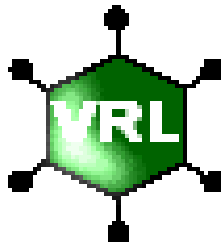


Summary Report of Influenza Season 2001/2002



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This report was produced by Lisa Domegan, NDSC

Influenza Activity and Surveillance 2001/2002

Summary

This is the second year of influenza surveillance using computerised sentinel general practices in Ireland. The National Disease Surveillance Centre (NDSC) is working in collaboration with the National Virus Reference Laboratory (NVRL) and the Irish College of General Practitioners (ICGP) on this sentinel surveillance scheme. Influenza activity in Ireland was mild during the 2001/2002 influenza season, peaking in February 2002. A total of 279 influenza-like illness cases were reported by sentinel GPs during the 2001/2002 season. Sixty-five of the 242 swabs from sentinel GPs were positive for influenza virus this season. Influenza A (H3N2) was the predominant circulating strain. A new strain of influenza, influenza A (H1N2), announced by the WHO in February 2002, was identified by the NVRL in sentinel specimens. The identification of this strain by the NVRL is highly significant; it highlights how effective the sentinel surveillance scheme is in identifying new influenza strains in a timely manner. This will be crucial in the event of an influenza epidemic or pandemic.

Influenza A (H1N2)

In February 2002, the WHO announced the isolation of a new strain of influenza A virus. Since 1977, two influenza A virus subtypes, A (H1N1) and A (H3N2) have circulated widely among humans. The new strain, influenza A (H1N2) appears to have resulted from the reassortment of genes in the current circulating H1N1 and H3N2 subtypes. Influenza A (H1N2) has been isolated from humans in Ireland, England, Scotland, France, Israel, Egypt, the US and Canada during the 2001/2002 season. This strain was previously detected in China during the 1988/1989 influenza season. Further spread of these reassortment viruses in humans did not occur at the time. As the new strain is a combination of the two components (H1N1 and H3N2) present in the 2001/2002 influenza vaccine, vaccinees should have a good level of immunity. Those not vaccinated should also have some immunity as the H1N1 and H3N2 strains have been in circulation for the last two decades. To date, no unusual clinical illnesses are associated with the new strain.^{1,2}

2002/2003 influenza vaccine

The composition of the vaccine for the 2002/2003 Northern Hemisphere influenza season is: A/New Caledonia/20/99 (H1N1)-like virus, A/Panama (H3N2)-like virus (the widely used vaccine strain A/Panama/2007/99 is an A/Moscow/10/99-like virus) and B/Hong Kong/330/2001 (a B Victoria-like virus). The H1N1 and H3N2 components are considered to provide good protection against the new influenza A (H1N2) strain.³

Background to sentinel surveillance in Ireland

Clinical data

Thirty-two general practices were recruited to report electronically, on a weekly basis, the number of patients with influenza-like illness (ILI). ILI is defined as the sudden onset of symptoms with a temperature of 38⁰C or more, with two or more of the following: headache, sore throat, dry cough and myalgia. Patients were those attending for the first time with these symptoms.

In total, the 32 sentinel general practices cover an estimated total practice population size of 87,619, representing 2.4% of the population. The 32 practices include 20

practices from the 2000/2001 influenza season and 12 new recruits. Practices are located in all health boards with their location based on the population of each health board (table 1).

Table 1: Number of sentinel GPs by health board, percentage of total practice population and percentage of population in each health board, 2001/2002 season

Health Board/Authority	Number of GPs (n=32)	% of total practice population (n=87,619)	% of population (n=3,606,287)
ERHA	12	31.9	35.7
MHB	1	3.4	5.7
MWHB	2	4.8	8.7
NEHB	1	5.7	8.4
NWHB	2	5.1	5.8
SEHB	6	32.9	10.8
SHB	6	11.0	15.1
WHB	2	5.3	9.7

The influenza surveillance period runs from week 40 in October to week 20 in May, with the week running Monday to Sunday. Sentinel GPs send a report to the ICGP electronically every Tuesday. All data received is anonymous. Information recorded includes the general practitioner ID number and patient data (date of birth, gender, date seen, diagnosis, weekending, week number and health board). If there are no cases of ILI, zero reporting is required.

Virological data

Sentinel GPs are asked to send a combined nasopharyngeal and throat swab on one patient per week where a clinical diagnosis of ILI was made. All materials necessary for swabbing, including instructions, easily identifiable laboratory forms and stamped addressed envelopes complying with An Post regulations, were supplied by the NVRL at the commencement of the surveillance season. Swabs were sent to the NVRL for testing using Shell Vial and PCR techniques. The NVRL supplied results on a weekly basis on the number of swabs received from each of the practices. The date of swab receipt, sex, date of birth, and positive or negative results by PCR and/or Shell Vial by type and subtype are all reported.

Regional influenza activity

The Departments of Public Health send an influenza activity index (no report, no activity, sporadic-, localised-, regional- or widespread activity) every week, to NDSC. The activity index is analogous to that used by the WHO global influenza surveillance system and the European Influenza Surveillance Scheme. The index is based on sentinel GP ILI consultation rates, laboratory confirmed cases of influenza, sentinel hospital admissions data and/or sentinel school absenteeism levels. Sentinel hospital data are based on: total admissions, total A & E admissions and total respiratory admissions per week (the definition of respiratory illness in this instance includes upper respiratory tract infection, lower respiratory tract infection, pneumonia, asthma, chronic bronchitis, and exacerbations of chronic obstructive airways disease). One sentinel hospital was located in each health board. Sentinel primary and secondary schools in each health board are located in close vicinity to the sentinel GPs. Each sentinel school reports absenteeism data on a weekly basis. The activity index by health board is included in a map of Ireland in the weekly influenza report.

Weekly influenza surveillance report

NDSC is responsible for producing a weekly influenza report, which is sent to all those involved in influenza surveillance and also posted on the NDSC website. Results of clinical and virological data are reported, along with a map of influenza activity, and a summary of influenza activity worldwide.

Results for the 2001/2002 influenza season

Clinical data

GP consultations for ILI were reported on a weekly basis per 100,000 population from week 40, 2001 to week 20, 2002 (figure 1). Influenza activity was very mild during the 2001/2002 influenza season compared to the previous season. The peak GP consultation rate occurred during week 12, with a rate of 29 per 100,000 population. This is compared to a peak rate of 121 per 100,000 during the 2000/2001 influenza season. It was only during weeks 44, 47, and 48 2001 and weeks 18, 19 and 20 2002 that the rates were marginally higher than the previous season. The peak age specific consultation rate during the 2001/2002 season was in the 35-39 year age group (figure 2), with the overall rate slightly higher in males. A total of 279 ILI cases were reported by sentinel GPs during the 2001/2002-influenza season.

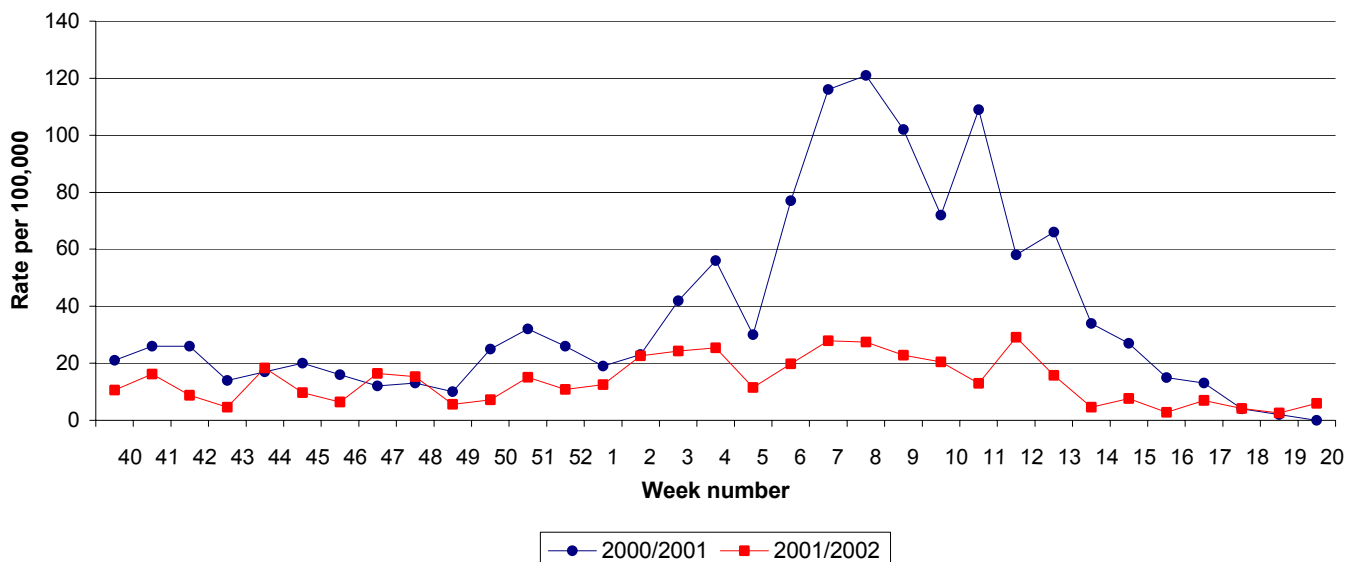


Figure 1: GP consultation rate for influenza-like illness per 100,000 population by report week, during the 2000/2001 and 2001/2002 influenza seasons.

Virological data

The NVRL received 242 swabs from sentinel GPs during the 2001/2002 influenza season. Sixty-five (26.9%) of these were positive for influenza virus (figure 3 & table 2). Influenza virus was only detected between weeks 3 and 17 2002. The highest number of positive swabs was during week 6, with 69% of swabs positive [(50% of these were influenza A (H3N2)]. During the period of peak clinical activity, week 12, 58% of swabs were positive. Only one (1.5%) influenza B virus was detected this season. Influenza A accounted for 64 (98.5%) of the positive swabs: 5 (7.7%) influenza A (H1N1) and 15 (23.1%) influenza A (H1N2). Influenza A (H3N2) predominated this season with 44 (67.7%) swabs positive, peaking in the 30 to 34 year age group (figure 4).

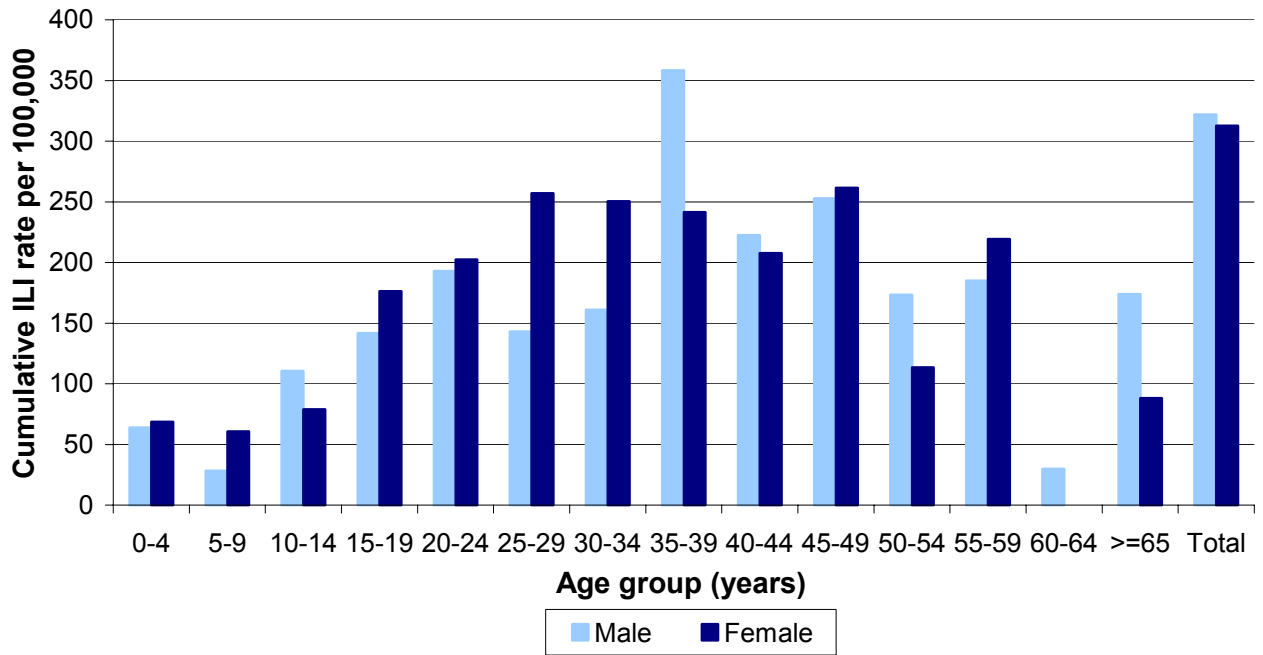


Figure 2: Age and sex specific ILI rate per 100,000 population between week 40 2001 and week 20 2002. The denominator used in the age and sex specific consultation rate is from the 1996 census data; this assumes that the age and sex distribution of the sentinel general practices is similar to the national age and sex distribution.

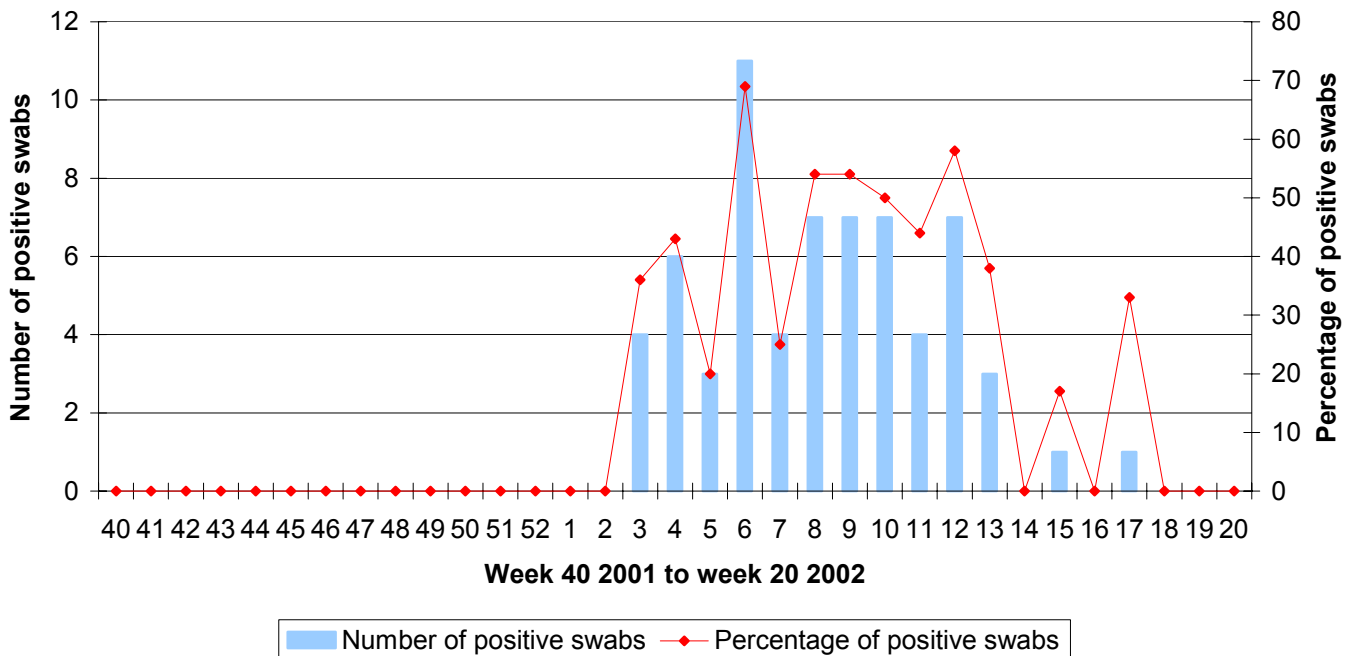


Figure 3: Number and percentage of influenza virus detections during the 2001/2002-influenza season.

Table 2: Sentinel influenza results by type, subtype and report week for 2001/2002

<i>Week number</i>	<i>Total swabs</i>	<i>Positive swabs</i>	<i>Percentage positive</i>	<i>A (H1N1)</i>	<i>A (H1N2)</i>	<i>A (H3N2)</i>	<i>B</i>
40	4	0	0%	0	0	0	0
41	4	0	0%	0	0	0	0
42	4	0	0%	0	0	0	0
43	2	0	0%	0	0	0	0
44	2	0	0%	0	0	0	0
45	6	0	0%	0	0	0	0
46	3	0	0%	0	0	0	0
47	10	0	0%	0	0	0	0
48	8	0	0%	0	0	0	0
49	6	0	0%	0	0	0	0
50	8	0	0%	0	0	0	0
51	9	0	0%	0	0	0	0
52	1	0	0%	0	0	0	0
1	7	0	0%	0	0	0	0
2	10	0	0%	0	0	0	0
3	11	4	36%	1	0	3	0
4	14	6	43%	0	0	6	0
5	15	3	20%	0	2	1	0
6	16	11	69%	1	2	8	0
7	16	4	25%	0	0	4	0
8	13	7	54%	0	4	3	0
9	13	7	54%	0	0	7	0
10	14	7	50%	0	3	4	0
11	9	4	44%	1	1	2	0
12	12	7	58%	1	1	4	1
13	8	3	38%	0	1	2	0
14	2	0	0%	0	0	0	0
15	6	1	17%	1	0	0	0
16	2	0	0%	0	0	0	0
17	3	1	33%	0	1	0	0
18	1	0	0%	0	0	0	0
19	1	0	0%	0	0	0	0
20	2	0	0%	0	0	0	0
Total	242	65	27%	5	15	44	1

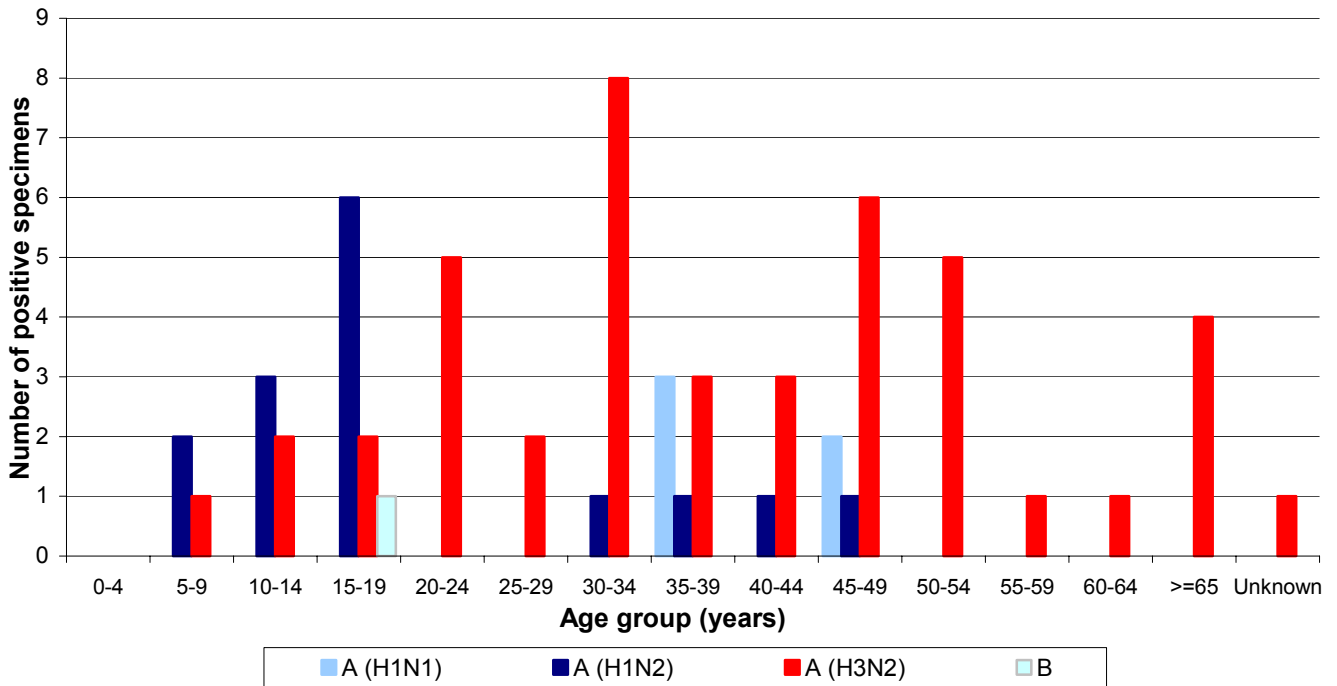


Figure 4: Number of specimens positive for influenza virus by type, subtype and age group (years) between week 40 2001 and week 20 2002.

Influenza A (H1N2)

Fifteen influenza A (H1N2) viruses were detected in Ireland during weeks 5, 6, 8, 10, 11, 12, 13 and 17 2002 by the NVRL. Influenza A (H1N2) accounted for 23.1% of all positive specimens and 23.4% of all influenza A positive specimens. Influenza A (H1N2) is the new strain of influenza virus announced by the WHO in February 2002. Eleven of the 15 cases detected by the NVRL were aged between 9 and 19 (figure 4). Nine of these cases were not vaccinated; the vaccination status of 6 cases was unknown. No unusual symptoms were associated with this new strain.

Antigenic characterisation

The NVRL referred influenza virus isolates to the World Health Organisation Laboratory in London for antigenic characterisation. The influenza B virus was antigenically closely related to B/Sichuan/379/99. Three of seven influenza A (H1) viruses were antigenically similar to A/New/Caledonia/20/99 (H1N1) and A/Egypt/96/02 (H1N2), whereas the other 4 were more closely related to A/Egypt/96/02 (H1N2). All isolates were covered by the 2001/2002 influenza vaccine.

Vaccination status

Of the 65 positive influenza virus cases, 40 (61.5%) were not vaccinated, 2 (3.1%) were vaccinated and 23 (35.4%) were of unknown vaccination status (table 3).

Table 3: Influenza vaccination status of influenza virus positive cases during the 2001/2002-influenza season (n=65)

<i>Influenza type/subtype</i>	<i>Unknown vaccination status</i>	<i>Vaccinated</i>	<i>Not vaccinated</i>	<i>Positive cases</i>
A (H1N1)	2	0	3	5
A (H1N2)	6	0	9	15
A (H3N2)	14	2	28	44
B	1	0	0	1
Total	23	2	40	65

Non-sentinel specimens

The NVRL tested 719 respiratory specimens from non-sentinel sources (GPs and hospitals) during the 2001/2002 influenza season. Seven specimens were positive for influenza A [4 A (H3N2), 1 A (H1N1) and 2 A (unsubtyped)], 2 for adenovirus, and 2 for parainfluenza virus type 3. Of the 719 respiratory specimens, 214 (29.8%) were positive for respiratory syncytial virus (RSV), peaking in week 1 2002 (figure 5).

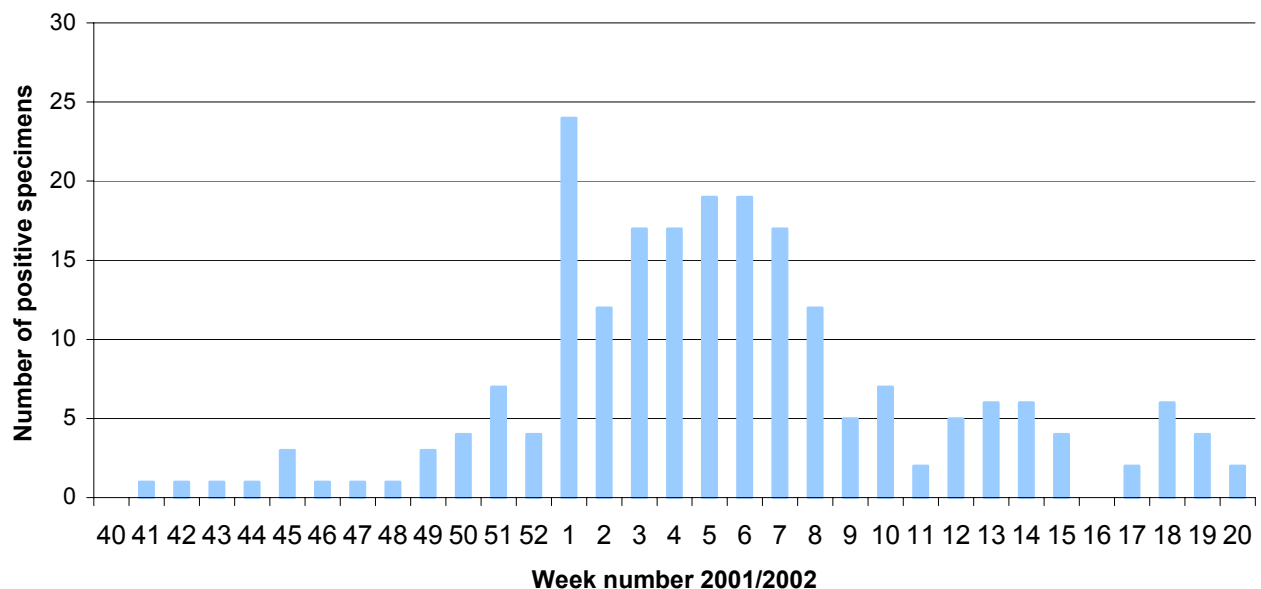


Figure 5: Non-sentinel RSV positive specimens between week 40 2001 and week 20 2002

Regional influenza activity

Localised, regional or widespread activity was not reported during the 2001/2002-influenza season. Prior to week 4 2002, 2 to 4 health boards reported sporadic influenza activity weekly, with the remainder reporting no influenza activity. Between weeks 4 and 14 2002, 4 to 6 health boards reported sporadic activity weekly. After week 14, the majority of health boards reported no influenza activity. Figure 6 is a map of influenza activity by health board during week 12, the period of peak clinical activity.

The influenza activity index was compiled using sentinel GP ILI consultation rates, laboratory confirmed cases of influenza, sentinel hospital admissions data and/or sentinel school absenteeism levels. In some health boards increases in the number of ILI cases were reflected by increases in hospital respiratory admissions and also occasionally by increases in school absenteeism, in particular primary school absenteeism.

Influenza Activity - Week 12

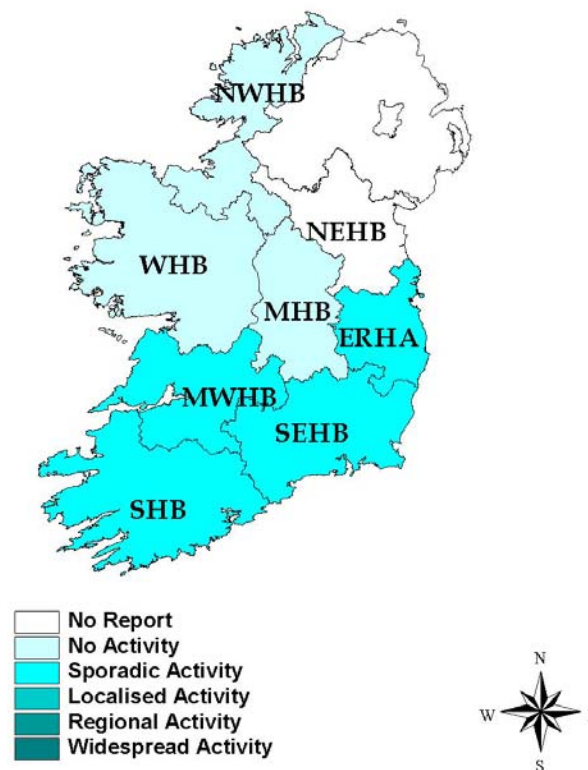


Figure 6: Map of influenza activity by health board during week 12 2002

Influenza activity worldwide

In Northern Ireland, morbidity levels for influenza and ILI were low during the 2001/2002 influenza season compared to the 2000/2001 influenza season. Influenza A (H3N2) predominated this season in Northern Ireland. In England, Scotland and Wales, consultation rates peaked during February 2002. Influenza outbreaks reported in schools in England that were investigated virologically were due to influenza A

(H1N2).² Influenza activity across Europe during the 2001/2002 influenza season was mild to moderate. Influenza A and B were co-circulating this season, with influenza A (H3N2) predominating in most European countries.¹

In the US, the 2001/2002 influenza season was also mild to moderate, with influenza A (H3N2) predominating.⁵ Influenza B/Victoria/2/87-like viruses have been detected this season. The B/Victoria lineage has not been identified outside of Asia since 1991. However, since March 2001, B/Victoria-like viruses have been detected in Canada, Hawaii, India, China, Hong Kong, Japan, Thailand, the Philippines, Oman, France, Germany, Italy, the Netherlands, and Norway. The 2001/2002 vaccine was expected to provide lower levels of protection against viruses of this lineage. An influenza B virus belonging to the B/Victoria lineage will be included in the 2002/2003 influenza vaccine. In Canada, influenza A (H3N2) was the predominant circulating strain during the 2001/2002 season. The B/Hong Kong/22/01-like viruses detected this season in Canada were antigenically different from the 2001/2002 vaccine, which was expected to provide limited cross protection against these viruses.⁶ In Hong Kong, influenza B and A (H3N2) predominated during 2001/2002. Avian influenza A (H5N1) has been confirmed in a number of farms and markets since February 2002 in Hong Kong, resulting in the culling of thousands of chickens and has led to the first chicken vaccination programme. No human cases of H5N1 virus were detected during this outbreak.

Discussion

Influenza activity has been mild in Ireland this season. Overall, influenza morbidity levels are lower this season than the 2000/2001 influenza season (which was not as intense as the 1999/2000 season). Influenza A (H3N2) has been the predominant strain circulating this season. Of significance for influenza surveillance in Ireland, the NVRL identified the new strain of influenza virus, A (H1N2) in sentinel specimens; these were not associated with any unusual clinical symptoms. It is of interest to note that the majority of A (H1N2) cases identified in Ireland were aged between 9 and 19, particularly as influenza activity associated with A (H1N2) in the UK mainly affected children and was also responsible for a number of school outbreaks. Influenza A (H3N2) was detected in all age groups, which was also reflected in the UK.²

Influenza activity can be measured not only by GP consultation rates, and laboratory confirmed cases of influenza but also through school and work absenteeism, hospital admission rates, sales of “over the counter” medications and deaths.⁴ Influenza epidemics can cause considerable social and commercial disruption on healthcare services. Among school children absenteeism due to influenza is a useful indirect measure of morbidity. During epidemics in the UK and the USA in 1976 and 1977, total school absenteeism and absenteeism specifically due to ILI corresponded closely with influenza epidemic curves. Influenza epidemics also place secondary care services under considerable pressure. Studies have revealed increases in both the number of emergency room admissions and the proportion of those attending with respiratory symptoms during influenza epidemics.⁴ However, due to the low incidence of ILI this season a direct relationship between increases in hospital admissions and school absenteeism and the incidence of ILI was difficult to ascertain. This was however a useful exercise and will be a good indicator in the future of influenza morbidity levels, in particular during influenza epidemics.

Further expansion and improvements in the present system are now being planned for the forthcoming season, including an increase in the number of sentinel GPs and the number of sentinel swabs. Influenza surveillance is essential in order to minimise the impact of this fatal infection especially in high-risk patients: the elderly, very young and people with underlying health problems. Monitoring of ILI activity in the community over a number of seasons may help to predict the potential impact of influenza on the health services.

Acknowledgements

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