GIG CYMRU NHS WALES

Iechyd Cyhoeddus Cymru

Public Health Wales

Seasonal influenza in Wales 2015/16

Annual Report

Summary

The 2015/16 influenza season in Wales saw late but prolonged activity which reached moderate levels. Influenza virus was detected in the community each week from mid December 2015 until April 2016 and clinical consultation rates in general practice exceeded the threshold for seasonal activity from the start of January until April 2016. Consultation rates for influenza-like illness (ILI) in general practice were slightly higher compared to those seen during 2014/15 and the season peaked 10 weeks later. There were 21 outbreaks of ILI or acute respiratory illness reported to Public Health Wales Health Protection Teams, mainly from hospital settings. A higher proportion of individuals in the middle-age groups were affected compared to the 2014/15 season and there was a lower level of seasonal excess mortality.

At the start of the season the dominant circulating influenza virus type was A(H1N1)pdm09, however there was an increase in the proportion of cases due to influenza B during March to April. Circulating influenza A viruses appeared well matched to the types contained in the 2015/16 Northern Hemisphere influenza vaccine. The predominant circulating type of influenza B in Wales was a Victoria lineage virus, different from the Yamagata lineage virus contained in the trivalent seasonal influenza vaccine. The live attenuated intranasal quadrivalent influenza vaccine contained both Victoria and Yamagata influenza B lineage viruses. The final overall adjusted estimate for vaccine effectiveness against confirmed influenza in general practice in the United Kingdom during the 2015/16 season was 52%.

More individuals than ever in clinical risk and priority groups in Wales received an influenza vaccine during 2015/16. Although uptake in those aged 65 years and older (66.6%) and those in clinical risk groups (46.9%) decreased slightly compared to the previous season, the number of individuals eligible for and receiving influenza vaccine has increased. This season the universal childhood influenza vaccination programme was extended from children aged two to four years to include children aged five and six years. Coverage of influenza vaccination in pregnant women (75.6%), measured by an annual point of delivery (post-natal) survey, exceeded the 75% target for the first time and vaccine uptake in front-line NHS staff was the highest it has ever been (47.3%).

Key Findings

- Compared to the previous season, 2015/16 saw a change in the age-groups experiencing the highest burden of disease, with the elderly comparatively less affected than last season and younger age-groups comparatively more affected than last season.
    - The crude ILI attack rate in the community during a two week period in late January in England and Wales was 4%. The cumulative attack rate for ILI during the whole season will be higher, especially as Wales saw a marked increase in influenza activity during March.
    - A total of, 9,887 patients with ILI were reported by general practices in Wales throughout the season. Consultation rates were highest in patients aged 25 to 44 years (490 per 100,000 for the season), in contrast to the 2014/15 season where consultation rates were highest in patients aged 45 to 64 years (226 per 100,000)
    - Throughout the season, 779 patients in hospitals were confirmed to have influenza, 125 of whom were in intensive care units.
    - Twenty-one outbreaks of ILI or acute respiratory illness were reported to Public Health Wales, from hospitals, nursing homes, residential homes and care facilities.
    - 2015/16 saw lower levels of seasonal excess mortality than 2014/15, and a lower number of reported community outbreaks. However, slightly higher numbers of flu diagnoses were made in general practices in 2015/16 and higher numbers of patients were confirmed with influenza in hospitals and intensive care units.

- The season was dominated by influenza A(H1N1)pdm09 and influenza B, both of which usually affect children and younger to middle-aged adults in higher numbers than the elderly.

- The season started later than in previous years and influenza A(H1N1)pdm09 was dominant from December to early March, with higher levels of influenza B was dominant from mid March to May.

- Circulating influenza A was well-matched to the seasonal influenza vaccine virus strains, however the dominant type of influenza B virus in Wales during 2015/16 was a Victoria lineage virus, different to the Yamagata lineage virus contained in the trivalent seasonal influenza vaccine. The live attenuated intranasal quadrilvalent vaccine, which is used in the universal childhood influenza immunisation programme contains viruses of both these lineages of influenza B

- The overall vaccine effectiveness against confirmed influenza in general practice for influenza vaccines in the UK this season was 52%.

- More influenza vaccinations were given in Wales during 2015/16 than ever before, however percentage uptake in the population decreased slightly in people aged 65 years and over, and in a number of at risk groups.
    - Influenza vaccine uptake in those aged 65 years and older in Wales was 66.6% during 2015/16, compared to 68.0% last season.
    - Uptake of influenza vaccine in patients aged six months to 64 years in a clinical risk group was 46.9%, compared to 49.3% last season. Uptake among clinical risk groups was highest in patients with diabetes (62.3%) and lowest in patients with chronic liver disease (40.6%).
    - Uptake of influenza vaccine in people younger than 65 years and recorded as being morbidly obese but not in any other clinical risk group was 34.8%.

    - Uptake of influenza vaccine in pregnant women who went on to give birth during February and April 2016 was 75.6% (measured in an annual survey of women in major maternity units), an increase of 3.2 from 72.4% 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 49.1%.

- Uptake of influenza vaccine in children aged two and three years, immunised in general practices, was 44.4%.

- Uptake of influenza vaccine in children aged four to six years, immunised in school immunisation sessions, was 63.4%.

- Uptake of influenza vaccine in health board and NHS trust staff in Wales, reported by health board and NHS Trust Occupational Health Departments, continues on a positive trend and was 46.0% during 2015/16, an increase of 3.1 from 42.9% last season. Uptake in staff with direct patient contact was 47.3% and exceeded 50% in four health boards and two NHS trusts.

- This is the fifth 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 730,246 for 2015/16 (based on data from 99.8% of practices in Wales), compared to an estimated 723,061 last season, an increase of 1%.

Contents

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. The use of Audit+ as a data collection tool began in 2009/10 and prior to this a paper-based system was used.

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 2015/16, the following influenza surveillance indicators were monitored each week in Wales:

Primary care and community indicators

- GP consultations for ILI
- Sentinel GP virological surveillance
- 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
- The number of hospitals with wards fully or partially closed due to influenza outbreaks (and the number of wards fully or partially closed)

Indicators from other settings

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

In addition, antigenic characterisation of influenza viruses detected and monitoring of winter excess mortality are carried out by Public Health England at an England and Wales level; 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 and minimise the health impact of influenza on the population of Wales [1].

In Wales in 2015/16, 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, and immunosuppression), 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. For the first time, patients who are morbidly obese were also advised to receive influenza immunisation.

In addition, influenza immunisation was also recommended for all health and social care workers who are in direct contact with patients or service users, and members of voluntary organisations providing planned emergency first aid. 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 was introduced, in a phased manner, in September 2013 and included all children aged two and three (as at 31 August 2013). In 2014/15 the programme was extended to include all four year old children and all children in the School Year 7 age group [2]. In 2015, the School Year 7 vaccination was withdrawn and the vaccination of younger age groups extended to include five and six year olds, as well as two to four year olds, (as at 31 August 2015)[1]. During 2015/16, all children aged two to six were recommended to receive live attenuated influenza vaccine (LAIV) nasal spray, with delivery in the two and three year old group being through general practice and delivery in reception class, and School Years 1 and 2 (the four to six year old group) through school nursing services in Wales.

Public Health Wales monitor and report GP influenza immunisation uptake rates throughout the seasonal campaign and produce end of season influenza immunisation coverage statistics at 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 at the end of the immunisation campaign (March 31st). During the 2015/16 campaign, Public Health Wales also provided weekly progress reports for all GPs and health boards in Wales.

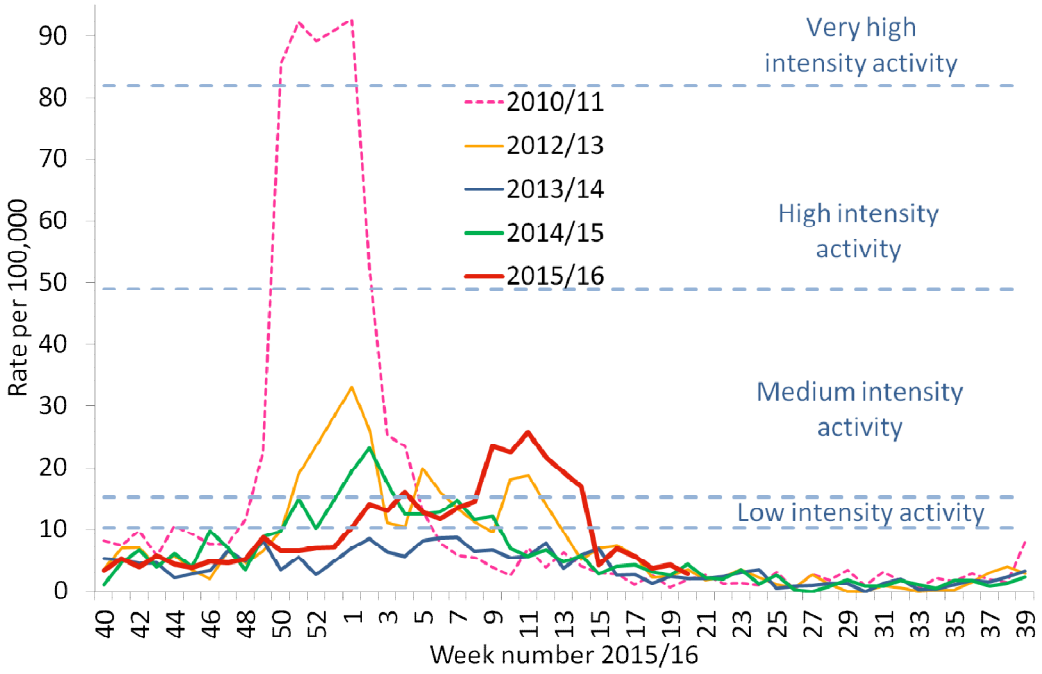
2. Influenza Surveillance Observations from 2015/16

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 in Wales during 2015/16 as an indication of when consultation data suggest that influenza may be circulating in the community. Thresholds for medium intensity activity (15.2), high intensity activity (48.9) and very high intensity activity (81.9) were also introduced in October 2015.

The sentinel GP MEM threshold was first reached during week 1 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 2015/16*



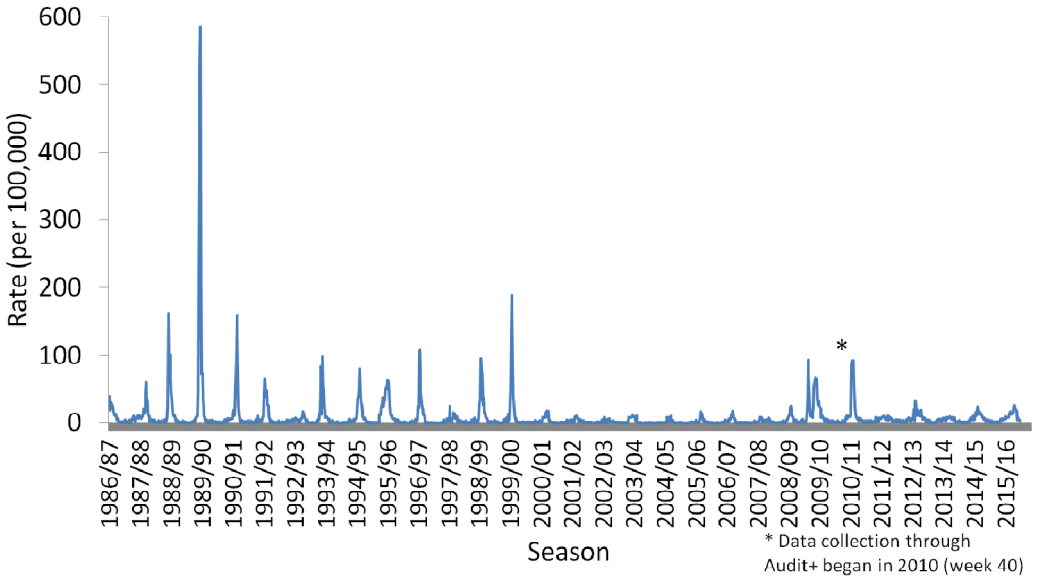
The sentinel GP ILI consultation rate exceeded the threshold for medium levels of intensity in week 4, at this time virological surveillance data indicated influenza activity was predominantly due to influenza A(H1N1)pdm09. Consultation rates fell from week 4 to week 6 2016 but remained above the threshold for seasonal influenza activity. From week 7 2016 the sentinel GP ILI consultation rate began to increase again, reaching medium levels of activity for a second time during week 9. The sentinel GP ILI consultation rate remained above the threshold for medium intensity activity from week 9 to week 15 and peaked during week 11 at 25.8 consultations per 100,000 practice population. Between week 9 and week 15 co-circulation of both influenza A(H1N1)pdm09 and influenza B was seen. The sentinel GP consultation rate for ILI was above baseline levels for 14 weeks in 2015/16 compared to 13 weeks in 2014/15 (Table 2.1.1), it was also above the threshold for medium intensity activity for longer (seven weeks compared to two weeks) and peaked at a higher level. The peak in consultation rate seen during 2015/16 is the third highest reported of the six influenza seasons from 2010/11 onward (Figure 2.1.2).

Table 2.1.1 Comparison of sentinel GP consultation rates from 2012/13 to 2015/16

	Influenza Season			
	2012/13	2013/14	2014/15	2015/16
Week of year in which baseline threshold exceeded	50	Baseline threshold not exceeded	50	1
Weeks sentinel GP ILI consultation rate above baseline threshold (n)	14	0	13	14
Weeks sentinel GP ILI consultation rate above medium activity levels (n)	Not available*	Not available*	2	7
Peak sentinel GP ILI consultation rate	33	8.8	23.2	25.8

** Medium intensity thresholds introduced in 2014/15*

Figure 2.1.2. *Public Health Wales sentinel GP weekly consultation rate for influenza-like illness 1986 to 2016*



The cumulative sentinel GP ILI rate for 2015/16 was higher than any other season since 2010/11, which is a reflection of both the length of the season and the intensity of weekly consultation rates during the season (Figure 2.1.3). Compared to 2014/15 there was a change in the age distribution of ILI cases diagnosed in GP (Figure 2.1.4). During 2015/16, the consultation rate for ILI was highest in patients aged 25 to 44 years (490 per 100,000 for the period 2015 week 40 to 2016 week 20). This is similar to previous seasons dominated by influenza A(H1N1)pdm09 and is in contrast to the 2014/15 season in Wales, dominated by influenza A(H3N2) where consultation rates were higher in patients aged 45 to 65 years (Figure 2.1.4).

During the period 2015 week 40 to 2016 week 20 (September 28th 2015 to May 15th 2016) there were 9,887 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 86% 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. During 2015/16, Public Health Wales participated in a telephone survey, carried out in Wales, England and Scotland which aimed to estimate the attack rate for influenza in the community. Based on information from 2,708 individuals in 1,005 households in England, Wales and Scotland, during 2016 weeks three and four, the crude attack rate for ILI (using the WHO ILI case definition of fever >38 degrees Celsius, cough/sore throat and sudden onset of symptoms) in the community was 3.7%. The reported crude ILI rate from the 410 individuals recruited in Wales from this survey was 4.4% [4]. It is important to keep in mind that the peak in influenza activity in Wales was seen approximately seven weeks after these data were collected. The crude ILI rates calculated from 2015/16 survey data are similar to those reported for the 2014/15 influenza season [5].

Figure 2.1.3. *Cumulative consultation rates for influenza-like illness, per season (from 2015 week 40 to 2016 week 20), in sentinel GP patients 2010/11 to 2015/16*

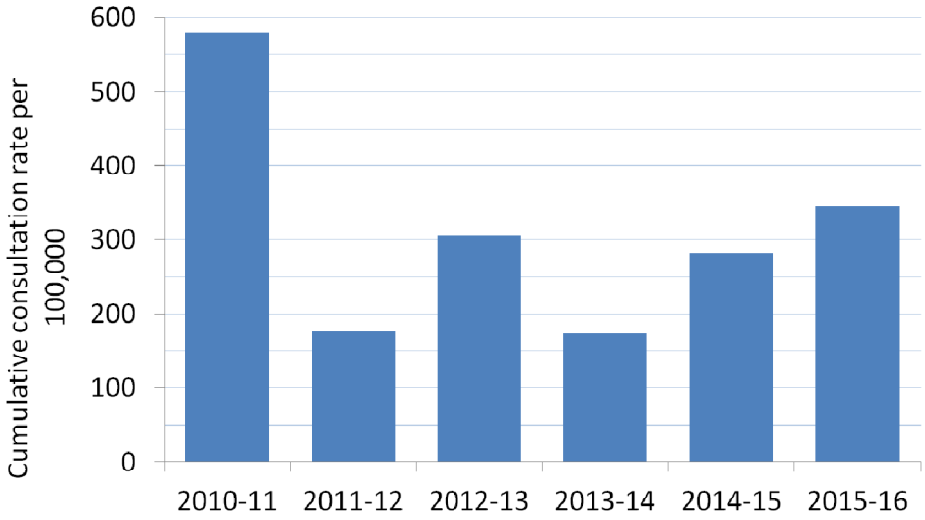
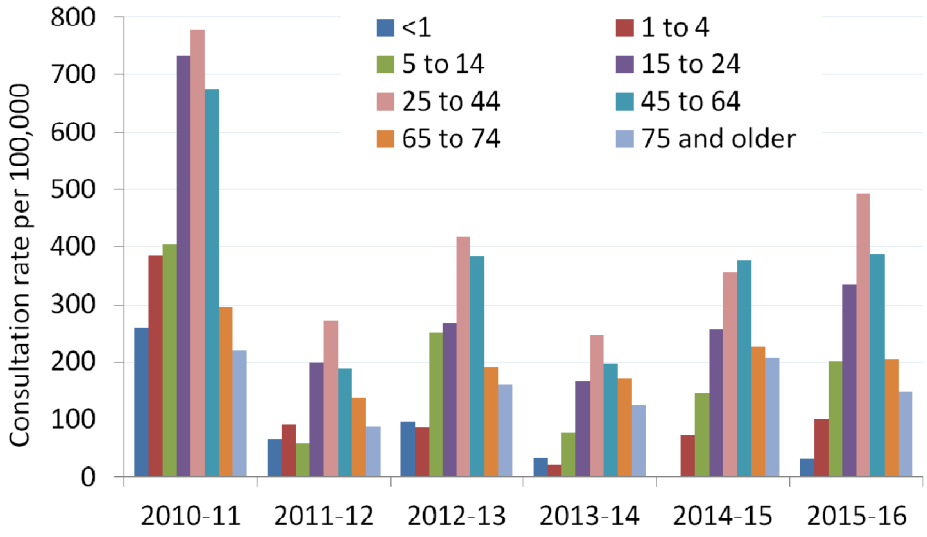


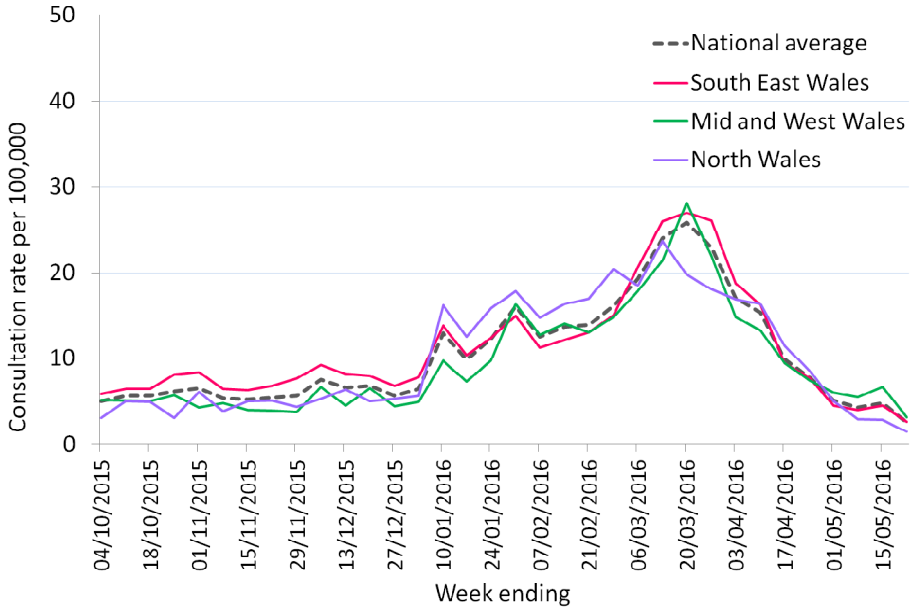
Figure 2.1.4. *Age-group specific cumulative consultation rates for influenza-like illness, per season (from 2015 week 40 to 2016 week 20), in sentinel GP patients 2010/11 to 2015/16*



All available data from practices providing ILI consultation data, though Audit+, between October 2015 and May 2016 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 11 (ending 20 March), at 26.9 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 11 (ending 20 March), at 28.1 per 100,000 practice population.
- In North Wales (Betsi Cadwaladr University Health Board area) the peak in ILI consultation rate was seen during week 10 (ending 20 March), at 23.6 per 100,000 practice population.

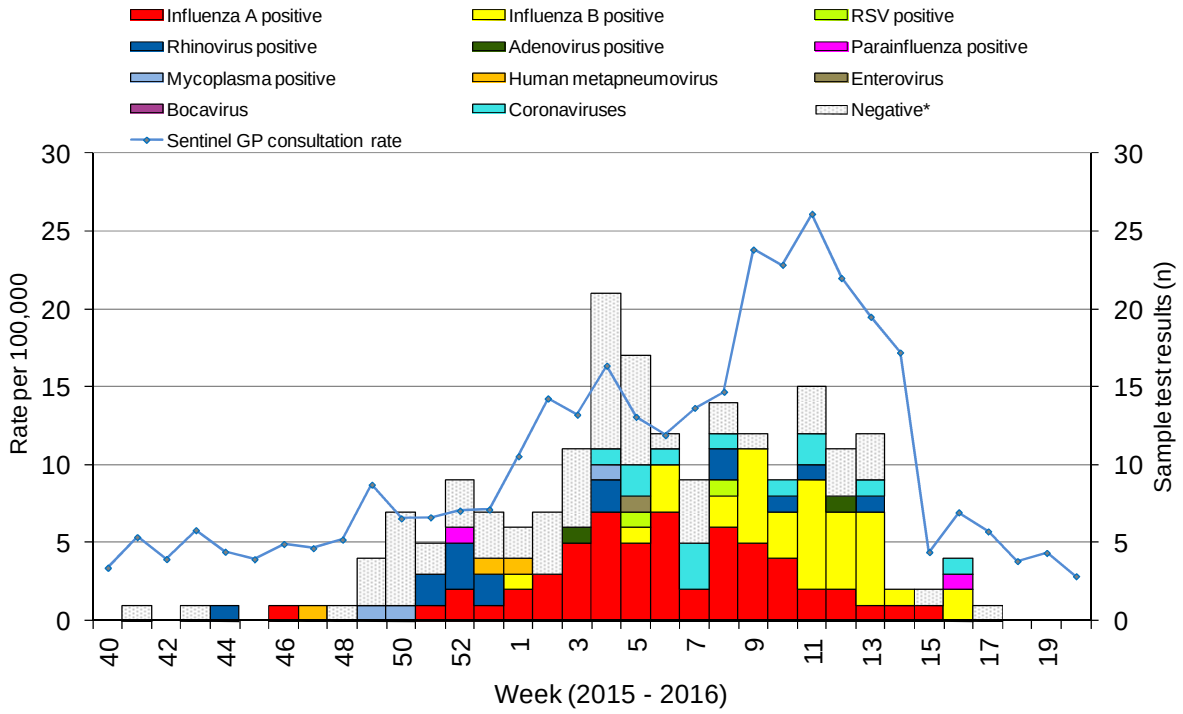
Figure 2.1.5. *Weekly consultation rates for influenza-like illness in regions of Wales, data from all available practices submitted through Audit+, compared to the national average, 2015-2016.*



2.2 Community indicators - Virological surveillance in the community

Between 2015 week 40 and 2016 week 21 (28 September 2015 to 22 May 2016), 198 samples collected from patients diagnosed with ILI in sentinel GP practices were virologically tested. Samples are routinely tested for: influenza, RSV, Adenovirus, *Mycoplasma pneumoniae*, rhinovirus, parainfluenza, human metapneumovirus and enterovirus. Of these, 29% (n=58) tested positive for influenza A and 19% (n=37) tested positive for influenza B. Thirty four percent (n=67) were negative for all routinely tested respiratory organisms. The peak in submissions of samples for testing from patients with influenza symptoms was in week four of 2016 (week ending January 31st 2016, 21 patient samples).

Figure 2.2.1. *Results from Public Health Wales GP sentinel virological surveillance for influenza and other seasonal causes of respiratory illness by Week, 2015-2016. The sentinel GP ILI consultation rate per 100,000 is also included.*



Influenza A was first detected in a sample submitted by a sentinel practice in week 46. Influenza A was then detected every week from 2015 week 51 (week ending 20th December) to 2016 week 15 (week ending 17th April) (Figure 2.2.1). Of the 58 influenza A samples, 98% (n=57) were influenza A(H1) and 2% (n=1) were influenza A(H3). Influenza B was detected later on in the season with the majority of samples (97%) between 2016 week 5 (week ending 7th February) and 2016 week 16 (week ending 24th April).

Table 2.2.1. *Samples from sentinel GP patients with influenza-like symptoms testing positive for influenza A and influenza B between 2015 week 40 and 2016 week 20 by age group.*

Age Group	Samples tested		Influenza A		Influenza B	
	n	%	n	%	n	%
Under 1	0	0.0	0	0.0	0	0.0
1 to 4	1	0.5	1	1.7	0	0.0
5 to 9	7	3.5	3	5.2	2	5.4
10 to 14	10	5.1	3	5.2	4	10.8
15 to 24	27	13.6	5	8.6	9	24.3
25 to 34	45	22.7	15	25.9	9	24.3
35 to 44	30	15.2	12	20.7	2	5.4
45 to 64	54	27.3	12	20.7	9	24.3
65 to 74	19	9.6	6	10.3	2	5.4
75 and older	5	2.5	1	1.7	0	0.0
Total	**198**	-	**58**	-	**37**	-

Twenty seven percent of all the symptomatic patients visiting sentinel practices who were tested for seasonal respiratory pathogens between September 28th 2015 and May 22nd 2016 were aged 45 to 64 years (Table 2.2.1), the median age of patients tested was 38 years.

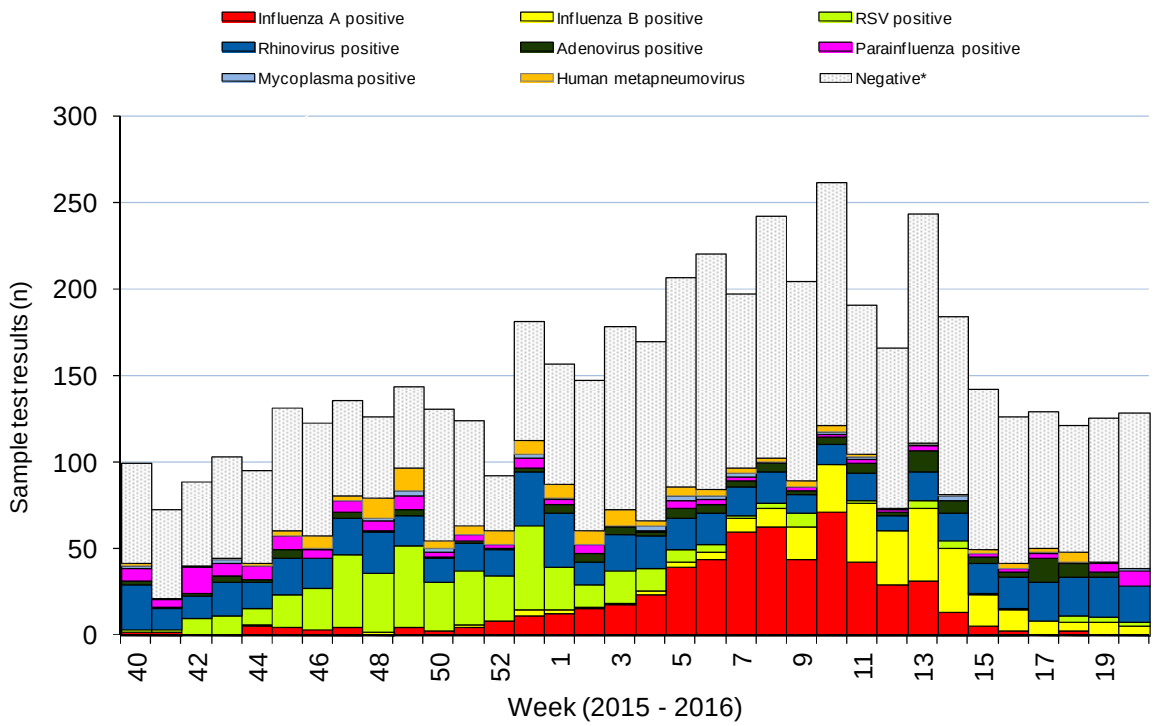
Out of the sentinel GP patients testing positive for influenza A, 26% were aged 25 to 34 years, the median patient age was 36 years. The median age of patients testing positive for influenza B was 30 years, with patients aged 15 to 24 years, 25 to 34 years and 45 to 64 years each accounting for 24% of cases.

2.3 Hospital indicators - Virological surveillance

During the period 2015 week 40 to 2016 week 20 (September 28th 2015 to May 22nd 2016) there were 5,018 episodes of acute respiratory illness in patients for which samples were received and tested by Public Health Wales Microbiology. Of these tests, 98% were carried out on samples collected from patients in hospital locations and 2% were non-sentinel GP samples submitted for testing from other locations in the community. Samples are routinely tested for: influenza, RSV, Adenovirus, *Mycoplasma pneumoniae*, rhinovirus, parainfluenza and human metapneumovirus.

Samples were tested from 5,018 episodes of acute respiratory illness, 12% (n=625) tested positive for rhinovirus, 11% (n=549) tested positive for influenza A, 9% (n=448) tested positive for RSV and 6% (n=285) tested positive for influenza B. Fifty-five percent (n=2889) were negative for all organisms. The peak in submissions of samples for testing from patients with acute respiratory symptoms was in week 10 of 2016 (week ending 13 March 2016, 253 patient samples).

Figure 2.2.2. *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, 2015-2016.*



Sporadic numbers of influenza A were detected from 2015 week 40 to week 47. From 2015 week 49 (week ending 6th December) influenza A virus began to be detected each week in some samples from patients with acute respiratory symptoms in hospitals (Figure 2.2.2). From week 6 (week ending 14th February 2016) influenza B virus began to be detected. The number of samples testing positive for influenza A peaked in week 10 (n=96) whilst the number of samples testing positive for influenza B peaked in week 13 (n=31). In parallel to the peak observed in sentinel GP ILI consultation rate, the percentage of samples testing positive for influenza peaked in week eleven at 41% (n=76), 55% of these were positive for influenza A. From 2016 week two (week ending 17 January) to 2016 week 16 (week ending 24 April) the proportion of samples testing positive for influenza exceeded ten per-cent. Influenza viruses continued to be detected in samples from patients in hospital each week up to week 20 2016 (week ending 22nd May 2016).

Of the 427 influenza A samples that were further typed 98% (n=417) were influenza A(H1) and 2% (n=10) were influenza A(H3).

The peak week for sample test positivity for RSV was week 49 of 2015 (week ending 6th December 2015) (Figure 2.2.2), although small numbers of patient samples continued to test positive for RSV throughout the season.

Table 2.2.2. *Samples from hospital and non-sentinel GP patients testing positive for influenza A, influenza B and RSV between 2015 week 40 and 2016 week 20 by age group.*

	Samples tested		Influenza A		Influenza B		RSV	
Age Group	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Under 1	929	18.5	38	6.9	13	4.6	254	56.8
1 to 4	603	12.0	87	15.8	44	15.4	78	17.4
5 to 9	252	5.0	23	4.2	37	13.0	14	3.1
10 to 14	106	2.1	5	0.9	8	2.8	3	0.7
15 to 24	355	7.1	33	6.0	39	13.7	6	1.3
25 to 34	356	7.1	49	8.9	41	14.4	8	1.8
35 to 44	312	6.2	52	9.5	16	5.6	6	1.3
45 to 64	956	19.1	150	27.3	32	11.2	31	6.9
65 to 74	594	11.8	48	8.7	34	11.9	25	5.6
75 and older	552	11.0	64	11.7	21	7.4	22	4.9
Total	**5015**	**-**	**549***	**-**	**285**	**-**	**447**	**-**

*417 influenza A(H1), 10 influenza A(H3), 122 not further typed

Thirty-six per-cent of all the symptomatic patients in hospitals who were tested for seasonal respiratory pathogens between 28 September 2015 and 22 May 2016 were younger than ten years and 19% were aged 45 to 64 years (Table 2.2.2), the median age of patients tested was 32 years.

Out of all the patients testing positive for influenza A, 27% were aged 45 to 64 years and 27% were younger than ten years, the median patient age was 42 years. The median age of patients testing positive for influenza B was 25 years, with patients aged up to ten years accounting for 33% of all influenza B positive samples and patients aged 25 to 34 years accounting for 14%. The median age of patients testing positive for RSV was 0.8 years, 57% of all these patients were younger than one year of age and 17% were aged one to four years. The median age

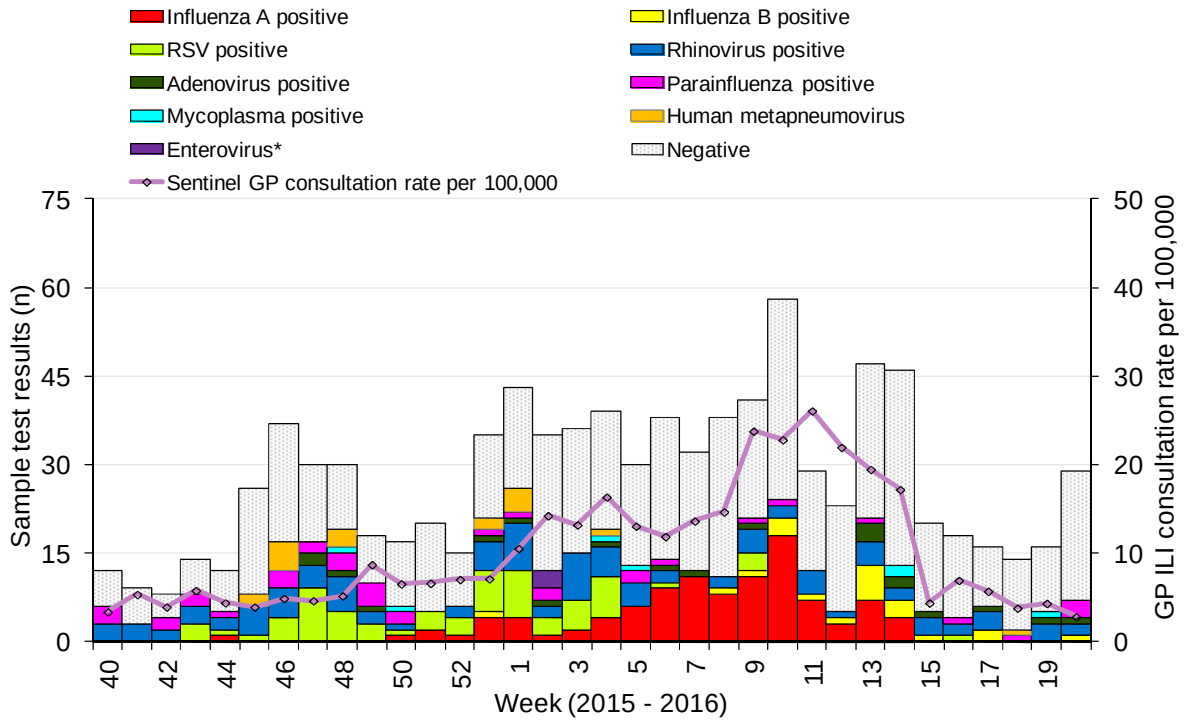
of patients testing positive for rhinovirus was 4 years; and 52% of the patients testing positive were younger than five years of age. The median ages of patients testing positive for human metapneumovirus and *Mycoplasma pneumoniae* were 19 years and 23 years respectively.

2.4 Hospital indicators - patients in intensive care units

During the period 2015 week 40 to 2016 week 20 (September 28th 2015 to May 22nd 2016) there were 887 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. From 2016 week 4 respiratory samples from ICU patients were also tested for enteroviruses

Of the 887 samples tested 14% (n=125) were positive for influenza, 12% (n=104) were positive for rhinovirus and 8% (n=68) were positive for RSV. Sixty two percent (n=552) were negative for all organisms.

Figure 2.4.1. *Results from respiratory tests carried out on samples from patients in intensive care units in Wales by Week, 2015-2016.*



Influenza A was first detected in samples from patients in ICU in 2015 week 44. From 2015 week 50 (week ending 13th December) influenza A virus was detected each week, peaking in week 10 (n=18) (Figure 2.4.1). Lower numbers of influenza B positive samples from patients in ICU were seen later in the season. Of the 76 influenza A samples that were further typed 99% (n=75) were influenza A(H1) and 1% (n=1) were influenza A(H3).

Table 2.4.1. *Samples from patients in ICU/HDU testing positive for influenza A, influenza B and RSV between 2015 week 40 and 2016 week 20 by age group*

Age Group	Samples tested		Influenza A		Influenza B		RSV	
	n	%	n	%	n	%	n	%
Under 1	203	22.9	7	6.7	0	0.0	42	61.8
1 to 4	46	5.2	1	1.0	0	0.0	7	10.3
5 to 9	16	1.8	2	1.9	0	0.0	1	1.5
10 to 14	3	0.3	0	0.0	1	4.8	0	0.0
15 to 24	25	2.8	3	2.9	3	14.3	0	0.0
25 to 34	36	4.1	6	5.8	3	14.3	0	0.0
35 to 44	57	6.4	11	10.6	3	14.3	1	1.5
45 to 64	224	25.3	45	43.3	2	9.5	8	11.8
65 to 74	152	17.1	14	13.5	8	38.1	3	4.4
75 and old	125	14.1	15	14.4	1	4.8	6	8.8
Total	**887**	**-**	**104***	**-**	**21**	**-**	**68**	**-**

*75 influenza A(H1), 1 influenza A(H3), 28 not further typed

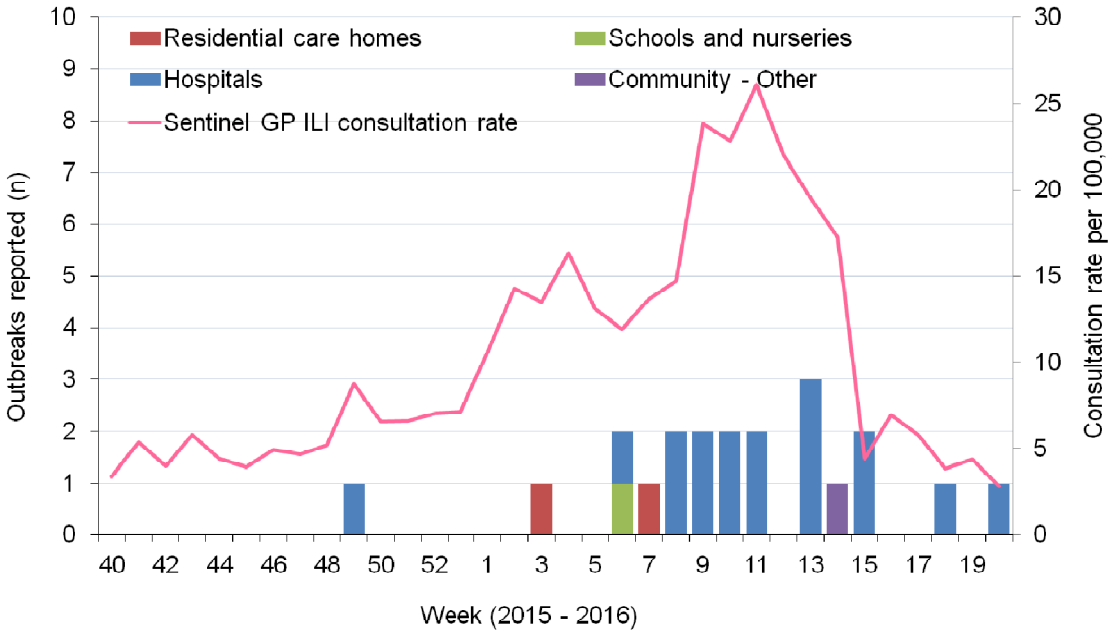
Twenty five percent of all the patients in ICU who were tested for seasonal respiratory pathogens between September 28th 2015 and May 22nd 2016 were aged 45 to 64 years and 23% were under 1 year of age (Table 2.4.1), the median age of patients tested was 51 years.

Out of all the patients testing positive for influenza A, 43% were aged 45 to 64 years, the median patient age was 58 years. The median age of patients testing positive for influenza B was also 58 years, with patients aged 65 to 74 years accounting for 38% of all cases. The median age of patients testing positive for RSV was 0.6 years, 62% of all these patients were younger than one year of age.

2.5 outbreaks of influenza, ILI or acute respiratory infection

During the 2015/16 influenza season in Wales there were 21 outbreaks of acute respiratory illness (ARI) reported to Public Health Wales Health Protection Teams (Figure 2.5.1). Influenza was laboratory confirmed in 13 of these outbreaks and human metapneumovirus was confirmed in one. Of the thirteen outbreaks due to laboratory confirmed influenza information on influenza type was available for nine. Four were due to influenza A, four were due to influenza B and in one outbreak both influenza A and influenza B were detected. Seventeen (81%) of the ARI outbreaks were reported from hospital wards, two (10%) were reported from residential care homes, one was reported from a nursery and one from an army barracks. Twelve (57%) of the ARI outbreaks reports occurred in Mid and West Wales (covering Abertawe Bro Morgannwg University Health Board, Hywel Dda University Health Board and Powys Teaching Health Board), eight (38%) of the outbreaks were reported from South or South East Wales (covering Cardiff and Vale University Health Board, Cwm Taf University Health Board and Aneurin Bevan University Health Board) and one of the outbreaks was reported from North Wales (covering Betsi Cadwaladr University Health Board). Outbreaks occurred between 2015 week 49 to 2016 week 20.

Figure 2.5.1. *Outbreaks of acute respiratory illness reported to Public Health Wales Health Protection Team during the 2015/16 season from community settings. The sentinel GP ILI consultation rate per 100,000 is also included.*



2.6 Excess mortality during the influenza season

Weekly monitoring of seasonal excesses in mortality is carried out at an England and Wales level during the winter period by Public Health England [4]. The expected number of weekly death registrations for any given week are calculated using Serfling regression and estimated numbers of all-cause registered deaths provided by the Office of National Statistics [6]. This is compared to the actual number of registered deaths for the same week to determine whether mortality is different than expected, resulting in excess all-cause mortality.

During the 2015/16 winter period in Wales, all-cause mortality exceded the upper limit expected during 7 weeks with the largest peak seen in week 2 of 2016. A total of 2,291 excess all-age deaths were estimated by Public Health England to have occurred in England and Wales during 2015/16; a much smaller number compared to 2014/15 when 16,415 excess all-age deaths were estimated.

3. Influenza virus characterisation, vaccine effectiveness and antivirals

3.1 Laboratory characterisation of influenza viruses

The 2015/16 flu season in the UK was dominated by influenza A(H1N1)pdm09 and influenza B viruses. Genetic characterisation of influenza viruses from patient samples is carried out by Public Health England, Health Protection Scotland and Public Health Wales. In addition Public Health England carries out antigenic characterisation of influenza viruses isolated from patient samples.

From genetic characterisation data, the dominant types of influenza A(H1N1)pdm09 viruses circulating in the UK were from the genetic subgroup 6B, although there was some heterogeneity observed. Of the 41 influenza A (H1N1pdm09) viruses genetically characterised in Wales by partial sequencing of the HA gene, 39 viruses were characterised as belonging to subgroup 6B.1. This reflects the findings of the other UK nations in that 6B.1 H1N1 viruses circulated widely. Viruses in North Wales were detected later in the season and four of these nine viruses sequenced belonged to the emerging subgroup 6B.2 (appendix figure B1). Genetic characterisation of the NA gene showed that they belonged to the genetic subgroup of 6B, no viruses sequenced were shown to carry markers for resistance to the neuraminidase inhibitors.

Of the 871 influenza A(H1N1)pdm09 viruses antigenically characterised by Public Health England during this season, the majority were similar to the A/California/7/2009 strain contained in the 2015/16 Northern Hemisphere trivalent and quadrivalent vaccines.

Influenza A(H3N2) circulated in lower numbers during 2015/16. The majority of viruses genetically characterised were from the 3C.2a subgroup, which was dominant in 2014/15. Of the eight influenza A(H3N2) viruses antigenically characterised by Public Health England, all were similar to the A/Switzerland/9715293/2013 strain contained in the 2015/16 Northern Hemisphere trivalent and quadrivalent vaccines.

The majority of influenza B viruses which circulated during 2015/16 in the UK belonged to the Victoria lineage. Early influenza B viruses detected in Wales belonged to the Yamagata lineage, however during the main peak of the influenza B season only influenza B Victoria lineage lineage were detected. Viruses of the Victoria lineage were not included in the 2015/16 Northern Hemisphere trivalent vaccine, but were contained in the 2015/16 Northern Hemisphere quadrivalent vaccine.

3.2 Effectiveness of the 2015/16 seasonal influenza vaccine in the UK

In 2015/16, influenza vaccine effectiveness (VE) was measured against GP-attended laboratory confirmed influenza using a test-negative case-control study design, which included data collected through five primary care influenza sentinel swabbing surveillance schemes from England (two schemes), Scotland, Wales and Northern Ireland. The overall adjusted effectiveness of the 2015/16 Northern Hemisphere vaccines was estimated at 52.4% (95%CI 41 to 61.6) [7]. Effectiveness was highest in patients aged two to 17 years (57.6%) who received quadrivalent LAIV and lowest in patients aged 65 years and older (29.1%)

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, per 100,000 practice population, peaked at 1.1 during week 10 2016 (week ending March 13th, Figure3.3.1), which was one week before the peak for ILI consultations in sentinel practices. The peak in prescribing rate

during 2015/16 was lower than the 2014/15 peak prescribing rate in Wales (Table 3.3.1). During the 2015/16 season in the UK, most viruses were fully susceptible and only small numbers of viruses were detected with reduced sensitivity to oseltamivir or zanamivir [4].

Figure 3.3.1. *Prescribing rate for oseltamivir per 100,000 practice population in Wales from week 40 2014 to week 20 2016 (arrows indicate when antiviral licensing triggers were issued, in line with NICE guidance).*

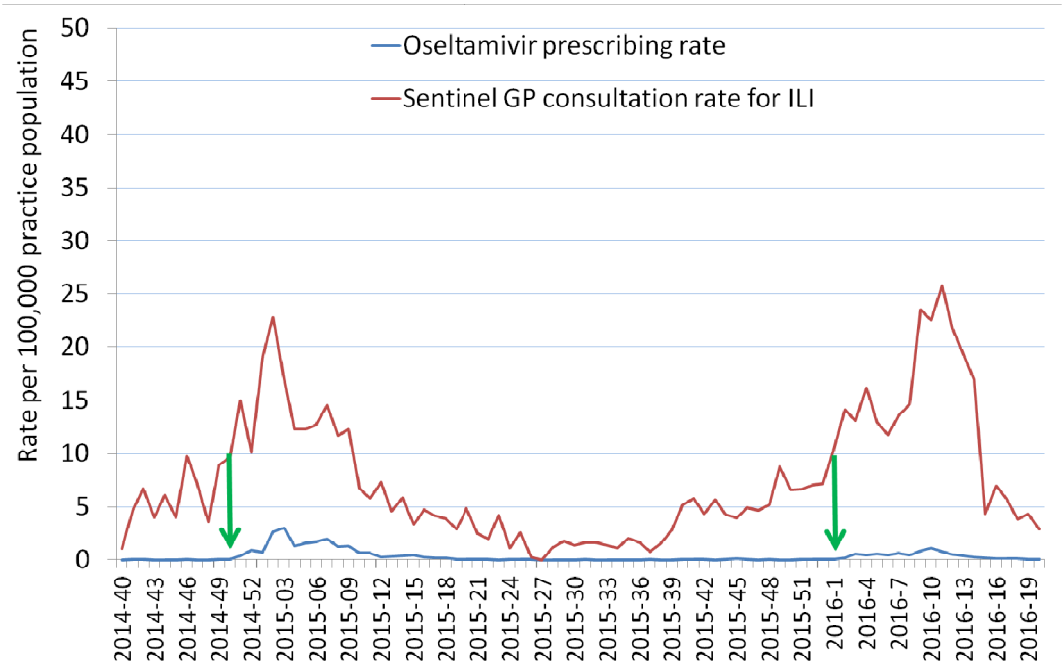


Table 3.3.1. *Peak sentinel GP consultation rates for ILI per 100,000 practice population and peak all Wales prescribing rates per 100,000 for influenza seasons from 2010/11 to 2015/16*

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

[1] Rates are per 100,000 practice population

4. Influenza immunisation in Wales 2015/16

4.1 Data collection

4.1.1 Primary Care data

Data on influenza immunisation for the 2015/16 campaign were collected directly from GPs 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 2015 and April 2016 (this report is mainly based on data submitted by 18th April 2016).

On a weekly basis throughout 2015/16 data were received from approximately 80% of 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 451 (99.8%) out of 452 practices automatically through Audit+. Data could not be collected from the remaining practice, which ceased operating late in the flu season.

Data were collected on immunisations given to those aged 65 years and older (defined as aged at least 65 years on 31 March 2016), those aged between six months and 64 years recorded as belonging to one or more clinical risk category (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 2015 to January 2016 who had received an influenza vaccine since 1 September 2016. Immunisation uptake data for patients with morbid obesity who were not otherwise at risk were not included in the general measure for patients aged six months to 64 years, but were collected and reported separately. 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 2015/16 [8].

4.1.2 Point of delivery survey data of coverage in pregnant women

During January 2016 Public Health Wales Vaccine Preventable Disease Programme and the Heads of Midwifery and midwife colleagues in all Welsh health boards conducted a survey 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 in April 2016 [9]. During the five day period information was collected from 427 women giving birth across Wales.

4.1.3 Reception class, year 1 and year 2 schoolchildren (aged four to six years) immunisation data

Data on uptake of LAIV in schoolchildren in reception class, year 1 and year 2 age groups were manually submitted by health board Immunisation Coordinators on a fortnightly basis throughout the campaign. Uptake figures represent the proportion of children in full time education that received the LAIV at a school immunisation session. Children in this age group 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 2015 to March 2016 by health board occupational health departments. Denominator data were sourced at the start of the campaign, from health boards using Electronic Staff Record (ESR) staff groupings. 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 by Public Health Wales, in April 2016. 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 99.8% of general practices in Wales (Tables A1 and A2).

Uptake in those aged 65 years and over was 66.6%, a decrease of 1.4 from 68.0% in the 2014/15 season. (Figure 4.2.1). This is below the Welsh Government target of 75%. Ninety per-cent of immunisations given to those 65 years and over were delivered by the week ending 29th November 2015 (Figure 4.2.2). Uptake varied by health board from 63.9% (Hywel Dda UHB) to 68.9% (Cardiff and Vale UHB, Table 4.2.1, Figures 4.2.3 and 4.2.5) and ranged by Local Authority (LA) area from 59.7% (Ceredigion) to 72.2% (Wrexham) (Appendix Table A1). No health board areas or LA areas achieved the 75% target.

Uptake in those aged six months to 64 years and in a clinical risk group was 46.9%. This is a decrease of 2.4 from 49.3% in the 2014/15 season (Figure 4.2.1). Ninety per-cent of immunisations given to those aged six months to 64 years in clinical risk groups were delivered by week ending 03 February 2015 (Figure 4.2.2). Uptake ranged by health board from 43.2% (Hywel Dda UHB) to 49.4% (Aneurin Bevan UHB), (Table 4.2.1, Figures 4.2.4 and 4.3.6) and by LA area from 41.3% (Ceredigion) to 53.6% (Wrexham) (Appendix Table A1). The proportion of all patients aged six months to 64 years recorded in one or more clinical risk categories was 14.3% (an increase from 13.9% recorded in 2014/15). Of those aged six months to 64 years in clinical risk groups, 11.4% were recorded as having declined immunisation in general practice databases, compared to 10.9% in the 2014/15 season. For patients aged 65 years or older, 15.4% were recorded as having declined immunisation, compared to 12.0% in the 2014/15 season. These figures are based on a 99.8% practice report rate through Audit+.

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, 2008/09 – 2015/16.*

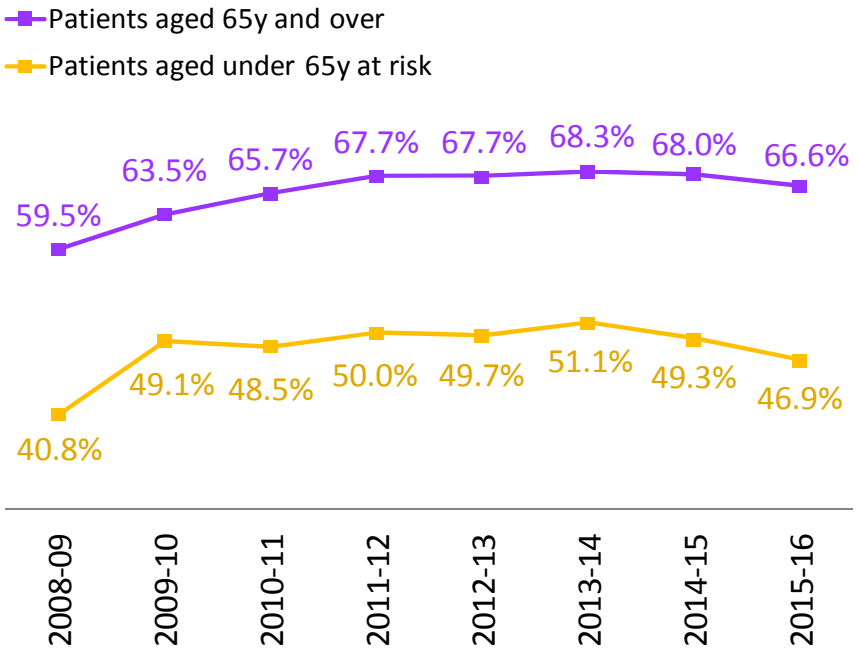


Figure 4.2.2. *Uptake of influenza vaccine in patients aged 65 years and over and in those aged six months to 64 years in clinical risk groups, Wales, 2015 - 2016.*

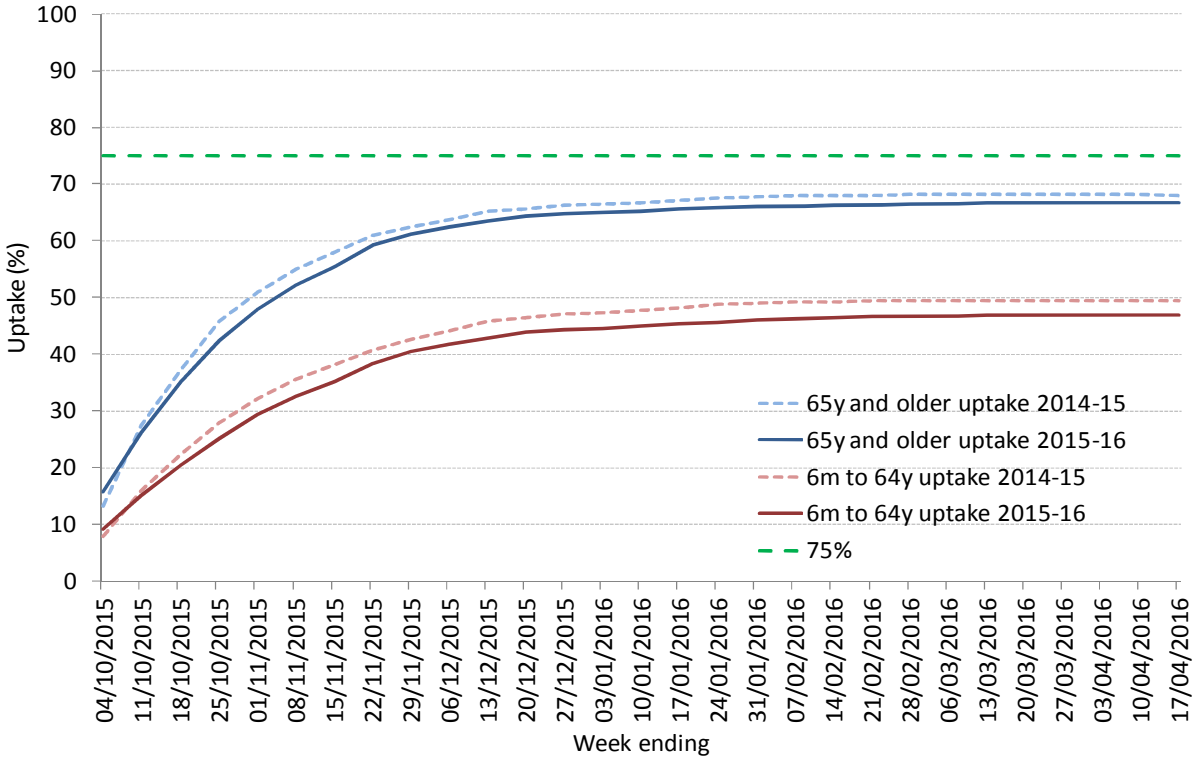


Table 4.2.1. *Trends in uptake of influenza immunisation in health boards, Wales, 2012/13 to 2015/16.*

Health Board	Uptake in patients aged 65y and older (%)				Uptake in patients younger than 65y at risk (%)			
	2012/13	2013/14	2014/15	2015/16	2012/13	2013/14	2014/15	2015/16
Abertawe Bro Morgannwg	65.4	65.6	65.0	64.6	45.2	45.3	44.0	43.4
Aneurin Bevan	68.4	70.4	70.0	67.7	50.3	55.3	52.9	49.4
Betsi Cadwaladr	70.0	70.7	70.1	68.7	52.1	53.5	51.4	49.3
Cardiff and Vale	69.3	69.7	70.0	68.9	51.5	52.7	50.4	48.3
Cwm Taf	65.9	66.3	67.5	65.0	51.0	51.4	49.8	45.9
Hywel Dda	65.4	65.5	64.9	63.9	48.0	47.5	46.2	43.2
Powys Teaching	67.7	67.0	66.5	64.3	49.3	49.5	47.8	44.2
Wales total	**67.7**	**68.3**	**68.0**	**66.6**	**49.7**	**51.1**	**49.3**	**46.9**

Table 4.2.2. *Trends in general practices submitting influenza immunisation uptake data in health boards, Wales, 2012/13 to 2015/16.*

Health Board	Practices submitting data (%)			
	2012/13	2013/14	2014/15	2015/16
Abertawe Bro Morgannwg	98.7	97.4	100.0	100.0
Aneurin Bevan	100.0	91.0	100.0	100.0
Betsi Cadwaladr	100.0	91.4	100.0	99.1
Cardiff and Vale	100.0	98.5	100.0	100.0
Cwm Taf	100.0	100.0	100.0	100.0
Hywel Dda	100.0	98.2	100.0	100.0
Powys Teaching	100.0	94.1	100.0	100.0
Wales total	**99.8**	**95.1**	**100.0**	**99.8**

Figure 4.2.3. *Uptake of influenza immunisation in general practices during 2015/16, by health board, in: (a) patients aged 65 years and over and (b) patients aged six months to 64 years in clinical risk groups.*

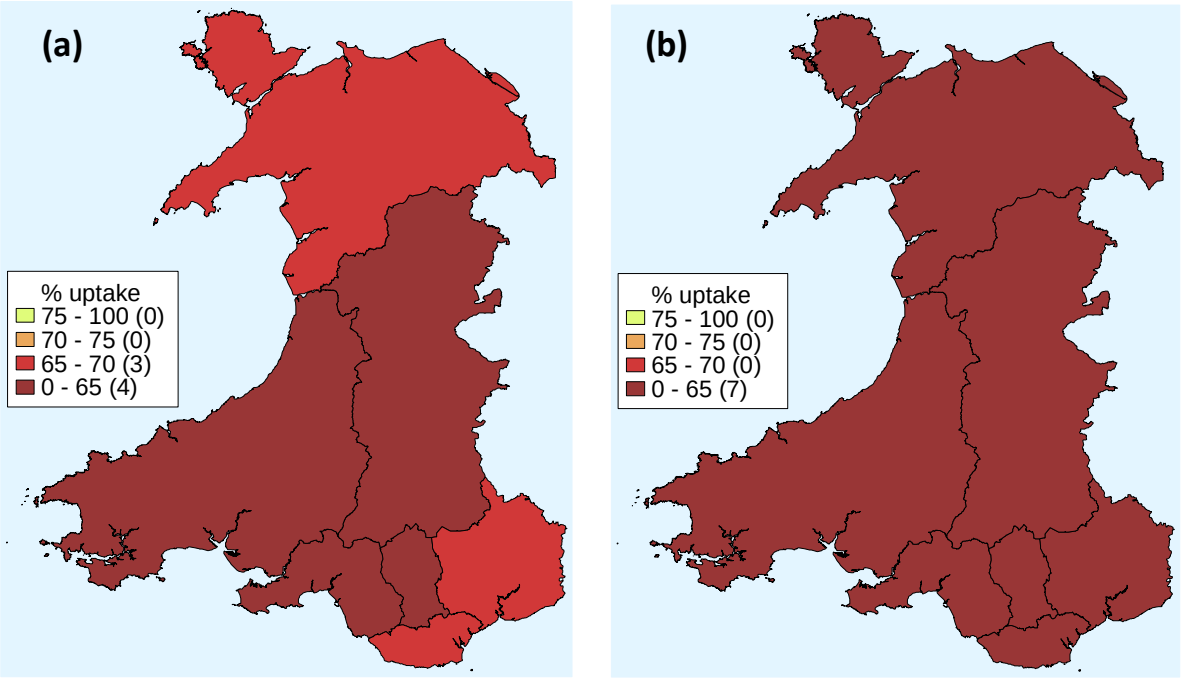


Figure 4.2.4. *Uptake of influenza immunisation in general practices during 2015/16, by Local Authority of practice location, in: (a) patients aged 65 years and over and (b) patients aged six months to 64 years in clinical risk groups.*

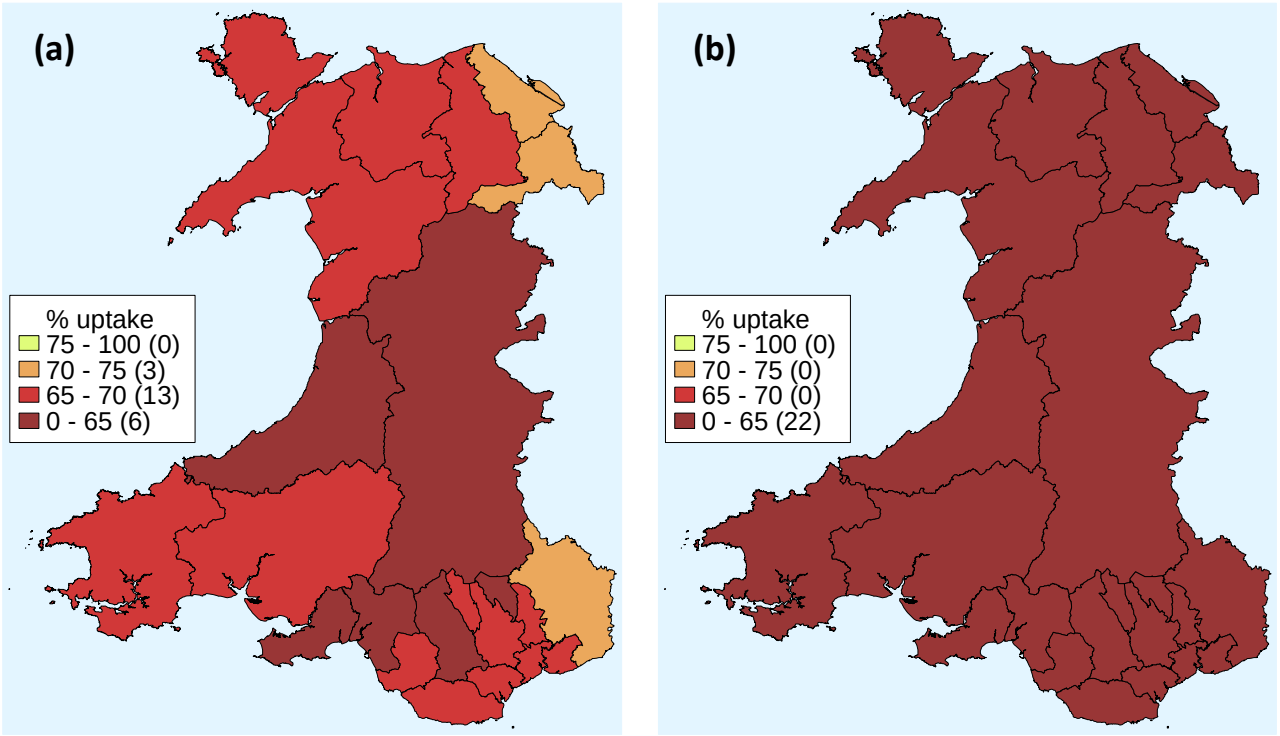


Figure 4.2.5. *Uptake of influenza immunisation in health boards in Wales in patients aged 65 years and over, 2012/13 – 2015/16 ranked by uptake in 2015/16.*

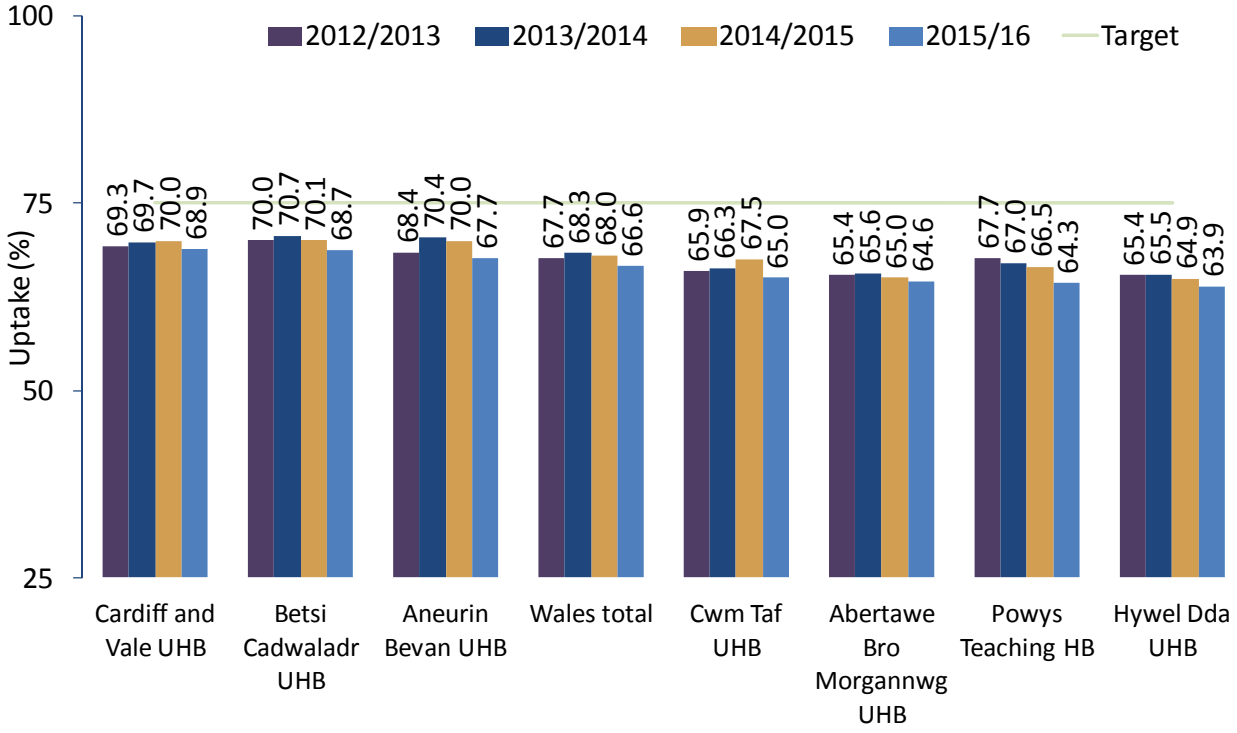
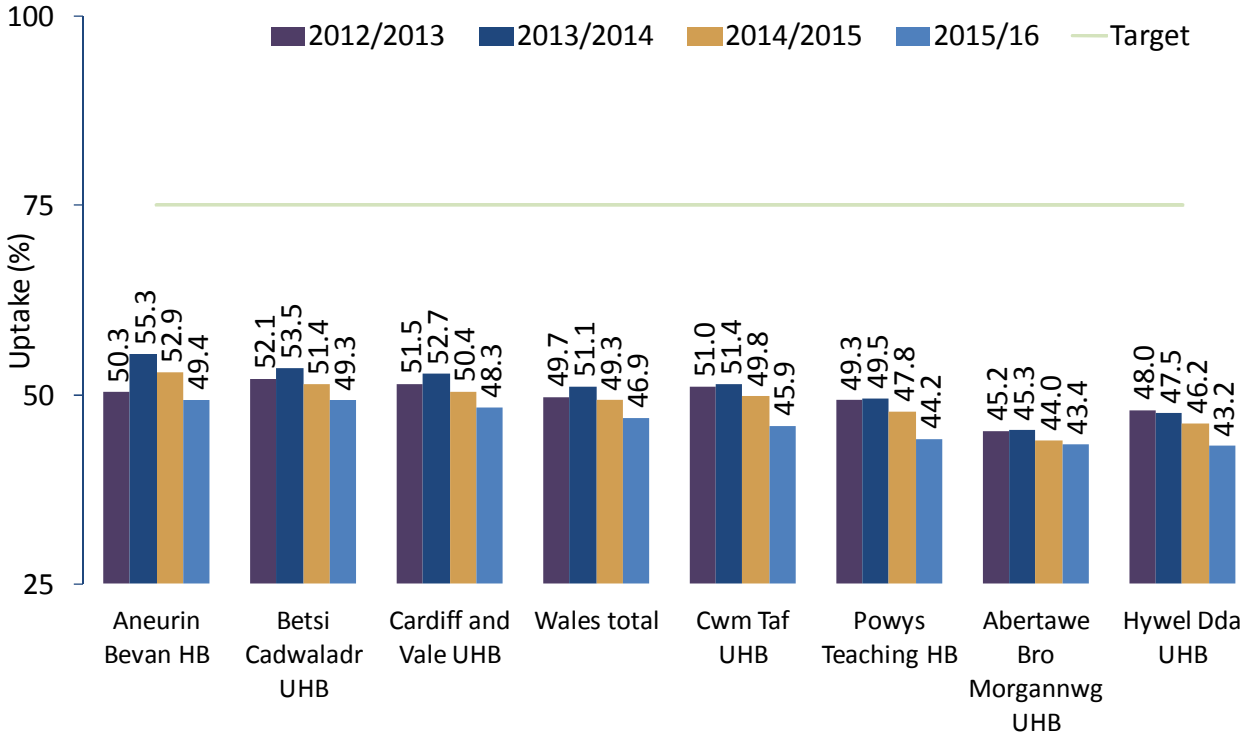
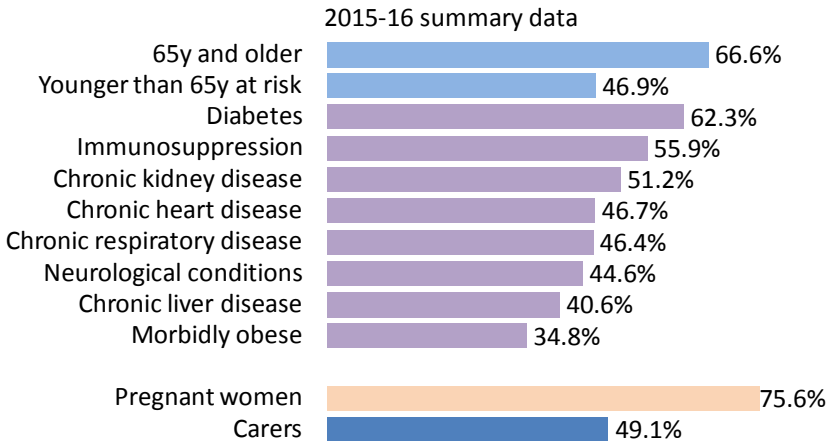


Figure 4.2.6. *Uptake of influenza immunisation in health boards in Wales in patients aged six months to 64 years in clinical risk groups, 2012/13 – 2015/16 ranked by uptake in 2015/16.*



4.2.2 Immunisation uptake by risk group

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, 2015/16.*



- Chronic heart disease or a related condition was recorded in 2.4% 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 41.0% (Powys Teaching HB) to 50.7% (Betsi Cadwaladr UHB).
- Chronic respiratory disease was recorded in 7.4% of patients aged six months to 64 years, of whom 46.4% were immunised against influenza (Figure 4.2.7 Appendix Table A2), ranging by health board from 41.9% (Hywel Dda UHB) to 49.0% (Aneurin Bevan UHB).
- Chronic kidney disease was recorded in 0.6% of patients aged six months to 64 years, of whom 51.2% were immunised against influenza (Figure 4.2.7 Appendix Table A2), ranging by health board from 47.0% (Abertawe Bro Morgannwg UHB) to 55.2% (Aneurin Bevan UHB).
- Diabetes was recorded in 3.2% of patients aged six months to 64 years, of whom 62.3% were immunised against influenza (Figure 4.2.7 Appendix Table A2), ranging by health board from 57.7% (Hywel Dda UHB) to 67.0% (Cardiff and Vale UHB).
- Immunosuppression due to disease or treatment was recorded in 0.8% of patients aged six months to 64 years, of whom 55.9% were immunised against influenza (Figure 4.2.7 Appendix Table A2), ranging by health board from 47.8% (Abertawe Bro Morgannwg UHB) to 60.1% (Betsi Cadwaladr UHB).
- Chronic liver disease was recorded in 0.3% of patients aged six months to 64 years, of whom 40.6% were immunised against influenza (Figure 4.2.7 Appendix Table A2), ranging by health board from 33.8% (Cwm Taf UHB) to 44.2% (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 44.6% were immunised against influenza (Figure 4.2.7 Appendix Table A2), ranging by health board from 40.7% (Powys Teaching HB) to 48.1% (Betsi Cadwaladr UHB).
- In total, there were 8,107 people aged six months to 64 years recorded as being morbidly obese who are not in any of the other clinical risk groups, of whom 34.8% were immunised against influenza (Figure 4.2.7 Appendix Table A2). Uptake ranged by health board from 30.4% (Hywel Dda UHB) to 39.7% (Betsi Cadwaladr UHB,).
- In total, there were 26,986 people aged six months to 64 years recorded as being a carer (including carers who are also in a clinical risk group), of whom 49.1% were immunised against influenza (Figure 4.2.7 Appendix Table A2). 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 45.7% (Hywel Dda UHB) to 52.1% (Cwm Taf UHB).

4.2.3 Estimated numbers of individuals immunised in Wales in 2015/16

The total number of individuals recorded (with Read codes) as immunised against influenza in responding practices during the winter 2015/16, as at 17th April 2016, was 730,246.

This is based on data submitted by 99.8% of practices in Wales. This includes patients aged 65 years and over (423,110) and those aged six months to 64 years at clinical risk (171,162); also, pregnant women (13,655), morbidly obese patients not in any other risk group (2,822), children aged two and three years (31,766) and carers (13,258).

The remaining 74,473 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 (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, whose GPs were notified and whose records were updated with appropriate Read codes.

The estimated total of 730,246 individuals immunised in 2015/16 is an increase on the total number of individuals immunised during the 2014/15 influenza immunisation campaign, which was estimated at 723,061 individuals [10]. 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.

4.2.4 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 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 delivery 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 delivery unit.

From September 2015 to January 2016, 28,990 women were coded in general practices with Read codes associated with pregnancy. Out of these women, 3,236 (11.2%) had an existing condition within the risk groups defined by the CMO letter, the remainder (25,754) 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 47.1% and ranged by health board from 42.7% (Hywel Dda UHB) to 53.5% (Powys Teaching HB). Uptake in pregnant women with another existing risk condition was 61.1% and ranged by health board from 56.4% (Abertawe Bro Morgannwg UHB) to 68.0% (Powys Teaching HB). Uptake in pregnant women without an existing condition placing them at increased risk from influenza was 45.3%, and ranged by health board from 40.8% (Hywel Dda UHB) to 51.5% (Powys Teaching HB).

Coverage of influenza vaccination in pregnant women, at the point of delivery, was ascertained through a survey which used information from 427 women giving birth during a five day period in January and April 2016 [9]. Data

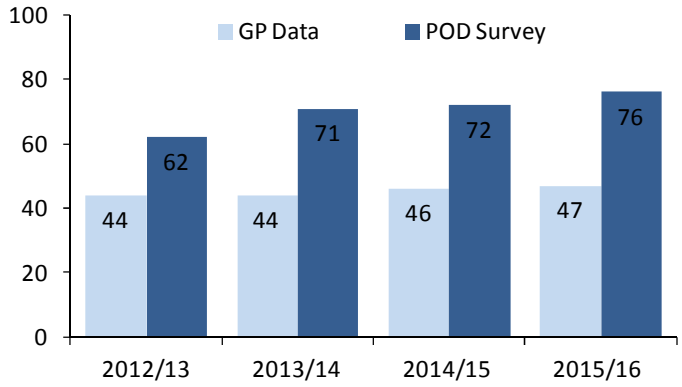
were submitted by all health boards in Wales. Uptake of influenza immunisation recalled in this group was 75.6%, an increase of 3.2% from 72.4% last year and above the 75% vaccination target set by Welsh Government. The survey also found that 95.6% of the women surveyed could recall being offered influenza immunisation, an increase of 3.3% from 92.3% last year (Table 4.2.3 and Figure 4.2.8).

Although both the point of delivery survey and Audit+ have shown an increase in uptake over the past four years in which the survey has taken place, the estimates using GP data are uniformly lower (Figure 4.2.8). The survey ascertained coverage at the point which pregnant women delivered, in January or April 2016, at 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 2015/16).*

Women offered influenza vaccination while pregnant		
	n	**%**
Yes	408	95.6
No	19	4.4
Not known/missing	0	0.0
Total	**427**	**100**

Figure 4.2.8. *Uptake of influenza vaccination in pregnant women (%), by data source, Wales, 2012/13-2015/16*



4.2.5 Uptake of Live Attenuated Intranasal Vaccine (LAIV) in children

Of a total of 71,539 children aged two and three years old, 44.4% (31,766) were immunised against influenza in general practice (Table 4.2.4). Uptake varied by health board, ranging from 33.6% (Abertawe Bro Morgannw UHB) to 51.8% (Betsi Cadwaladr UHB). Overall, uptake in two year olds (45.8%) was slightly higher compared to uptake in three year olds (43.1%).

Table 4.2.4. *Uptake of influenza immunisation in general practice in children aged two and three years by health board, Wales, 2015/16*

Health Board	Children aged 2 years			Children aged 3 years		
	Immunised (n)	Denominator (n)	Uptake (%)	Immunised (n)	Denominator (n)	Uptake (%)
Abertawe Bro Morgannwg UHB	1989	5834	34.1	2059	6211	33.2
Aneurin Bevan UHB	3332	7107	46.9	3093	7027	44.0
Betsi Cadwaladr UHB	4115	7724	53.3	3974	7901	50.3
Cardiff and Vale UHB	2750	5768	47.7	2583	6009	43.0
Cwm Taf UHB	1687	3613	46.7	1562	3716	42.0
Hywel Dda UHB	1624	3878	41.9	1776	4197	42.3
Powys Teaching HB	603	1267	47.6	619	1287	48.1
Total	**16,100**	**35,191**	**45.8**	**15,666**	**36,348**	**43.1**

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

LAIV was offered in 1,315 schools in Wales to children in reception class, year 1 and year 2. Of 106,661 eligible children aged four to six years old, 63.4% were immunised against influenza (Tables 4.2.5 and 4.2.6). Uptake ranged from 58.0% (Cardiff and Vale UHB) to 69.6% (Cwm Taf UHB).

Uptake in school reception classes, (children aged four to five years of age), was 65.6% (22,700/34,610). Uptake varied by Health Board, ranging from 59.8% (Cardiff and Vale UHB) to 74.1% (Powys THB).

Uptake in school year 1, (children aged five to six years of age), was 63.0% (21,861/34,723). Uptake varied by Health Board, ranging from 57.6% (Cardiff and Vale UHB) to 69.5% (Cwm Taf UHB).

Uptake in school year 2, (children aged six to seven years of age), was 63.7% (22,075/34,639). Uptake varied by Health Board, ranging from 56.7% (Cardiff and Vale UHB) to 74.6% (Hywel Dda UHB).

Table 4.2.5. *Uptake of influenza immunisation in school children aged four, five and six years by health board, Wales, 2015/16*

Health Board	Schools targeted (n)	Children aged 4 years			Children aged 5 years			Children aged 6 years		
		Immunised (n)	Denominator (n)	Uptake (%)	Immunised (n)	Denominator (n)	Uptake (%)	Immunised (n)	Denominator (n)	Uptake (%)
Abertawe Bro Morgannwg	190	3790	6110	62.0	3500	5907	59.3	3533	5886	60.0
Aneurin Bevan	199	4348	6769	64.2	4251	6801	62.5	4188	6764	61.9
Betsi Cadwaladr	377	5202	7765	67.0	5102	7913	64.5	5108	7732	66.1
Cwm Taf	131	2660	3790	70.2	2500	3598	69.5	2546	3676	69.3
Hywel Dda	182	2330	3147	74.0	2228	3247	68.6	2470	3312	74.6
Cardiff and Vale	154	3495	5848	59.8	3431	5955	57.6	3359	5921	56.7
Powys Teaching	82	875	1181	74.1	849	1302	65.2	871	1348	64.6
Wales	**1315**	22700	34610	**65.6**	21861	34723	**63.0**	22075	34639	**63.7**

Table 4.2.6. *Uptake of influenza immunisation in school children aged four to six years by health board, Wales, 2015/16*

Health Board	Schools targeted (n)	All children aged 4, 5 and 6 years		
		Immunised (n)	Denominator (n)	Uptake (%)
Abertawe Bro Morgannwg	190	10823	17903	60.5
Aneurin Bevan	199	12787	20334	62.9
Betsi Cadwaladr	377	15412	23410	65.8
Cwm Taf	131	7706	11064	69.6
Hywel Dda	182	8003	12395	64.6
Cardiff and Vale	154	10285	17724	58.0
Powys Teaching	82	2595	3831	67.7
Wales	**1315**	67611	106661	**63.4**

4.2.6 Uptake in Welsh health board and NHS staff

All health boards in Wales provided NHS staff immunisation uptake data for NHS staff. Uptake in staff groups that could be expected to have direct patient contact (Combined: additional Prof Scientific and Technical, Additional Clinical Services, Allied Health Professions, Medical and Dental, Nursing and Midwifery Registered staff groups) was 47.3% (Table 4.2.7). Uptake ranged by health board from 25.7% (Welsh Ambulance Service NHS Trust) to 60.1% (Powys Teaching HB). Uptake in staff groups ranged from 36.4% (Estates and Ancillary) to 61.8% (Allied Health Professions) (Table 4.2.8).

Out of 84,887 NHS health board or Trust staff under the care of health board Occupational Health departments in Wales, 39,074 (46.0%) were immunised against influenza during 2015/16, an increase of 3.1 from 42.9% recorded in the 2014/15 season and a continuation of a six year upward trend from 11.6% in 2009/10. Uptake ranged by health board from 27.6% (Welsh Ambulance Service NHS Trust) to 62.9% (Velindre NHS Trust). Six health boards or NHS Trusts showed an increase in uptake compared to the previous season (Figure 4.2.9).

In four health boards (Abertawe Bro Morgannwg UHB, Cwm Taf UHB, Hywel Dda UHB and Powys Teaching HB) and in two NHS Trusts (Public Health Wales and Velindre NHS trusts), uptake of influenza vaccination in staff with direct patient contact exceeded the Welsh Government target of 50% (Table 4.2.7).

Table 4.2.7. Uptake of influenza immunisation in NHS staff in Wales, 2015/16.

Health Board/Trust	Total Staff			Staff with direct patient contact*		
	Denominator (n)	Immunised (n)	Uptake (%)	Denominator (n)	Immunised (n)	Uptake (%)
Abertawe Bro Morgannwg UHB	15474	8055	52.1	10784	5893	54.6
Aneurin Bevan UHB	13724	5603	40.8	9509	3939	41.4
Betsi Cadwaladr UHB	16505	7191	43.6	11820	5102	43.2
Cardiff and Vale UHB	14099	6323	44.8	10109	4735	46.8
Cwm Taf UHB	7844	3786	48.3	5202	2621	50.4
Hywel Dda UHB	9901	4825	48.7	6933	3664	52.8
Powys Teaching HB	1620	902	55.7	1052	632	60.1
Public Health Wales NHS Trust	1473	812	55.1	299	171	57.2
Velindre NHS Trust	1146	721	62.9	648	385	59.4
Welsh Ambulance Service NHS Trust	3101	856	27.6	2171	559	25.7
Wales	**84887**	**39074**	**46.0**	**58527**	**27701**	**47.3**

* 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 in Wales, 2011/12 - 2015/16.

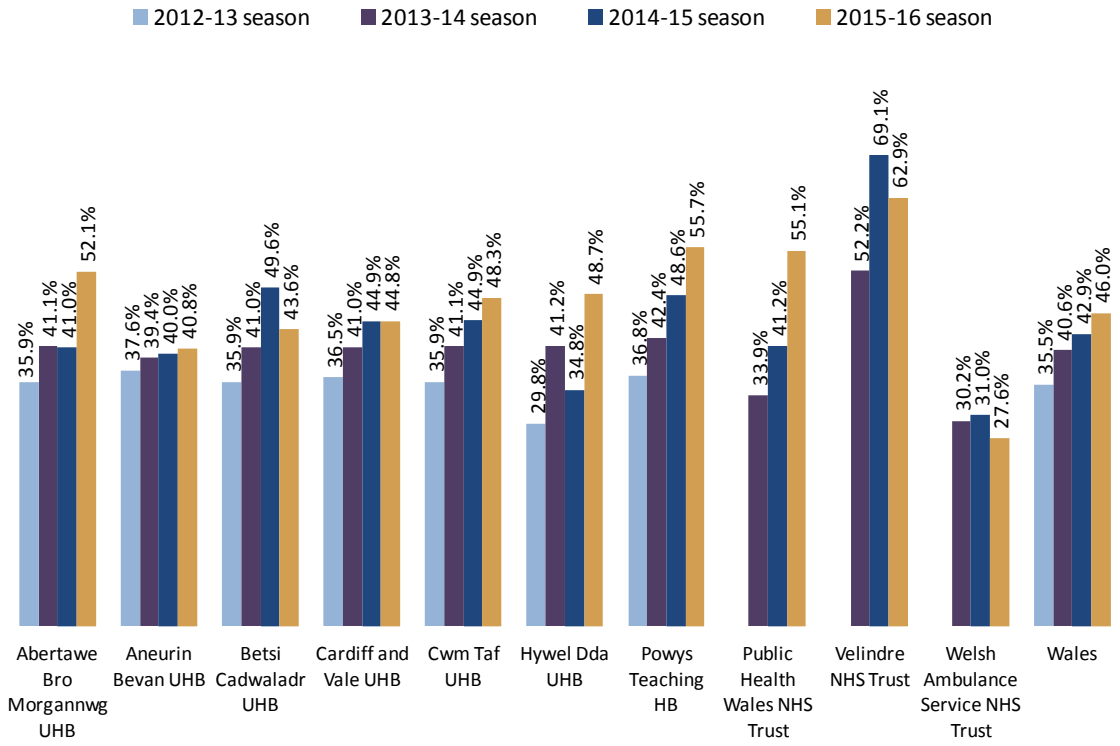


Table 4.2.8. *Uptake of influenza immunisation in NHS staff groups, Wales, 2015/16.*

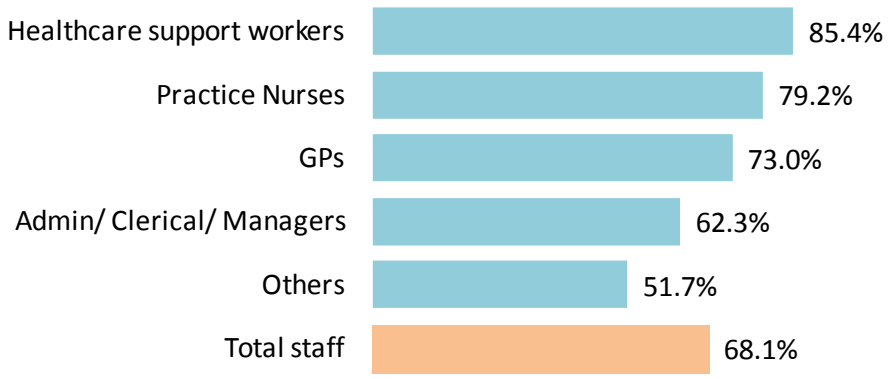
	Staff		
ESR group	Denominator (n)	Immunised (n)	Uptake (%)
Additional Clinical Services	15792	6298	39.9
Additional Prof Scientific and Technical	2980	1469	49.3
Administrative and Clerical	13914	6637	47.7
Allied Health Professionals	4914	3037	61.8
Estates and Ancillary	8507	3097	36.4
Healthcare Scientists	1835	701	38.2
Medical and Dental	7162	3546	49.5
Nursing & Midwifery Registered	25249	12655	50.1
Wales uptake	**84887**	**39074**	**46.0**

4.2.7 Uptake in general practice staff

In April 2016, 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 21.4% out of 449 practices in Wales, varying by health board from 11.8% to 26.1%.

Uptake of influenza immunisation in general practice ranged by staff group from 51.7% (others) to 85.4% (healthcare support workers) (Figure 4.2.10). Overall uptake in staff from responding practices was 68.1%. In responding practices, 26.8% 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 - 2015/16 (based on information from 21.4% of general practices in Wales).*



5. Conclusions

The 2015/16 season was later than recent influenza seasons and longer in duration. Consultation rates for GP diagnosed ILI crossed the baseline MEM threshold at the start of January, but did not peak until late in March. Influenza cases during the 2015/16 influenza season tended to be younger than those seen during the 2014/15 season.

During the 2015/16 influenza season there were higher numbers of cases of influenza-like illness diagnosed in general practice and cases of influenza confirmed in hospitals and in ICU/ HDU, compared with the previous year. However, the level of excess seasonal mortality seen was far lower than in 2014/15.

The higher number of patients diagnosed with influenza, or confirmed through laboratory testing, may be due to the longer duration of 2015/16 season which saw co-circulation of influenza A(H1N1)pdm09 and influenza B viruses. The lower seasonal excess mortality seen during 2015/16 is likely due to a combination of factors, including that influenza A(H3N2) dominated in 2014/15, which tends to affect the elderly more severely and that the dominant strain of this virus in 2014/15 was not a good match for the 2014/15 Northern Hemisphere vaccine strain.

Although the dominant circulating strain of influenza B during 2015/16 was not included in the 2015/16 Northern Hemisphere trivalent vaccine, it was included in the quadrivalent live attenuated intranasal vaccine (which is used in the universal childhood influenza program). Considered together, 2015/16 vaccines provided significant protection against laboratory confirmed influenza in general practice patients (52%).

Once again, more vulnerable patients and eligible people in Wales received influenza vaccine this season than ever before, although this has not necessarily reflected in increased uptake in all groups due to an increase in the number of eligible individuals. Increases in uptake were seen in pregnant women and healthcare staff, while decreased uptake was observed in other patient groups. Expansion of the universal childhood influenza vaccination programme and improving influenza vaccination uptake in patients with clinical risk conditions remain a priority in minimising avoidable illness and mortality related to influenza.

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

Information for Health Professionals on influenza immunisation (NHS Wales only):
http://howis.wales.nhs.uk/sites3/page.cfm?orgid=474&pid=54871

Information on influenza:
http://www.wales.nhs.uk/sites3/page.cfm?orgId=457&pid=27522

General information on influenza immunisation in Wales:
http://www.wales.nhs.uk/sites3/page.cfm?orgid=457&pid=25480

Influenza surveillance in Wales:
http://www.wales.nhs.uk/sites3/page.cfm?orgid=457&pid=27922

7. Information about this report

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Acknowledgments
Primary Care data for this report were provided through the Audit+ Data Quality System and the authors are grateful to the NHS Wales Informatics Service Primary Care Informatics Team for their help in collecting relevant data. The authors would like to thank the Public Health Wales Health Protection Team and Public Health Wales Microbiology for contributing information to this report.

The authors would also like to thank Primary Care staff and health board Immunisation Coordinators, Midwifery and School Nursing services and their teams in ensuring data submission and monitoring data quality.

NHS staff immunisation data was provided by health board Occupational Health departments.

Suggested citation
Public Health Wales Vaccine Preventable Disease Programme and Communicable Disease Surveillance Centre. Seasonal Influenza in Wales - 2015/16, August 2016. Cardiff: Public Health Wales.

8. Appendix A: Influenza Immunisation Data Tables

Table A1. Uptake of influenza immunisation in Wales 2015/16.

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	19,871	29,510	67.3	7,982	18,117	44.1	18	18	100.0
Neath Port Talbot LA	18,091	28,362	63.8	7,721	17,171	45.0	21	21	100.0
Swansea LA	30,775	48,581	63.3	12,001	28,581	42.0	34	34	100.0
Health Board Total	**68,737**	**106,453**	**64.6**	**27,704**	**63,869**	**43.4**	**73**	**73**	**100.0**
Aneurin Bevan UHB									
Blaenau Gwent LA	9,113	14,307	63.7	4,540	9,438	48.1	13	13	100.0
Caerphilly LA	22,630	34,468	65.7	10,525	22,114	47.6	25	25	100.0
Monmouthshire LA	16,859	23,532	71.6	5,812	11,038	52.7	14	14	100.0
Newport LA	18,125	26,303	68.9	8,842	17,067	51.8	20	20	100.0
Torfaen LA	12,499	18,432	67.8	5,752	12,124	47.4	13	13	100.0
Health Board Total	**79,226**	**117,042**	**67.7**	**35,471**	**71,781**	**49.4**	**85**	**85**	**100.0**
Betsi Cadwaladr UHB									
Anglesey LA	10,992	16,017	68.6	3,975	8,148	48.8	11	11	100.0
Conwy LA	20,069	29,914	67.1	6,076	12,863	47.2	19	19	100.0
Denbighshire LA	15,299	22,981	66.6	5,572	11,993	46.5	15	16	93.8
Flintshire LA	21,494	30,284	71.0	8,876	17,388	51.0	22	22	100.0
Gwynedd LA	17,864	26,946	66.3	6,337	13,525	46.9	23	23	100.0
Wrexham LA	20,091	27,810	72.2	8,942	16,688	53.6	21	21	100.0
Health Board Total	**105,809**	**153,952**	**68.7**	**39,778**	**80,605**	**49.3**	**111**	**112**	**99.1**
Cardiff and Vale UHB									
Cardiff LA	33,897	49,642	68.3	19,134	39,226	48.8	50	50	100.0
Vale of Glamorgan LA	17,581	25,107	70.0	6,557	14,012	46.8	16	16	100.0
Health Board Total	**51,478**	**74,749**	**68.9**	**25,691**	**53,238**	**48.3**	**66**	**66**	**100.0**
Cwm Taf UHB									
Merthyr Tydfil LA	7,802	11,858	65.8	3,674	7,830	46.9	10	10	100.0
Rhondda Cynon Taff LA	30,018	46,359	64.8	13,263	29,041	45.7	35	35	100.0
Health Board Total	**37,820**	**58,217**	**65.0**	**16,937**	**36,871**	**45.9**	**45**	**45**	**100.0**
Hywel Dda UHB									
Carmarthenshire LA	25,950	39,723	65.3	8,830	20,314	43.5	25	25	100.0
Ceredigion LA	12,918	21,647	59.7	3,887	9,412	41.3	14	14	100.0
Pembrokeshire LA	18,586	28,516	65.2	6,170	13,955	44.2	15	15	100.0
Health Board Total	**57,454**	**89,886**	**63.9**	**18,887**	**43,681**	**43.2**	**54**	**54**	**100.0**
Powys Teaching HB	22,586	35,114	64.3	6,694	15,043	44.5	17	17	100.0
Wales Total	**423,110**	**635,413**	**66.6**	**171,162**	**365,088**	**46.9**	**451**	**452**	**99.8**

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 2015/16**.**

Local Authority	Total patients aged 6m to 64y	Chronic heart disease				Chronic respiratory disease				Chronic kidney disease				Diabetes			
		With condition		Immunised	Uptake	With condition		Immunised	Uptake	With condition		Immunised	Uptake	With condition		Immunised	Uptake
		(n)	(%)	(n)	(%)	(n)	(%)	(n)	(%)	(n)	(%)	(n)	(%)	(n)	(%)	(n)	(%)
Abertawe Bro Morgannwg UHB																	
Bridgend LA	120,125	3,527	2.9	1,586	45.0	9,110	7.6	3,953	43.4	928	0.8	452	48.7	4,261	3.5	2,532	59.4
Neath Port Talbot LA	109,741	3,061	2.8	1,377	45.0	8,785	8.0	3,909	44.5	1,169	1.1	561	48.0	4,171	3.8	2,506	60.1
Swansea LA	205,640	4,884	2.4	2,030	41.6	14,877	7.2	6,190	41.6	1,044	0.5	462	44.3	6,440	3.1	3,704	57.5
Health Board Total	**435,506**	**11,472**	**2.6**	**4,993**	**43.5**	**32,772**	**7.5**	**14,052**	**42.9**	**3,141**	**0.7**	**1,475**	**47.0**	**14,872**	**3.4**	**8,742**	**58.8**
Aneurin Bevan UHB																	
Blaenau Gwent LA	59,672	1,619	2.7	796	49.2	4,731	7.9	2,304	48.7	453	0.8	228	50.3	2,416	4.0	1,451	60.1
Caerphilly LA	151,160	3,856	2.6	1,833	47.5	11,016	7.3	5,162	46.9	823	0.5	427	51.9	5,728	3.8	3,668	64.0
Monmouthshire LA	77,721	1,935	2.5	996	51.5	5,624	7.2	2,939	52.3	451	0.6	276	61.2	2,378	3.1	1,579	66.4
Newport LA	127,177	2,645	2.1	1,346	50.9	8,721	6.9	4,536	52.0	653	0.5	369	56.5	4,415	3.5	2,741	62.1
Torfaen LA	75,848	2,095	2.8	1,001	47.8	6,276	8.3	2,892	46.1	394	0.5	230	58.4	2,856	3.8	1,806	63.2
Health Board Total	**491,578**	**12,150**	**2.5**	**5,972**	**49.2**	**36,368**	**7.4**	**17,833**	**49.0**	**2,774**	**0.6**	**1,530**	**55.2**	**17,793**	**3.6**	**11,245**	**63.2**
Betsi Cadwaladr UHB																	
Anglesey LA	49,415	1,175	2.4	583	49.6	4,642	9.4	2,195	47.3	342	0.7	188	55.0	1,596	3.2	1,016	63.7
Conwy LA	87,861	2,138	2.4	1,065	49.8	6,871	7.8	3,229	47.0	597	0.7	303	50.8	2,668	3.0	1,653	62.0
Denbighshire LA	76,923	2,094	2.7	1,041	49.7	6,436	8.4	2,938	45.6	544	0.7	297	54.6	2,528	3.3	1,557	61.6
Flintshire LA	120,566	2,848	2.4	1,479	51.9	9,142	7.6	4,561	49.9	763	0.6	440	57.7	3,681	3.1	2,432	66.1
Gwynedd LA	98,111	1,984	2.0	957	48.2	7,459	7.6	3,408	45.7	647	0.7	306	47.3	2,595	2.6	1,613	62.2
Wrexham LA	118,006	2,880	2.4	1,524	52.9	8,945	7.6	4,750	53.1	793	0.7	489	61.7	3,572	3.0	2,425	67.9
Health Board Total	**550,882**	**13,119**	**2.4**	**6,649**	**50.7**	**43,495**	**7.9**	**21,081**	**48.5**	**3,686**	**0.7**	**2,023**	**54.9**	**16,640**	**3.0**	**10,696**	**64.3**
Cardiff and Vale UHB																	
Cardiff LA	320,963	5,980	1.9	2,779	46.5	20,906	6.5	10,111	48.4	1,266	0.4	675	53.3	8,662	2.7	5,904	68.2
Vale of Glamorgan LA	101,050	2,383	2.4	1,126	47.3	7,301	7.2	3,315	45.4	456	0.5	233	51.1	2,928	2.9	1,861	63.6
Health Board Total	**422,013**	**8,363**	**2.0**	**3,905**	**46.7**	**28,207**	**6.7**	**13,426**	**47.6**	**1,722**	**0.4**	**908**	**52.7**	**11,590**	**2.7**	**7,765**	**67.0**
Cwm Taf UHB																	
Merthyr Tydfil LA	53,649	1,556	2.9	705	45.3	3,915	7.3	1,900	48.5	354	0.7	158	44.6	1,949	3.6	1,222	62.7
Rhondda Cynon Taff LA	200,418	5,027	2.5	2,324	46.2	14,753	7.4	6,726	45.6	1,478	0.7	718	48.6	7,043	3.5	4,377	62.1
Health Board Total	**254,067**	**6,583**	**2.6**	**3,029**	**46.0**	**18,668**	**7.3**	**8,626**	**46.2**	**1,832**	**0.7**	**876**	**47.8**	**8,992**	**3.5**	**5,599**	**62.3**
Hywel Dda UHB																	
Carmarthenshire LA	137,648	3,573	2.6	1,596	44.7	10,341	7.5	4,360	42.2	770	0.6	369	47.9	4,730	3.4	2,714	57.4
Ceredigion LA	73,667	1,624	2.2	656	40.4	4,722	6.4	1,881	39.8	399	0.5	188	47.1	2,067	2.8	1,166	56.4
Pembrokeshire LA	89,966	2,436	2.7	1,097	45.0	7,064	7.9	3,038	43.0	603	0.7	296	49.1	3,002	3.3	1,772	59.0
Health Board Total	**301,281**	**7,633**	**2.5**	**3,349**	**43.9**	**22,127**	**7.3**	**9,279**	**41.9**	**1,772**	**0.6**	**853**	**48.1**	**9,799**	**3.3**	**5,652**	**57.7**
Powys Teaching HB	103,005	2,898	2.8	1,188	41.0	7,601	7.4	3,497	46.0	668	0.6	327	49.0	3,002	2.9	1,789	59.6
Wales Total	**2,558,332**	**62,218**	**2.4**	**29,085**	**46.7**	**189,238**	**7.4**	**87,794**	**46.4**	**15,595**	**0.6**	**7,992**	**51.2**	**82,688**	**3.2**	**51,488**	**62.3**

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 2015/16**.**

Local Authority	Total patients aged 6m to 64y	Immuno-supression				Chronic liver disease				Neurological conditions			
		With condition		Immunised	Uptake	With condition		Immunised	Uptake	With condition		Immunised	Uptake
		(n)	(%)	(n)	(%)	(n)	(%)	(n)	(%)	(n)	(%)	(n)	(%)
Abertawe Bro Morgannwg UHB													
Bridgend LA	120,125	777	0.6	369	47.5	389	0.3	147	37.8	1,823	1.5	788	43.2
Neath Port Talbot LA	109,741	787	0.7	402	51.1	388	0.4	164	42.3	1,668	1.5	739	44.3
Swansea LA	205,640	1,457	0.7	674	46.3	749	0.4	267	35.6	2,820	1.4	1,154	40.9
Health Board Total	**435,506**	**3,021**	**0.7**	**1,445**	**47.8**	**1,526**	**0.4**	**578**	**37.9**	**6,311**	**1.4**	**2,681**	**42.5**
Aneurin Bevan UHB													
Blaenau Gwent LA	59,672	624	1.0	390	62.5	243	0.4	94	38.7	916	1.5	395	43.1
Caerphilly LA	151,160	1,344	0.9	748	55.7	482	0.3	192	39.8	2,117	1.4	901	42.6
Monmouthshire LA	77,721	760	1.0	467	61.4	215	0.3	110	51.2	1,082	1.4	576	53.2
Newport LA	127,177	1,010	0.8	625	61.9	384	0.3	173	45.1	1,585	1.2	777	49.0
Torfaen LA	75,848	726	1.0	425	58.5	282	0.4	114	40.4	1,205	1.6	527	43.7
Health Board Total	**491,578**	**4,464**	**0.9**	**2,655**	**59.5**	**1,606**	**0.3**	**683**	**42.5**	**6,905**	**1.4**	**3,176**	**46.0**
Betsi Cadwaladr UHB													
Anglesey LA	49,415	592	1.2	384	64.9	176	0.4	78	44.3	760	1.5	376	49.5
Conwy LA	87,861	780	0.9	441	56.5	332	0.4	134	40.4	1,255	1.4	565	45.0
Denbighshire LA	76,923	751	1.0	419	55.8	263	0.3	109	41.4	1,176	1.5	525	44.6
Flintshire LA	120,566	1,200	1.0	711	59.3	408	0.3	182	44.6	1,488	1.2	745	50.1
Gwynedd LA	98,111	943	1.0	586	62.1	307	0.3	112	36.5	1,141	1.2	519	45.5
Wrexham LA	118,006	965	0.8	602	62.4	342	0.3	154	45.0	1,392	1.2	742	53.3
Health Board Total	**550,882**	**5,231**	**0.9**	**3,143**	**60.1**	**1,828**	**0.3**	**769**	**42.1**	**7,212**	**1.3**	**3,472**	**48.1**
Cardiff and Vale UHB													
Cardiff LA	320,963	2,441	0.8	1,324	54.2	853	0.3	365	42.8	3,518	1.1	1,598	45.4
Vale of Glamorgan LA	101,050	842	0.8	470	55.8	252	0.2	120	47.6	1,416	1.4	630	44.5
Health Board Total	**422,013**	**3,283**	**0.8**	**1,794**	**54.6**	**1,105**	**0.3**	**485**	**43.9**	**4,934**	**1.2**	**2,228**	**45.2**
Cwm Taf UHB													
Merthyr Tydfil LA	53,649	352	0.7	181	51.4	174	0.3	62	35.6	781	1.5	331	42.4
Rhondda Cynon Taff LA	200,418	1,538	0.8	821	53.4	762	0.4	254	33.3	2,822	1.4	1,184	42.0
Health Board Total	**254,067**	**1,890**	**0.7**	**1,002**	**53.0**	**936**	**0.4**	**316**	**33.8**	**3,603**	**1.4**	**1,515**	**42.0**
Hywel Dda UHB													
Carmarthenshire LA	137,648	1,214	0.9	619	51.0	398	0.3	157	39.4	2,186	1.6	958	43.8
Ceredigion LA	73,667	616	0.8	322	52.3	222	0.3	88	39.6	925	1.3	372	40.2
Pembrokeshire LA	89,966	1,040	1.2	632	60.8	480	0.5	200	41.7	1,475	1.6	628	42.6
Health Board Total	**301,281**	**2,870**	**1.0**	**1,573**	**54.8**	**1,100**	**0.4**	**445**	**40.5**	**4,586**	**1.5**	**1,958**	**42.7**
Powys Teaching HB	103,005	967	0.9	526	54.4	294	0.3	130	44.2	1,598	1.6	650	40.7
Wales Total	**2,558,332**	**21,726**	**0.8**	**12,138**	**55.9**	**8,395**	**0.3**	**3,406**	**40.6**	**35,149**	**1.4**	**15,680**	**44.6**

Table A3. Uptake of influenza immunisation in pregnant women, with breakdown for those who have another clinical risk condition in Wales 2015/16**.**

Local Authority	Pregnant women with clinical risk			Pregnant women without clinical risk			Total pregnant women		
	Immunised (n)	Denominator (n)	Uptake (%)	Immunised (n)	Denominator (n)	Uptake (%)	Immunised (n)	Denominator (n)	Uptake (%)
Abertawe Bro Morgannwg UHB									
Bridgend LA	80	147	54.4	491	1,241	39.6	571	1,388	41.1
Neath Port Talbot LA	68	116	58.6	416	887	46.9	484	1,003	48.3
Swansea LA	124	219	56.6	801	1,876	42.7	925	2,095	44.2
Health Board Total	**272**	**482**	**56.4**	**1,708**	**4,004**	**42.7**	**1,980**	**4,486**	**44.1**
Aneurin Bevan UHB									
Blaenau Gwent LA	39	57	68.4	268	603	44.4	307	660	46.5
Caerphilly LA	79	148	53.4	555	1,427	38.9	634	1,575	40.3
Monmouthshire LA	77	122	63.1	316	732	43.2	393	854	46.0
Newport LA	82	147	55.8	627	1,533	40.9	709	1,680	42.2
Torfaen LA	78	116	67.2	355	786	45.2	433	902	48.0
Health Board Total	**355**	**590**	**60.2**	**2,121**	**5,081**	**41.7**	**2,476**	**5,671**	**43.7**
Betsi Cadwaladr UHB									
Anglesey LA	69	104	66.3	348	679	51.3	417	783	53.3
Conwy LA	80	135	59.3	425	948	44.8	505	1,083	46.6
Denbighshire LA	81	113	71.7	454	963	47.1	535	1,076	49.7
Flintshire LA	107	169	63.3	684	1,357	50.4	791	1,526	51.8
Gwynedd LA	95	163	58.3	605	1,172	51.6	700	1,335	52.4
Wrexham LA	120	187	64.2	605	1,318	45.9	725	1,505	48.2
Health Board Total	**552**	**871**	**63.4**	**3,121**	**6,437**	**48.5**	**3,673**	**7,308**	**50.3**
Cardiff and Vale UHB									
Cardiff LA	289	444	65.1	1,714	3,407	50.3	2,003	3,851	52.0
Vale of Glamorgan LA	76	124	61.3	523	1,053	49.7	599	1,177	50.9
Health Board Total	**365**	**568**	**64.3**	**2,237**	**4,460**	**50.2**	**2,602**	**5,028**	**51.8**
Cwm Taf UHB									
Merthyr Tydfil LA	42	61	68.9	225	503	44.7	267	564	47.3
Rhondda Cynon Taff LA	91	164	55.5	645	1,576	40.9	736	1,740	42.3
Health Board Total	**133**	**225**	**59.1**	**870**	**2,079**	**41.8**	**1,003**	**2,304**	**43.5**
Hywel Dda UHB									
Carmarthenshire LA	103	170	60.6	521	1,251	41.6	624	1,421	43.9
Ceredigion LA	36	65	55.4	248	547	45.3	284	612	46.4
Pembrokeshire LA	62	118	52.5	308	841	36.6	370	959	38.6
Health Board Total	**201**	**353**	**56.9**	**1,077**	**2,639**	**40.8**	**1,278**	**2,992**	**42.7**
Powys Teaching HB	100	147	68.0	543	1,054	51.5	643	1,201	53.5
Wales Total	**1,978**	**3,236**	**61.1**	**11,677**	**25,754**	**45.3**	**13,655**	**28,990**	**47.1**

Table A4. Uptake of influenza immunisation in those aged six months to 64 years and recorded as being a carer in Wales in 2015/16.

Local Authority	Total carers		
	Immunised (n)	Denominator (n)	Uptake (%)
Abertawe Bro Morgannwg UHB			
Bridgend LA	478	1,054	45.4
Neath Port Talbot LA	484	831	58.2
Swansea LA	658	1,497	44.0
Health Board Total	**1,620**	**3,382**	**47.9**
Aneurin Bevan UHB			
Blaenau Gwent LA	209	434	48.2
Caerphilly LA	673	1,233	54.6
Monmouthshire LA	709	1,351	52.5
Newport LA	760	1,642	46.3
Torfaen LA	572	1,047	54.6
Health Board Total	**2,923**	**5,707**	**51.2**
Betsi Cadwaladr UHB			
Anglesey LA	419	716	58.5
Conwy LA	475	1,004	47.3
Denbighshire LA	584	1,193	49.0
Flintshire LA	851	1,804	47.2
Gwynedd LA	562	994	56.5
Wrexham LA	835	1,649	50.6
Health Board Total	**3,726**	**7,360**	**50.6**
Cardiff and Vale UHB			
Cardiff LA	927	2,023	45.8
Vale of Glamorgan LA	408	812	50.2
Health Board Total	**1,335**	**2,835**	**47.1**
Cwm Taf UHB			
Merthyr Tydfil LA	160	285	56.1
Rhondda Cynon Taff LA	850	1,652	51.5
Health Board Total	**1,010**	**1,937**	**52.1**
Hywel Dda UHB			
Carmarthenshire LA	876	1,779	49.2
Ceredigion LA	471	1,021	46.1
Pembrokeshire LA	817	1,939	42.1
Health Board Total	**2,164**	**4,739**	**45.7**
Powys Teaching HB	480	1,026	46.8
Wales Total	**13,258**	**26,986**	**49.1**

Table A5. Uptake of influenza immunisation in those aged six months to 64 years and recorded as being morbidly obese in Wales in 2015/16.

Local Authority	Morbidly obese		
	Immunised (n)	Denominator (n)	Uptake (%)
Abertawe Bro Morgannwg UHB			
Bridgend LA	140	449	31.2
Neath Port Talbot LA	71	179	39.7
Swansea LA	165	503	32.8
Health Board Total	**376**	**1,131**	**33.2**
Aneurin Bevan UHB			
Blaenau Gwent LA	167	595	28.1
Caerphilly LA	248	690	35.9
Monmouthshire LA	79	174	45.4
Newport LA	166	463	35.9
Torfaen LA	129	372	34.7
Health Board Total	**789**	**2,294**	**34.4**
Betsi Cadwaladr UHB			
Anglesey LA	119	275	43.3
Conwy LA	78	190	41.1
Denbighshire LA	94	227	41.4
Flintshire LA	70	164	42.7
Gwynedd LA	123	380	32.4
Wrexham LA	125	298	41.9
Health Board Total	**609**	**1,534**	**39.7**
Cardiff and Vale UHB			
Cardiff LA	270	739	36.5
Vale of Glamorgan LA	106	296	35.8
Health Board Total	**376**	**1,035**	**36.3**
Cwm Taf UHB			
Merthyr Tydfil LA	69	163	42.3
Rhondda Cynon Taff LA	275	889	30.9
Health Board Total	**344**	**1,052**	**32.7**
Hywel Dda UHB			
Carmarthenshire LA	140	466	30.0
Ceredigion LA	77	289	26.6
Pembrokeshire LA	39	86	45.3
Health Board Total	**256**	**841**	**30.4**
Powys Teaching HB	72	220	32.7
Wales Total	**2,822**	**8,107**	**34.8**

Table A6. Uptake of influenza immunisation, through general practice, in children aged two and three years in Wales in 2015/16.

Local Authority	Two year olds			Three year olds		
	Immunised (n)	Denominator (n)	Uptake (%)	Immunised (n)	Denominator (n)	Uptake (%)
Abertawe Bro Morgannwg UHB						
Bridgend LA	712	1,740	40.9	700	1,773	39.5
Neath Port Talbot LA	416	1,456	28.6	424	1,540	27.5
Swansea LA	861	2,638	32.6	935	2,898	32.3
Health Board Total	**1,989**	**5,834**	**34.1**	**2,059**	**6,211**	**33.2**
Aneurin Bevan UHB						
Blaenau Gwent LA	371	847	43.8	302	790	38.2
Caerphilly LA	957	2,151	44.5	930	2,172	42.8
Monmouthshire LA	587	991	59.2	560	1,039	53.9
Newport LA	898	1,987	45.2	866	1,934	44.8
Torfaen LA	519	1,131	45.9	435	1,092	39.8
Health Board Total	**3,332**	**7,107**	**46.9**	**3,093**	**7,027**	**44.0**
Betsi Cadwaladr UHB						
Anglesey LA	367	731	50.2	381	754	50.5
Conwy LA	591	1,170	50.5	548	1,176	46.6
Denbighshire LA	567	1,128	50.3	498	1,065	46.8
Flintshire LA	936	1,621	57.7	925	1,730	53.5
Gwynedd LA	730	1,334	54.7	708	1,411	50.2
Wrexham LA	924	1,740	53.1	914	1,765	51.8
Health Board Total	**4,115**	**7,724**	**53.3**	**3,974**	**7,901**	**50.3**
Cardiff and Vale UHB						
Cardiff LA	2,045	4,341	47.1	1,948	4,543	42.9
Vale of Glamorgan LA	705	1,427	49.4	635	1,466	43.3
Health Board Total	**2,750**	**5,768**	**47.7**	**2,583**	**6,009**	**43.0**
Cwm Taf UHB						
Merthyr Tydfil LA	334	777	43.0	350	796	44.0
Rhondda Cynon Taff LA	1,353	2,836	47.7	1,212	2,920	41.5
Health Board Total	**1,687**	**3,613**	**46.7**	**1,562**	**3,716**	**42.0**
Hywel Dda UHB						
Carmarthenshire LA	787	1,875	42.0	864	1,984	43.5
Ceredigion LA	335	833	40.2	358	871	41.1
Pembrokeshire LA	502	1,170	42.9	554	1,342	41.3
Health Board Total	**1,624**	**3,878**	**41.9**	**1,776**	**4,197**	**42.3**
Powys Teaching HB	603	1,267	47.6	619	1,287	48.1
Wales Total	**16,100**	**35,191**	**45.8**	**15,666**	**36,348**	**43.1**

Appendix B: Additional and health board level influenza surveillance data

Table B1. Respiratory samples submitted and tested for influenza in Wales in 2015/16, by sample location.

Sample Location	Influenza A		Influenza B		RSV		Negative		All screens	
	n	%	n	%	n	%	n	%	n	%
Sentinel Practice	140	20.3	37	11.5	2	1.4	67	2.3	198	3.8
Non-sentinel Practice	18	2.6	21	6.5	3	2.1	72	2.4	126	2.4
Total Community Samples	**158**	**22.9**	**58**	**18.0**	**5**	**3.5**	**139**	**4.7055**	**324**	**6.2**
Hospital - General	347	50.4	198	61.5	104	73.8	1982	67.1	3551	68.1
Hospital - A&E	67	9.7	40	12.4	12	8.5	240	8.1	388	7.4
Hospital - ITU	106	15.4	21	6.5	13	9.2	543	18.4	851	16.3
Total Hospital Samples	**520**	**75.5**	**259**	**80.4**	**129**	**91.5**	**2765**	**93.6**	**4790**	**91.8**
Other / Unknown locations	11	1.6	5	1.6	7	5.0	50	1.7	103	2.0
Total	**689**	**-**	**322**	**-**	**141**	**-**	**2954**	**-**	**5217**	**-**

Table B2. Influenza-like illness diagnosed in general practices in Wales in 2015/16, by health board.

Health Board	Influenza-like illness clinically diagnosed	
	n	%
Abertawe Bro Morgannwg HB	1538	15.6
Aneurin Bevan HB	1634	16.6
Betsi Cadwaladr UHB	2089	22.7
Cardiff & Vale UHB	2242	22.7
Cwm Taf HB	890	9.0
Hywel Dda HB	1134	11.5
Powys Teaching HB	341	3.5
Total	**9868**	**-**

Table B3. Respiratory samples collected from patients admitted to hospital and tested for influenza in Wales in 2015/16, by health board.

	Influenza A		Influenza B		Negative		All screens	
Health Board	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Abertawe Bro Morgannwg HB	59	17.2	34	17.2	198	10.2	499	14.3
Aneurin Bevan HB	26	7.6	11	5.6	123	6.4	207	5.9
Betsi Cadwaladr UHB	25	7.3	5	2.5	72	3.7	136	3.9
Cardiff & Vale UHB	181	52.6	131	66.2	1394	72.0	2370	68.0
Cwm Taf HB	9	2.6	3	1.5	16	0.8	37	1.1
Hywel Dda HB	44	12.8	14	7.1	133	6.9	238	6.8
Powys Teaching HB	0	0.0	0	0.0	0	0.0	0	0.0
Total	**344**	-	**198**	-	**1936**	-	**3487**	-

Table B4. Respiratory samples collected from patients admitted to hospital A&E wards and tested for influenza in Wales in 2015/16, by health board.

	Influenza A		Influenza B		Negative		All screens	
Health Board	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Abertawe Bro Morgannwg HB	4	6.0	3	7.5	16	6.7	23	5.9
Aneurin Bevan HB	6	9.0	1	2.5	13	5.4	20	5.2
Betsi Cadwaladr UHB	13	19.4	2	5.0	10	4.2	26	6.7
Cardiff & Vale UHB	34	50.7	24	60.0	165	68.8	260	67.0
Cwm Taf HB	1	1.5	1	2.5	5	2.1	8	2.1
Hywel Dda HB	9	13.4	9	22.5	31	12.9	51	13.1
Powys Teaching HB	0	0.0	0	0.0	0	0.0	0	0.0
Total	**67**	-	**40**	-	**240**	-	**388**	-

Table B5. Respiratory samples collected from patients admitted to hospital ITU/HDU wards and tested for influenza in Wales in 2015/16, by health board.

	Influenza A		Influenza B		Negative		All screens	
Health Board	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Abertawe Bro Morgannwg HB	31	29.2	7	33.3	176	32.4	259	30.4
Aneurin Bevan HB	15	14.2	2	9.5	58	10.7	103	12.1
Betsi Cadwaladr UHB	16	15.1	3	14.3	54	9.9	86	10.1
Cardiff & Vale UHB	14	13.2	6	28.6	159	29.3	263	30.9
Cwm Taf HB	9	8.5	2	9.5	26	4.8	40	4.7
Hywel Dda HB	21	19.8	1	4.8	70	12.9	100	11.8
Powys Teaching HB	0	0.0	0	0.0	0	0.0	0	0.0
Total	**106**	-	**21**	-	**543**	-	**851**	-

Appendix figure B1: Genetic characterisation of the HA gene of H1N1pdm09 viruses isolated in Wales during the 2015/16 season.
Major amino acid changes are indicated showing the extent of variation within subgroup 6B.