

# 2.1 Influenza

## Summary

### 2011/2012 influenza season summary:

Peak influenza-like illness rate: 41.3 / 100,000  
Total confirmed influenza cases hospitalised: 147  
Total confirmed influenza cases admitted to ICU: 15  
Total influenza-associated deaths: 13 (7 confirmed & 6 probable)

HPSC has worked in collaboration with the National Virus Reference Laboratory (NVRL), the Irish College of General Practitioners (ICGP) and the Departments of Public Health on the influenza sentinel surveillance project since 2000. Sixty general practices (located in all HSE-Areas) were recruited to report electronically, on a weekly basis, the number of patients who consulted with influenza-like illness (ILI). Sentinel GPs were requested to send a combined nasal and throat swab on one ILI patient per week to the NVRL. The NVRL also tested respiratory non-sentinel specimens, referred mainly from hospitals.

Other surveillance systems set up to monitor ILI/ influenza activity include:

- Surveillance of all calls to GP out-of-hours (OOHs) centres, monitored for self-reported influenza. These data were provided by HSE-NE.
- Surveillance of all confirmed influenza notifications, including hospitalisation status reported to the Computerised Infectious Disease Reporting System (CIDR) in Ireland.
- Enhanced surveillance of hospitalised influenza cases aged 0-14 years.
- Intensive Care Society of Ireland (ICSI) enhanced surveillance of all critical care patients with confirmed influenza and enhanced surveillance of all severe acute respiratory infections (SARI) in two pilot ICU sites.
- Enhanced surveillance of all confirmed influenza deaths.
- A network of sentinel hospitals reporting admissions data

The data presented in this summary were based on data reported to HPSC by the 16<sup>th</sup> November 2012. Due to legislation regarding the registration of deaths in Ireland; there can be significant delays between the date of death and the registration of deaths and subsequent reporting to HPSC.

### Sentinel GP Clinical Data

Influenza activity in Ireland was low during the 2011/2012-influenza season, with sentinel GP ILI consultation rates peaking at 41.3 per 100,000 population during week 8 2012 (February) (figure 1). ILI rates first increased above baseline levels (25.9 per 100,000) during week 7 2012 and remained there for only three weeks. ILI age specific rates in all age groups during the 2011/2012 season, were the lowest recorded for a number of seasons. The highest age specific ILI rates were in the 0-4 year age group (peaking at 70.7/100,000), followed by those aged 5-14 years (51.4/100,000), 15-64 years (42.4/100,000) and those aged 65 years or older (34.7/100,000).

### Virological Data

The NVRL tested 509 sentinel specimens for influenza virus during the 2011/2012 season. One hundred and eighty-six (36.5%) sentinel specimens were positive for influenza: 172 influenza A (169 A (H3), 1 A (H1)pdm09 and 2 A untyped) and 14 influenza B. At the peak of influenza activity, the proportion of influenza positive sentinel specimens reached 69.7% (during week 9 2012).

The NVRL tested 4,499 non-sentinel respiratory specimens during the 2011/2012 season, 371 (8.2%) of which were positive for influenza: 355 influenza A (312 A (H3) and 43 A (untyped)) and 16 influenza B. The proportion of influenza positive non-sentinel specimens peaked at 21.3% (during week 7 2012).

Influenza A (H3) was the dominant influenza virus circulating during the 2011/2012 season. Influenza A (H3), accounted for 86.4% of all positive influenza specimens and 99.8% of all positive influenza A subtyped specimens. Influenza A accounted for 94.6%

of all influenza positive specimens and influenza B for 5.4% during the 2011/2012 season.

*Outbreaks, GP OOHs, Sentinel hospital & school data*

Seventeen general ILI/influenza outbreaks were reported: one ILI outbreak, 15 influenza A (H3) outbreaks and one influenza B outbreak. Seven outbreaks were reported from HSE-E, two from HSE-M, four from HSE-NE, two from HSE-NW and two from HSE-W. All 17 outbreaks were associated with the elderly, either in community hospitals/long stay units, residential institutions/nursing homes or hospital units for the elderly. Twelve influenza-associated deaths were linked to these outbreaks, all of whom were in those aged 80 years of age or older.

The percentage of influenza-related calls to GP out-of-hours services in Ireland, peaked during week 52 2011 at 3.6% (coinciding with the peak in respiratory syncytial virus (RSV) activity) and peaked again during week 8 2012 at 3.2% (coinciding with influenza activity). These are the lowest peak proportions recorded for several seasons. During the peak of activity, each service only received on average, 1.2 calls per hour relating to influenza.

Hospital respiratory admissions in sentinel hospitals peaked during week 7 2012, one week prior to the peak in sentinel GP ILI consultation rates. Total emergency admissions reported from sentinel hospitals peaked during week 6 2012.

*Influenza notifications*

A total of 600 influenza notifications were reported on CIDR during the 2011/2012 influenza season. The peak of influenza notifications occurred during week 10 2012, two weeks following the peak in ILI consultation rates and GP OOHs flu calls. Of the 600 notifications, 333 (55.5%) were influenza A (H3), 1 (0.2%) was influenza A (H1)pdm2009, 222 (37.0%) were influenza A (unsubtyped) and 44 (7.3%) were influenza B.

*Hospitalisation*

One hundred and forty-seven cases with confirmed influenza were hospitalised during the 2011/2012 influenza season. The highest age specific rate in hospitalised cases for the 2011/2012 season was in those less than one year of age (42.8 per 100,000 population) (table 1). Of the 147 hospitalised cases, 74 (50.3%) were influenza A (H3), 64 (43.5%) were influenza A (unsubtyped) and 9 (6.1%) were influenza B.

*Enhanced surveillance hospital data on 0-14 year age group*

A total of 140 confirmed influenza cases aged between 0 and 14 years were notified on CIDR for the 2011/2012 influenza season, 66 (47.1%) of these cases were hospitalised. Sixty-five cases (98.5%) were positive for influenza A [18 A (H3) and 47 A (unsubtyped)] and one (1.5%) was positive for influenza B. The median age of cases was 1 year, ranging from 3 weeks to 14 years. Over 75% of cases were aged between 0 and 4 years, with almost one third of cases aged less than 6

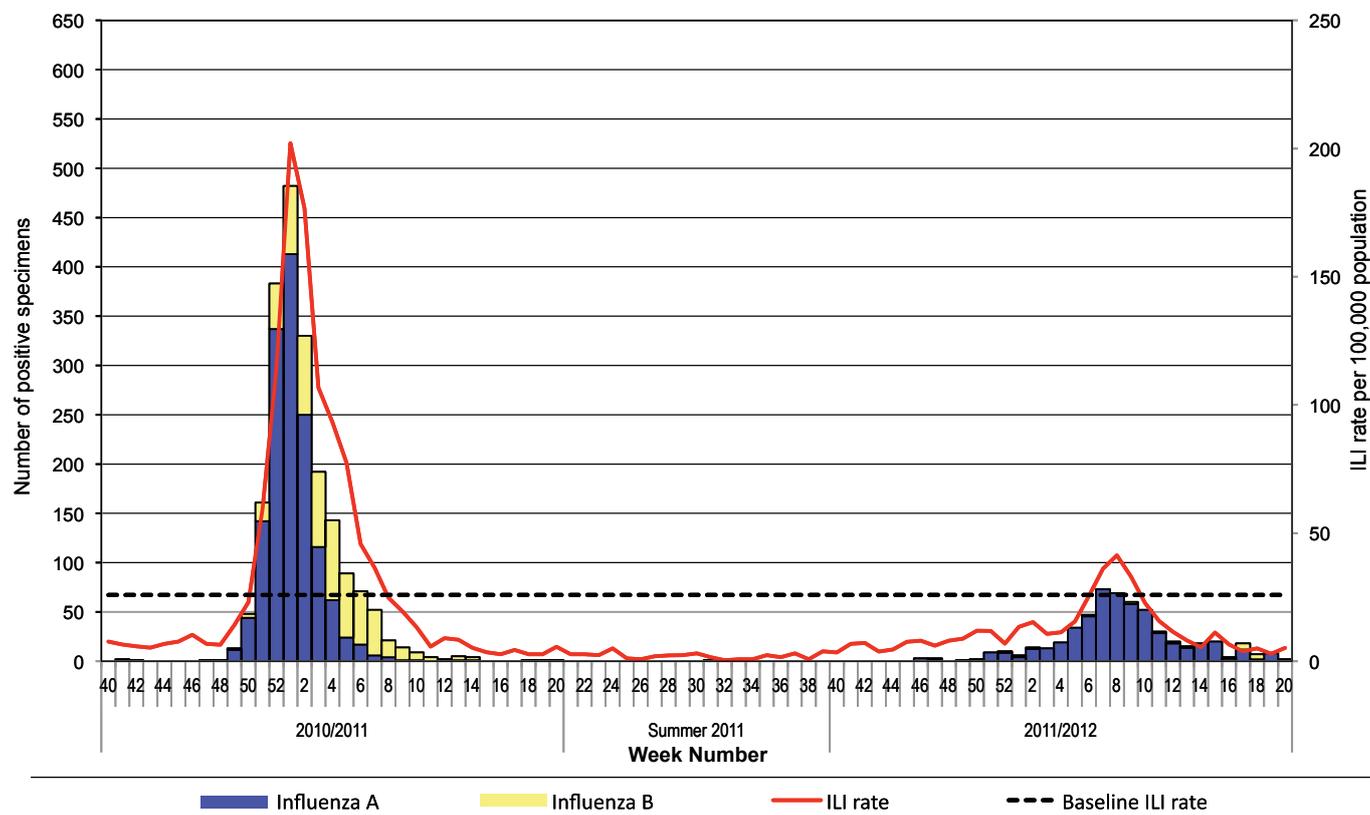


Figure 1: ILI sentinel GP consultation rates per 100,000 population, baseline ILI threshold rate, and number of positive influenza A and B specimens tested by the NVRL, by influenza week and season.

Source: Clinical ILI data from ICGP and virological data from the NVRL.

months old. Enhanced surveillance data was available for 58 (87.9%) cases. The most frequently reported symptoms included: fever (96.0%), cough (87.8%), sore throat (44.4%), fatigue (43.2%) and gastroenteric manifestations (21.6%). Complications were reported for 61.3% of cases; of these cases more than one complication was reported for 29.5% of cases. The most frequently reported complications included primary influenza viral pneumonia, secondary bacterial pneumonia, other respiratory complications, febrile convulsions and liver dysfunction. The median length of stay in hospital was 3 days (ranging from 1 - 14 days). Approximately 41.9% (18/43) of cases had underlying medical conditions, with chronic respiratory disease (including asthma) and immunosuppression being the most frequently reported. In total, vaccination status was known for 45 hospitalised paediatric cases, none of whom were vaccinated. Fourteen of the 18 cases with underlying medical conditions were not vaccinated (vaccination status was unknown for 4/18 cases). Approximately, 18% of cases (8/45) commenced antiviral treatment and 82.2% (37/45) of cases did not. Over one-fifth of cases were associated with an ILI/influenza outbreak. Five cases were admitted to critical care (for further details, see disease severity below).

#### Confirmed influenza cases admitted to ICU

Of the 147 hospitalised confirmed influenza cases, 15 (10.2%) were admitted to critical care (10 adults and 5 paediatric cases). Age specific rates for patients admitted to ICU were low in all age groups, with the highest rates in those aged less than 1 year of age (1.4 per 100,000 population) (table 1). The median age of paediatric cases was 14 months of age and the median age of adult cases was 66 years. Ten (100%) adults and three (3/4, 75.0%) paediatric cases had pre-existing medical conditions. The most frequently reported underlying medical condition for adults was chronic

respiratory disease (7/10, 75.0%). Underlying medical conditions for paediatric cases were varied. Nine (9/10, 90.0%) adults and two (2/4, 50.0%) paediatric cases were ventilated during their stay in ICU. The median length of stay in ICU for adult cases was 4.5 days (ranging from 1 - 65 days) and for paediatric cases was 3.0 days (ranging from 2 - 3 days). Vaccination status was only known for four of the 15 cases admitted to ICU, two cases were vaccinated and two were not.

#### Mortality data

During the 2011/2012 influenza season, 13 influenza-associated deaths<sup>†</sup> were reported. The case classification of influenza was confirmed for seven cases and probable for six cases. Of the seven cases with known virology, six were associated with influenza A (H3) and one with influenza B. The median age of cases who died during the 2011/2012 influenza season was 88 years, ranging from 81 – 98 years. Vaccination status was known for 12 of the 13 (92.3%) cases. Nine (75.0%) cases were vaccinated and three (25.0%) were not vaccinated with the 2011/2012 influenza vaccine (see below for further details on influenza vaccine effectiveness for the 2011/2012 season).

A summary table of confirmed influenza critical care cases and influenza-associated deaths for all ages is detailed in table 2.

#### Overview of the 2011/2012 influenza season

Influenza activity in Ireland during the 2011/2012 season started later than usual in February and was mild, with lower ILI consultation rates and lower influenza positivity rates than previous seasons. ILI rates only remained above baseline levels for three weeks, with the lowest peak rate recorded since the sentinel GP surveillance scheme began in 2000, with the exception of the 2001/2002 season (when ILI rates peaked at 29.1

Table 1: Age specific rate for confirmed influenza cases hospitalised and admitted to critical care during the 2011/2012 influenza season. Age specific rates are based on the 2011 CSO population census.

Age (years)	Hospitalised		Admitted to ICU	
	Number	Age specific rate per 100,000 pop.	Number	Age specific rate per 100,000 pop.
<1	31	42.8	1	1.4
1-4	20	7.0	3	1.1
5-14	15	2.4	1	0.2
15-24	5	0.9	1	0.2
25-34	15	2.0	1	0.1
35-44	10	1.3	0	0.0
45-54	2	0.3	0	0.0
55-64	13	2.8	2	0.4
65+	36	6.7	6	1.1
Total	147	3.2	15	0.3

<sup>†</sup>Influenza-associated deaths include all deaths where influenza is reported as the primary/main cause of death by the physician or if influenza is listed anywhere on the death certificate as the cause of death.

per 100,000 population). The predominant circulating influenza virus was influenza A (H3). There were fewer cases admitted to hospital or critical care units during the 2011/2012 season, compared to the previous two seasons which included the 2009 pandemic. The number of influenza-associated deaths reported was also lower than the previous two seasons. Of significance for the 2011/2012 season were the late season outbreaks associated with a number of deaths in residential institutions/nursing homes/units for the elderly. These outbreaks were reflected elsewhere in Europe<sup>1,2</sup>.

The WHO and ECDC reported that antigenic and genetic characterisations of circulating influenza viruses during the 2011/2012 season demonstrated an imperfect match with the A (H3N2) vaccine antigen used in the 2011/2012 influenza vaccine. Influenza B virus detections were from the Victoria and Yamagata lineages. These global data along with other vaccine effectiveness studies confirmed reduced vaccine effectiveness during the 2011/2012 influenza season<sup>3</sup>. These findings support the decision by WHO to recommend a change in the strains included in the 2012/2013 influenza vaccine.<sup>4</sup> Despite the imperfect match, early estimates of the efficacy of the 2011/2012 influenza vaccine in healthy adults was 43%, which although low is better than no vaccine. In addition to an imperfect match with the vaccine, the late start of the 2011/2012 influenza season in Europe with a resultant time lag between the beginning of the vaccination campaigns and the start of the influenza season may have resulted in waning immunity from the vaccine in the elderly population.<sup>5</sup>

#### 2012/2013 influenza season

For the 2012/2013 influenza season, existing surveillance systems have been strengthened and a number of additional measures have been put in place in Ireland to improve the surveillance of ILI/influenza. Influenza/ILI outbreak surveillance forms and guidance have been updated following the late season outbreaks

during the 2011/2012 season. Work is in progress to improve reporting of influenza vaccine uptake in risk groups for influenza. HPSC are participating in a WHO pilot project to automatically calculate the intensity of influenza each week using sentinel GP ILI consultation rates. The NVRL have introduced multiplex PCR testing for influenza A, B, RSV, adenovirus, parainfluenza virus types -1 and -3 and human metapneumovirus for all sentinel GP swabs. Surveillance of influenza notifications (including hospital status), ILI/influenza outbreaks and enhanced surveillance of confirmed hospitalised influenza cases (aged 0-14 years) and of confirmed influenza cases in critical care units (all ages) will continue for the 2012/2013 influenza season. Additional projects not detailed in this report include an all-cause mortality monitoring project associated with the European mortality monitoring group (EuroMOMO) and a pilot project on severe acute respiratory infections (SARI) cases admitted to two critical care units. Data from all of these surveillance systems will assist in guiding the management and control of influenza and any future epidemics or pandemics.

#### References

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Table 2: Summary table of confirmed influenza critical care cases and influenza-associated deaths for all ages for the pandemic period, 2010/2011 and 2011/2012 seasons. It should be noted that risk factor data was not available for all age groups for the 2011/2012 season. Rates are based on the 2011 CSO population census.

	Admitted to ICU			Influenza-associated deaths		
	Pandemic period	2010/2011	2011/2012	Pandemic period	2010/2011	2011/2012
Total cases	100	121	15	29	38	13
Crude rate per 100,000 pop.	2.2	2.6	0.3	0.6	0.8	0.3
Age range (years)	0-79	0-80	0-80	8-83	2-83	81-98
Median age (years)	34	49	60	54	57	88
Females	50	64	12	15	18	5
	50.0%	52.9%	80.0%	51.7%	47.4%	38.5%
Cases with risk factor	81	90	13	27	32	7*
	81.0%	74.4%	86.7%	93.1%	84.2%	87.5%

\*Risk factor data for influenza-associated deaths for the 2011/2012 season were only known for 7/8 cases.