Communicable Disease Surveillance Centre (NI)
Dept. of General Practice, QUB, Data Retrieval Project
Regional Virus Laboratory

Enhanced Surveillance of Influenza in Northern Ireland

Activity Report

Summary
Season 2000-2001

Influenza activity remained low throughout the season 2000-2001
Low levels of influenza activity throughout the Northern Hemisphere

Enhanced Surveillance of Influenza in Northern Ireland
Introduction

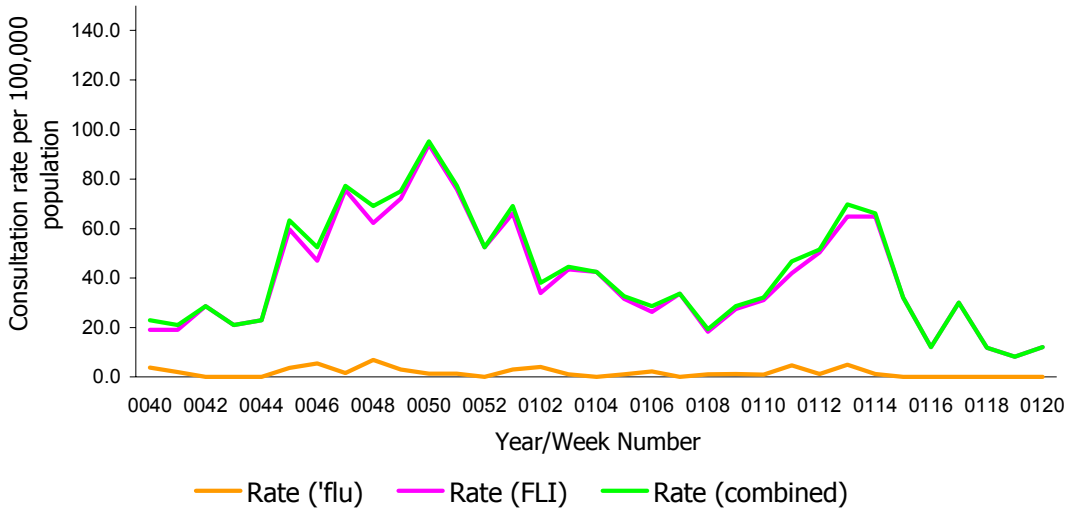
This bulletin is produced as part of the enhanced surveillance of influenza in Northern Ireland. The scheme involves the weekly compilation of consultation-based information regarding 'flu and 'flu-like illness from sixteen spotter practices across the Province (seven from EHSSB, six from NHSSB, two from SHSSB and one from WHSSB). The principal aim of the project is to provide an early warning scheme for influenza virus circulation in Northern Ireland. This winter, the scheme was piloted using these 16 practices, and it is hoped that their numbers can be increased for next winter.

The purposes of the scheme are to supplement the surveillance data already available through routine laboratory testing. Many of those who suffer from influenza will self-medicate, or may visit or contact their GP if their symptoms are more severe. It is unlikely that samples would be taken from such individuals for laboratory testing. Consequently, most samples which are tested by the laboratory originate from patients who have taken ill, become hospitalised due to an underlying condition such as diabetes or cardiorespiratory disease, or who have developed complications. By the time samples have been taken from such patients for laboratory testing, virus will have been circulating in the community for several weeks. To increase the predictive value of surveillance, it is important that more timely and representative information is retrieved. Such data could be used in the planning of resources in primary and secondary healthcare, and in turn reduce the pressures on healthcare systems, healthcare staff and patients.

Consultation rates

Consultation rates for influenza remained at low levels during the season of 2000-2001 (see Figure 1). A peak rate of 6.8 per 100,000 population was seen in week 48, and the average rate was 1.7 per 100,000 population.

Figure 1: Northern Ireland GP consultation rates for 'flu and 'flu-like illness by week number



Since this is the first year of surveillance, no baseline level of activity is available. This baseline level will be calculated once data becomes available for several seasons.

Consultation rates for flu-like illness (FLI) ranged from 9 to 93.9 per 100,000 population. Rates increased from the beginning of the surveillance period and reached the peak in week 50, before decreasing to 18.3 per 100,000 in week 8. Subsequently a further rise was seen which peaked at 64.8 per 100,000 in weeks 13 and 14. Rates continued to drop steadily until the end of the surveillance period in week 20 (see Figure 1).

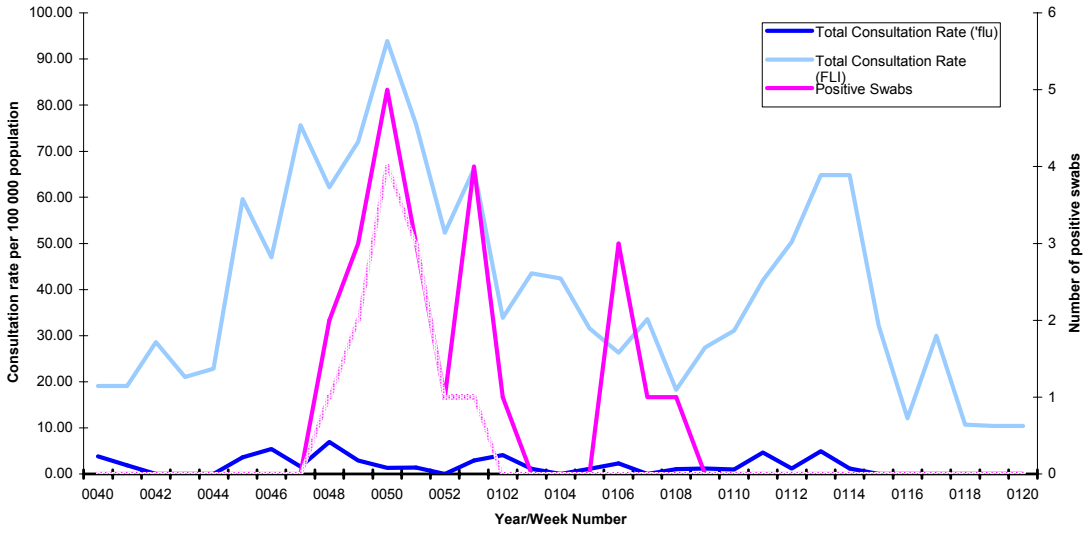
Throughout the surveillance period, consultation rates for FLI remained much higher and more variable than those for influenza. The low consultation rates for influenza reflect the low levels of influenza activity observed throughout the UK and Ireland. Rates of consultation for FLI probably reflect activity of several respiratory viruses in the community, and hence it would be feasible to observe several peaks of activity during the winter.

Virus activity in Northern Ireland

Virological Surveillance in the Community

Eleven GP surgeries were involved in an enhanced study which entailed nasal and throat swabbing of patients presenting with clinical influenza. A total of 81 swabs were submitted by GP spotter practices during the season 2000-2001. These were tested for the following viruses which are common causes of respiratory tract illness: influenza A H1N1, influenza A H3N2, influenza B, rhinovirus, adenovirus and parainfluenza virus. Twenty-seven were positive and two samples were duplicated, bringing the total number of patients who tested positive to twenty-five. Twelve of these were positive for influenza virus, all of which were influenza A H1N1. In two of the twelve cases, the swabs also tested positive for rhinovirus (common cold virus). Eight cases were positive for the presence of rhinovirus only. Two patients tested positive for the presence of adenovirus, and one tested positive for the presence of rhinovirus and adenovirus. Two patients tested positive for the presence of parainfluenza virus. Increases in virus detection in general practice coincided with peaks in consultation rates (see Figure 2).

Figure 2: Consultation rates for flu and flu-like illness and enhanced virological surveillance results, 2000-2001, Northern Ireland



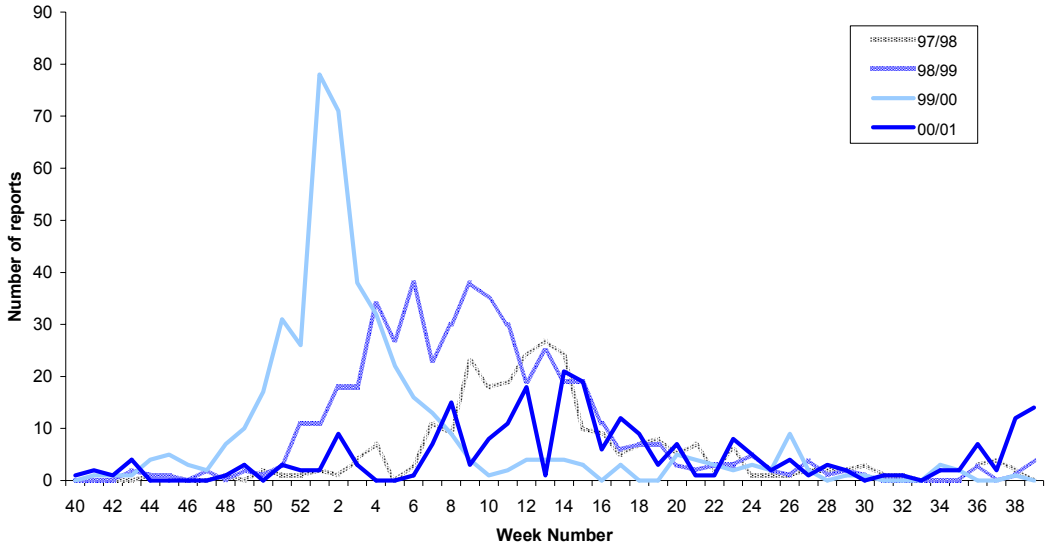
Routine Laboratory Testing

Between 2 October (week 40) 2000 and 20 May (week 20) 2001, a total of 173 samples were found positive for influenza through routine laboratory testing (see Figure 3).

Of the 173 samples, there were 5 reports of influenza B virus isolation from samples submitted in weeks 8 and 10. Influenza A virus was isolated from 2 samples submitted in weeks 8 and 9. No further typing details are available on these isolates. Influenza B virus antigens were detected in 3 samples submitted in weeks 6 and 7. One sample was PCR positive for influenza B.

The remaining 162 laboratory reports related to blood samples submitted to RVL since week 40 (2000) for serological analysis. Thirty-six were positive for influenza A antibodies and 126 for influenza B antibodies. However, since serological titres to the virus may be due to previous infection or vaccination, they cannot be relied upon as an indicator of current infection.

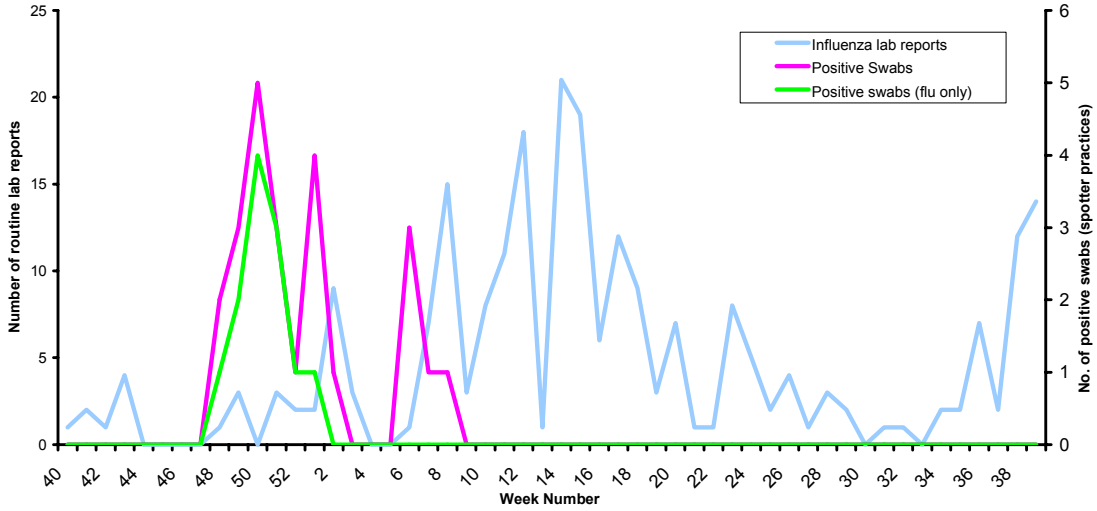
Figure 3: Routine Laboratory Reports of Influenza A and B by Date of Specimen, 2000/2001, Northern Ireland



As can be seen from the graph, the number of laboratory reports for influenza during the 2000-2001 season was much lower than any of the previous three seasons, but most closely followed the pattern of the 1997-1998 season. This was also the case for rates in the rest of the UK. The reduced level of influenza activity which was observed has therefore been reflected in the low numbers of influenza consultations observed in general practice.

When the results of routine laboratory testing are compared with the results from virological surveillance in the community, it can be seen that virus activity is detected a number of weeks earlier by the community-based surveillance (see Figure 4). The peak number of swabs positive for influenza virus occurred in week 51, whereas the first indication of increased activity was observed in week 02 of the routine laboratory testing scheme.

Figure 4: Routine laboratory reports of influenza and enhanced virological surveillance of influenza in general practice, 2000/2001, Northern Ireland



Positive swabs = positive by Polymerase Chain Reaction for any of the following: flu A H3N2, flu A H1N1, flu B, human rhinovirus, parainfluenza virus 3 or adenovirus
Positive swabs (flu only) = positive by Polymerase Chain Reaction for either flu A H1N1, flu A H3N2 or flu B

Variations and increases in consultation rates for FLI observed during winter 2000/2001 would appear to have been due to influenza and a number of other respiratory viruses. Consultation rates for FLI fluctuated much more and remained at higher levels than those observed for influenza. This reflects that fact that the "flu-like illness" category contains a number of clinical diagnoses other than influenza. Not only does this allow the measurement of other viruses which are causing morbidity in the community, but it would also appear to have captured genuine cases of influenza which may not have been classical at the time of presentation. It is also clear that both the consultation rates and virological surveillance in the community provide more timely indicators of virus activity than the routine laboratory results alone. In future seasons, it is hoped that community-based surveillance will be the basis of a time-critical warning system, with routine laboratory testing playing a more retrospective role in providing detailed epidemiological and demographic information.

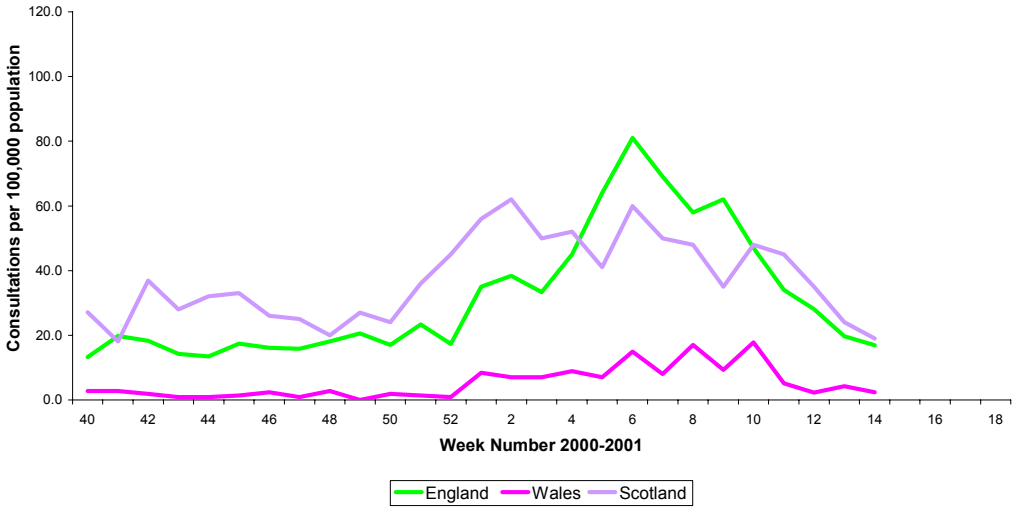
Flu surveillance elsewhere

England, Scotland and Wales

RCGP and sentinel scheme consultation figures followed a similar pattern to that seen in 1997-1998. Consultation rates in England remained below the baseline level of 50 consultations per 100,000 population until week 05, peaking at 81 per 100,000 in week 06. This rate is at the lower end of normal seasonal activity, which is defined as being between 50 and 200 consultations per 100,000 population. By week 10, rates had already returned to baseline levels. Consultation rates in Scotland remained below the baseline level of 50 consultations per 100,000 population until week 52, and peaked at 62 per 100,000 in week 02. This rate is at the lower end of normal seasonal activity, which is defined as being between 50 and 600 consultations per 100,000 population. Consultation rates in Wales remained below the lower threshold of baseline activity (25

consultations per 100,000 population) for the duration of the 2000-2001 season. The peak rate was 18 per 100,000 in week 10 (see Figure 5).

Figure 5: GP consultation rates for influenza and influenza-like illness in the United Kingdom 2000-2001



Data collected from NHS Direct during 2000-2001 indicated two peaks in total call rate. One of these occurred over the Christmas period, and the second occurred over weeks 05 and 06, coinciding with the peak in influenza surveillance figures. Problems in interpreting figures from NHS Direct were due to expansion of the system, excess calls over Christmas and a continuing rise in the baseline total call rate.

A pilot scheme took place in 6 NHS Direct sites which involved a count of callers specifically concerned with “colds/flu” (as logged by the NHS Direct nurse). These data reflected the patterns seen in total call rates. NHS Direct data will continue to be used as part of the influenza surveillance scheme.

A total of 883 influenza viruses were isolated during the 2000-2001 season. Of these, 323 of those isolated were influenza A viruses, and 560 were influenza B viruses. Of 720 samples submitted from sentinel GPs for PCR testing, 252 were positive for influenza (86 influenza A and 166 influenza B). Forty three tested positive for RSV. The majority of the influenza A isolates isolates were antigenically similar to this year’s vaccine strains, though three were more closely related to an old H1N1 strain. However, the new strain produces high titres of antibody that cross-react with the old strain. The influenza B isolates were closely related to the current vaccine strain.

Republic of Ireland

Influenza activity in the Republic of Ireland reached a peak of 121 consultations for

influenza-like illness per 100,000 population in week 08. In total, the National Disease Surveillance Centre (NDSC) reported 171 laboratory detections of influenza by PCR and/or culture: 90 were influenza A and 81 were influenza B. Laboratory reports for 128 influenza virus antibody detections were received from 2nd October 2000 to 12th May 2001: 82 were influenza A and 46 were influenza B.

Elsewhere

Influenza activity in Europe during 2000-2001 was mostly due to influenza A (H1N1). Most of the influenza A activity took place before March, after which time influenza B became the predominant strain. Reports of influenza C were received from France during week 09. In general, levels of activity remained limited. Between 27th August 2000 and 21st April 2001, 46,336 samples were tested for influenza viruses in Canada. Influenza A and B occurred in approximately equal proportions. In the USA, 80,686 specimens were tested for influenza viruses between 1st October 2000 and 16th April 2001, and 9,563 were positive. Again, influenza A and B occurred in approximately equal proportions.