14	14	100.0
Health Board Total	58,142	91,703	63.4	18,812	44,421	42.3	53	53	100.0
Powys Teaching HB									
	23,489	36,736	63.9	7,285	15,837	46.0	17	17	100.0
Wales Total	431,791	647,835	66.7	174,997	373,429	46.9	440	440	100.0

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 2016/17.

Local Authority	Total patients aged 6m to 64y	Chronic heart disease				Chronic respiratory disease				Chronic kidney disease				Diabetes			
		With condition (n)	Immunised (%)	Uptake (n)	Uptake (%)	With condition (n)	Immunised (%)	Uptake (n)	Uptake (%)	With condition (n)	Immunised (%)	Uptake (n)	Uptake (%)	With condition (n)	Immunised (%)	Uptake (n)	Uptake (%)
Abertawe Bro Morgannwg UHB																	
Bridgend LA	127,531	3,819	3.0	1,712	44.8	10,001	7.8	4,388	43.9	948	0.7	457	48.2	4,567	3.6	2,650	58.0
Neath Port Talbot LA	110,265	3,149	2.9	1,403	44.6	8,893	8.1	3,965	44.6	1,080	1.0	528	48.9	4,208	3.8	2,477	58.9
Swansea LA	207,549	4,988	2.4	2,175	43.6	14,917	7.2	6,343	42.5	1,000	0.5	452	45.2	6,530	3.1	3,697	56.6
Health Board Total	445,345	11,956	2.7	5,290	44.2	33,811	7.6	14,696	43.5	3,028	0.7	1,437	47.5	15,305	3.4	8,824	57.7
Aneurin Bevan UHB																	
Blaenau Gwent LA	58,513	1,580	2.7	779	49.3	4,711	8.1	2,251	47.8	414	0.7	208	50.2	2,436	4.2	1,387	56.9
Caerphilly LA	152,108	3,886	2.6	1,928	49.6	11,112	7.3	5,471	49.2	798	0.5	417	52.3	5,780	3.8	3,669	63.5
Monmouthshire LA	76,930	1,924	2.5	976	50.7	5,604	7.3	2,970	53.0	435	0.6	271	62.3	2,378	3.1	1,614	67.9
Newport LA	129,486	2,785	2.2	1,368	49.1	8,857	6.8	4,406	49.7	630	0.5	350	55.6	4,583	3.5	2,787	60.8
Torfaen LA	76,341	2,163	2.8	1,058	48.9	6,460	8.5	3,170	49.1	383	0.5	219	57.2	2,892	3.8	1,763	61.0
Health Board Total	493,378	12,338	2.5	6,109	49.5	36,744	7.4	18,268	49.7	2,660	0.5	1,465	55.1	18,069	3.7	11,220	62.1
Betsi Cadwaladr UHB																	
Anglesey LA	49,511	1,170	2.4	598	51.1	4,569	9.2	2,236	48.9	315	0.6	182	57.8	1,642	3.3	1,051	64.0
Conwy LA	86,980	2,167	2.5	1,063	49.1	6,855	7.9	3,258	47.5	559	0.6	290	51.9	2,711	3.1	1,594	58.8
Denbighshire LA	79,247	2,138	2.7	1,007	47.1	6,618	8.4	2,935	44.3	518	0.7	252	48.6	2,660	3.4	1,531	57.6
Flintshire LA	121,832	2,870	2.4	1,582	55.1	9,280	7.6	4,737	51.0	716	0.6	422	58.9	3,769	3.1	2,486	66.0
Gwynedd LA	101,563	2,060	2.0	982	47.7	7,534	7.4	3,429	45.5	612	0.6	299	48.9	2,707	2.7	1,654	61.1
Wrexham LA	119,988	2,934	2.4	1,478	50.4	9,087	7.6	4,716	51.9	724	0.6	437	60.4	3,620	3.0	2,350	64.9
Health Board Total	559,121	13,339	2.4	6,710	50.3	43,943	7.9	21,311	48.5	3,444	0.6	1,882	54.6	17,109	3.1	10,666	62.3
Cardiff and Vale UHB																	
Cardiff LA	339,630	6,431	1.9	3,005	46.7	22,290	6.6	10,822	48.6	1,324	0.4	702	53.0	9,390	2.8	6,165	65.7
Vale of Glamorgan LA	102,298	2,424	2.4	1,144	47.2	7,417	7.3	3,395	45.8	435	0.4	217	49.9	2,951	2.9	1,863	63.1
Health Board Total	441,928	8,855	2.0	4,149	46.9	29,707	6.7	14,217	47.9	1,759	0.4	919	52.2	12,341	2.8	8,028	65.1
Cwm Taf UHB																	
Merthyr Tydfil LA	49,757	1,411	2.8	568	40.3	3,718	7.5	1,682	45.2	280	0.6	124	44.3	1,843	3.7	1,030	55.9
Rhondda Cynon Taff LA	199,740	4,975	2.5	2,293	46.1	14,818	7.4	6,799	45.9	1,375	0.7	658	47.9	7,016	3.5	4,284	61.1
Health Board Total	249,497	6,386	2.6	2,861	44.8	18,536	7.4	8,481	45.8	1,655	0.7	782	47.3	8,859	3.6	5,314	60.0
Hywel Dda UHB																	
Carmarthenshire LA	138,389	3,659	2.6	1,550	42.4	10,492	7.6	4,205	40.1	775	0.6	369	47.6	4,829	3.5	2,708	56.1
Ceredigion LA	73,026	1,681	2.3	693	41.2	4,766	6.5	1,870	39.2	372	0.5	170	45.7	2,074	2.8	1,190	57.4
Pembrokeshire LA	90,884	2,515	2.8	1,104	43.9	7,160	7.9	3,082	43.0	580	0.6	292	50.3	3,026	3.3	1,790	59.2
Health Board Total	302,299	7,855	2.6	3,347	42.6	22,418	7.4	9,157	40.8	1,727	0.6	831	48.1	9,929	3.3	5,688	57.3
Powys Teaching HB																	
	106,695	3,014	2.8	1,322	43.9	7,996	7.5	3,744	46.8	687	0.6	352	51.2	3,198	3.0	1,943	60.8
Wales Total																	
	2,598,263	63,743	2.5	29,788	46.7	193,155	7.4	89,874	46.5	14,960	0.6	7,668	51.3	84,810	3.3	51,683	60.9

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 2016/17.

Local Authority	Total patients aged 6m to 64y	Immuno-supression				Chronic liver disease				Neurological conditions				Morbidly obese				Asplenia/splenic			
		With condition (n)	Immunised (%)	Uptake (n)	Uptake (%)	With condition (n)	Immunised (%)	Uptake (n)	Uptake (%)	With condition (n)	Immunised (%)	Uptake (n)	Uptake (%)	With condition (n)	Immunised (%)	Uptake (n)	Uptake (%)	With condition (n)	Immunised (%)	Uptake (n)	Uptake (%)
Abertawe Bro Morgannwg UHB																					
Bridgend LA	127,531	976	0.8	475	48.7	441	0.3	180	40.8	1,992	1.6	845	42.4	4,120	3.2	1,247	30.3	480	0.4	174	36.3
Neath Port Talbot LA	110,265	838	0.8	416	49.6	389	0.4	166	42.7	1,713	1.6	782	45.7	3,970	3.6	1,231	31.0	385	0.3	158	41.0
Swansea LA	207,549	1,634	0.8	744	45.5	791	0.4	324	41.0	2,934	1.4	1,191	40.6	5,497	2.6	1,440	26.2	774	0.4	249	32.2
Health Board Total	445,345	3,448	0.8	1,635	47.4	1,621	0.4	670	41.3	6,639	1.5	2,818	42.4	13,587	3.1	3,918	28.8	1,639	0.4	581	35.4
Aneurin Bevan UHB																					
Blaenau Gwent LA	58,513	637	1.1	384	60.3	257	0.4	111	43.2	898	1.5	375	41.8	2,281	3.9	701	30.7	218	0.4	73	33.5
Caerphilly LA	152,108	1,370	0.9	774	56.5	519	0.3	204	39.3	2,167	1.4	955	44.1	5,737	3.8	1,697	29.6	567	0.4	226	39.9
Monmouthshire LA	76,930	785	1.0	509	64.8	230	0.3	128	55.7	1,089	1.4	566	52.0	2,048	2.7	852	41.6	354	0.5	151	42.7
Newport LA	129,486	1,070	0.8	628	58.7	406	0.3	172	42.4	1,600	1.2	748	46.8	4,037	3.1	1,249	30.9	465	0.4	174	37.4
Torfaen LA	76,341	776	1.0	487	62.8	308	0.4	148	48.1	1,234	1.6	581	47.1	2,507	3.3	912	36.4	363	0.5	182	50.1
Health Board Total	493,378	4,638	0.9	2,782	60.0	1,720	0.3	763	44.4	6,988	1.4	3,225	46.2	16,610	3.4	5,411	32.6	1,967	0.4	806	41.0
Betsi Cadwaladr UHB																					
Anglesey LA	49,511	620	1.3	416	67.1	180	0.4	94	52.2	761	1.5	390	51.2	1,508	3.0	555	36.8	188	0.4	88	46.8
Conwy LA	86,980	814	0.9	462	56.8	344	0.4	143	41.6	1,253	1.4	569	45.4	2,159	2.5	651	30.2	408	0.5	151	37.0
Denbighshire LA	79,247	816	1.0	465	57.0	300	0.4	128	42.7	1,231	1.6	536	43.5	2,100	2.6	693	33.0	352	0.4	136	38.6
Flintshire LA	121,832	1,261	1.0	765	60.7	424	0.3	210	49.5	1,507	1.2	775	51.4	3,378	2.8	1,164	34.5	530	0.4	247	46.6
Gwynedd LA	101,563	1,018	1.0	616	60.5	326	0.3	123	37.7	1,161	1.1	513	44.2	2,306	2.3	763	33.1	363	0.4	136	37.5
Wrexham LA	119,988	1,055	0.9	645	61.1	388	0.3	171	44.1	1,420	1.2	730	51.4	3,533	2.9	1,208	34.2	489	0.4	216	44.2
Health Board Total	559,121	5,584	1.0	3,369	60.3	1,962	0.4	869	44.3	7,333	1.3	3,513	47.9	14,984	2.7	5,034	33.6	2,330	0.4	974	41.8
Cardiff and Vale UHB																					
Cardiff LA	339,630	2,648	0.8	1,502	56.7	949	0.3	411	43.3	3,755	1.1	1,726	46.0	7,330	2.2	2,360	32.2	1,448	0.4	499	34.5
Vale of Glamorgan LA	102,298	839	0.8	477	56.9	259	0.3	114	44.0	1,442	1.4	662	45.9	2,581	2.5	842	32.6	451	0.4	177	39.2
Health Board Total	441,928	3,487	0.8	1,979	56.8	1,208	0.3	525	43.5	5,197	1.2	2,388	45.9	9,911	2.2	3,202	32.3	1,899	0.4	676	35.6
Cwm Taf UHB																					
Merthyr Tydfil LA	49,757	336	0.7	155	46.1	180	0.4	58	32.2	736	1.5	283	38.5	1,797	3.6	435	24.2	172	0.3	57	33.1
Rhondda Cynon Taff LA	199,740	1,530	0.8	792	51.8	777	0.4	284	36.6	2,858	1.4	1,239	43.4	7,250	3.6	2,038	28.1	683	0.3	254	37.2
Health Board Total	249,497	1,866	0.7	947	50.8	957	0.4	342	35.7	3,594	1.4	1,522	42.3	9,047	3.6	2,473	27.3	855	0.3	311	36.4
Hywel Dda UHB																					
Carmarthenshire LA	138,389	1,247	0.9	623	50.0	438	0.3	171	39.0	2,221	1.6	962	43.3	4,342	3.1	1,220	28.1	488	0.4	181	37.1
Ceredigion LA	73,026	624	0.9	310	49.7	230	0.3	83	36.1	972	1.3	386	39.7	1,765	2.4	474	26.9	290	0.4	92	31.7
Pembrokeshire LA	90,884	1,089	1.2	636	58.4	505	0.6	219	43.4	1,528	1.7	636	41.6	2,544	2.8	810	31.8	428	0.5	168	39.3
Health Board Total	302,299	2,960	1.0	1,569	53.0	1,173	0.4	473	40.3	4,721	1.6	1,984	42.0	8,651	2.9	2,504	28.9	1,206	0.4	441	36.6
Powys Teaching HB																					
	106,695	1,041	1.0	576	55.3	324	0.3	153	47.2	1,673	1.6	723	43.2	2,731	2.6	885	32.4	488	0.5	186	38.1
Wales Total	2,598,263	23,024	0.9	12,857	55.8	8,965	0.3	3,795	42.3	36,145	1.4	16,173	44.7	75,521	2.9	23,427	31.0	10,384	0.4	3,975	38.3

Table A3. Uptake of influenza immunisation in pregnant women, with breakdown for those who have another clinical risk condition in Wales 2016/17.

Local Authority	Pregnant women with clinical risk			Pregnant women without clinical			Total pregnant women		
	Immunised (n)	Denominator (n)	Uptake (%)	Immunised (n)	Denominator (n)	Uptake (%)	Immunised (n)	Denominator (n)	Uptake (%)
Abertawe Bro Morgannwg UHB									
Bridgend LA	90	182	49.5	478	1,277	37.4	568	1459	38.9
Neath Port Talbot LA	62	99	62.6	376	835	45.0	438	934	46.9
Swansea LA	121	216	56.0	724	1,703	42.5	845	1919	44.0
Health Board Total	273	497	54.9	1,578	3,815	41.4	1851	4312	42.9
Aneurin Bevan UHB									
Blaenau Gwent LA	43	90	47.8	256	619	41.4	299	709	42.2
Caerphilly LA	89	147	60.5	514	1,134	45.3	603	1281	47.1
Monmouthshire LA	59	100	59.0	371	711	52.2	430	811	53.0
Newport LA	98	167	58.7	655	1,522	43.0	753	1689	44.6
Torfaen LA	69	123	56.1	371	809	45.9	440	932	47.2
Health Board Total	358	627	57.1	2,167	4,795	45.2	2525	5422	46.6
Betsi Cadwaladr UHB									
Anglesey LA	53	92	57.6	342	647	52.9	395	739	53.5
Conwy LA	67	129	51.9	352	841	41.9	419	970	43.2
Denbighshire LA	86	162	53.1	421	983	42.8	507	1145	44.3
Flintshire LA	124	185	67.0	691	1,376	50.2	815	1561	52.2
Gwynedd LA	94	154	61.0	528	1,055	50.0	622	1209	51.4
Wrexham LA	112	180	62.2	709	1,450	48.9	821	1630	50.4
Health Board Total	536	902	59.4	3,043	6,352	47.9	3579	7254	49.3
Cardiff and Vale UHB									
Cardiff LA	295	461	64.0	1,732	3,513	49.3	2027	3974	51.0
Vale of Glamorgan LA	85	139	61.2	547	1,061	51.6	632	1200	52.7
Health Board Total	380	600	63.3	2,279	4,574	49.8	2659	5174	51.4
Cwm Taf UHB									
Merthyr Tydfil LA	36	68	52.9	192	464	41.4	228	532	42.9
Rhondda Cynon Taff LA	103	181	56.9	640	1,443	44.4	743	1624	45.8
Health Board Total	139	249	55.8	832	1,907	43.6	971	2156	45.0
Hywel Dda UHB									
Carmarthenshire LA	78	156	50.0	502	1,200	41.8	580	1356	42.8
Ceredigion LA	41	71	57.7	190	476	39.9	231	547	42.2
Pembrokeshire LA	71	127	55.9	326	844	38.6	397	971	40.9
Health Board Total	190	354	53.7	1,018	2,520	40.4	1208	2874	42.0
Powys Teaching HB									
	102	163	62.6	515	1,049	49.1	617	1212	50.9
Wales Total	1,978	3,392	58.3	11,432	25,012	45.7	13410	28404	47.2

Table A4. Uptake of influenza immunisation in those aged six months to 64 years and recorded as being a carer in Wales in 2016/17.

Local Authority	Total carers		
	Immunised (n)	Denominator (n)	Uptake (%)
Abertawe Bro Morgannwg UHB			
Bridgend LA	571	1,093	52.2
Neath Port Talbot LA	452	858	52.7
Swansea LA	678	1,596	42.5
Health Board Total	1,701	3,547	48.0
Aneurin Bevan UHB			
Blaenau Gwent LA	228	434	52.5
Caerphilly LA	719	1,335	53.9
Monmouthshire LA	716	1,267	56.5
Newport LA	757	1,683	45.0
Torfaen LA	658	1,146	57.4
Health Board Total	3,078	5,865	52.5
Betsi Cadwaladr UHB			
Anglesey LA	441	738	59.8
Conwy LA	531	1,088	48.8
Denbighshire LA	550	1,225	44.9
Flintshire LA	894	1,865	47.9
Gwynedd LA	559	1,028	54.4
Wrexham LA	929	1,914	48.5
Health Board Total	3,904	7,858	49.7
Cardiff and Vale UHB			
Cardiff LA	985	2,071	47.6
Vale of Glamorgan LA	397	776	51.2
Health Board Total	1,382	2,847	48.5
Cwm Taf UHB			
Merthyr Tydfil LA	155	298	52.0
Rhondda Cynon Taff LA	935	1,767	52.9
Health Board Total	1,090	2,065	52.8
Hywel Dda UHB			
Carmarthenshire LA	901	1,888	47.7
Ceredigion LA	476	1,088	43.8
Pembrokeshire LA	766	1,843	41.6
Health Board Total	2,143	4,819	44.5
Powys Teaching HB			
	552	1,169	47.2
Wales Total	13,850	28,170	49.2

Table A5. Uptake of influenza immunisation, through general practice, in children aged two and three years in Wales in 2016/17.

Local Authority	Two year olds			Three year olds		
	Immunised (n)	Denominator (n)	Uptake (%)	Immunised (n)	Denominator (n)	Uptake (%)
Abertawe Bro Morgannwg UHB						
Bridgend LA	872	1,714	50.9	805	1,848	43.6
Neath Port Talbot LA	664	1,421	46.7	584	1,470	39.7
Swansea LA	1,140	2,644	43.1	1,110	2,684	41.4
Health Board Total	2,676	5,779	46.3	2,499	6,002	41.6
Aneurin Bevan UHB						
Blaenau Gwent LA	353	822	42.9	361	813	44.4
Caerphilly LA	916	2,083	44.0	942	2,150	43.8
Monmouthshire LA	531	888	59.8	604	1,001	60.3
Newport LA	829	1,999	41.5	793	2,032	39.0
Torfaen LA	487	1,054	46.2	512	1,142	44.8
Health Board Total	3,116	6,846	45.5	3,212	7,138	45.0
Betsi Cadwaladr UHB						
Anglesey LA	334	696	48.0	350	736	47.6
Conwy LA	507	1,092	46.4	576	1,171	49.2
Denbighshire LA	486	1,104	44.0	512	1,153	44.4
Flintshire LA	885	1,606	55.1	969	1,649	58.8
Gwynedd LA	591	1,261	46.9	692	1,326	52.2
Wrexham LA	843	1,693	49.8	844	1,770	47.7
Health Board Total	3,646	7,452	48.9	3,943	7,805	50.5
Cardiff and Vale UHB						
Cardiff LA	2,066	4,631	44.6	2,046	4,584	44.6
Vale of Glamorgan LA	654	1,357	48.2	716	1,462	49.0
Health Board Total	2,720	5,988	45.4	2,762	6,046	45.7
Cwm Taf UHB						
Merthyr Tydfil LA	254	729	34.8	221	727	30.4
Rhondda Cynon Taff LA	1,142	2,768	41.3	1,459	2,825	51.6
Health Board Total	1,396	3,497	39.9	1,680	3,552	47.3
Hywel Dda UHB						
Carmarthenshire LA	755	1,810	41.7	750	1,923	39.0
Ceredigion LA	289	790	36.6	291	822	35.4
Pembrokeshire LA	493	1,260	39.1	414	1,201	34.5
Health Board Total	1,537	3,860	39.8	1,455	3,946	36.9
Powys Teaching HB						
	693	1,349	51.4	621	1,333	46.6
Wales Total	15,784	34,771	45.4	16,172	35,822	45.1

Appendix B: Additional and health board level influenza surveillance data

Table B1. Influenza-like illness diagnosed in general practices in Wales in 2016/17, by health board.

Health Board	Influenza-like illness clinically diagnosed	
	n	%
Abertawe Bro Morgannwg HB	1136	16.2
Aneurin Bevan HB	1188	17.0
Betsi Cadwaladr UHB	1402	20.0
Cardiff & Vale UHB	1498	21.4
Cwm Taf HB	689	9.9
Hywel Dda HB	789	11.3
Powys Teaching HB	292	4.2
Total	6994	100

Table B2. Non ICU/ HDU and non Accident and Emergency hospital ward patients providing samples for respiratory screen testing, with numbers testing positive for influenza and RSV in Wales in 2016/17, by health board.

Health Board	Influenza A		Influenza B		RSV		Negative		All screens	
	n	%	n	%	n	%	n	%	n	%
Abertawe Bro Morgannwg HB	33	9.9%	0	0.0%	14	3.9%	121	8.2%	207	7.2%
Aneurin Bevan HB	25	7.5%	4	44.4%	13	3.6%	67	4.5%	141	4.9%
Betsi Cadwaladr UHB	13	3.9%	0	0.0%	32	8.9%	53	3.6%	149	5.2%
Cardiff & Vale UHB	183	55.0%	5	55.6%	255	70.6%	968	65.2%	1882	65.2%
Cwm Taf HB	3	0.9%	0	0.0%	12	3.3%	24	1.6%	55	1.9%
Hywel Dda HB	70	21.0%	0	0.0%	31	8.6%	194	13.1%	375	13.0%
Powys Teaching HB	6	1.8%	0	0.0%	4	1.1%	57	3.8%	79	2.7%
Total	333	100%	9	100%	361	100%	1484	100%	2888	100%

Table B3. Accident and Emergency ward patients providing samples for respiratory screen testing, with numbers testing positive for influenza and RSV in Wales in 2016/17, by health board.

Health Board	Influenza A		Influenza B		RSV		Negative		All screens	
	n	%	n	%	n	%	n	%	n	%
Abertawe Bro Morgannwg HB	30	12.0%	1	20.0%	86	43.4%	75	11.9%	267	18.4%
Aneurin Bevan HB	17	6.8%	1	20.0%	3	1.5%	30	4.8%	58	4.0%
Betsi Cadwaladr UHB	7	2.8%	0	0.0%	1	0.5%	17	2.7%	36	2.5%
Cardiff & Vale UHB	166	66.1%	1	20.0%	102	51.5%	434	68.8%	952	65.7%
Cwm Taf HB	3	1.2%	0	0.0%	0	0.0%	13	2.1%	16	1.1%
Hywel Dda HB	28	11.2%	2	40.0%	6	3.0%	62	9.8%	119	8.2%
Powys Teaching HB	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Total	251	100%	5	100%	198	100%	631	100%	1448	100%

Table B4. ICU/ HDU ward patients providing samples for respiratory screen testing, with numbers testing positive for influenza and RSV in Wales in 2016/17, by health board.

Health Board	Influenza A		Influenza B		RSV		Negative		All screens	
	n	%	n	%	n	%	n	%	n	%
Abertawe Bro Morgannwg HB	28	38.4%	1	100.0%	19	30.2%	172	37.9%	256	34.0%
Aneurin Bevan HB	7	9.6%	0	0.0%	4	6.3%	41	9.0%	76	10.1%
Betsi Cadwaladr UHB	8	11.0%	0	0.0%	0	0.0%	41	9.0%	71	9.4%
Cardiff & Vale UHB	6	8.2%	0	0.0%	33	52.4%	102	22.5%	195	25.9%
Cwm Taf HB	4	5.5%	0	0.0%	2	3.2%	17	3.7%	31	4.1%
Hywel Dda HB	20	27.4%	0	0.0%	5	7.9%	81	17.8%	125	16.6%
Powys Teaching HB	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Total	73	100%	1	100%	63	100%	454	100%	754	100%

Table B5. Numbers of patients tested and confirmed with influenza, by location of patient at time of sampling in 2016/17, 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	2	1	4	16	10	7	23	5	6
Non-sentinel practices	0	0	1	0	3	7	2	13	3	14
A&E Wards	9	13	7	5	18	9	18	59	41	77
Other Hospital Wards	9	13	6	13	19	12	9	62	53	145
Intensive care wards	1	0	1	1	2	1	4	18	20	26
Unknown location	1	1	0	0	1	2	1	1	1	11

Table B6. Numbers of patients tested and confirmed with RSV, by location of patient at time of sampling in 2016/17, 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	1	0	1	4	2	1	4	1	2
Non-sentinel practices	0	1	0	1	1	1	1	2	0	6
A&E Wards	90	45	3	0	1	2	1	9	17	30
Other Hospital Wards	186	49	10	2	11	5	2	17	34	45
Intensive care wards	37	4	0	0	1	1	3	4	7	6
Unknown location	11	3	0	0	0	0	1	2	0	1

Table B7. Numbers of patients providing samples for respiratory screen testing, by location of patient at time of sampling in 2016/17, 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	2	4	1	11	29	18	18	45	9	9
Non-sentinel practices	2	2	1	2	8	8	9	25	5	27
A&E Wards	192	134	32	14	37	36	44	105	79	144
Other Hospital Wards	360	208	56	29	67	69	39	161	145	269
Intensive care wards	70	18	6	3	8	3	12	54	59	67
Unknown location	24	7	2	1	2	2	2	11	4	14