

**Communicable Disease Surveillance Centre (NI)
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Regional Virus Laboratory
Northern Ireland Sentinel Community Pharmacies
Northern Ireland Statistics and Research Agency**

**Enhanced Surveillance of Influenza
in Northern Ireland**

**Summary
Season 2005-2006**

This summary is circulated to Trust Chief Executives, Directors of Public Health, Consultants in Communicable Disease Control, participating practices and other interested parties. We would encourage you to disseminate it internally to any relevant personnel. For further information or any comments on the contents or presentation of this document, please contact Dr Hilary Kennedy at 028 9026 3765 or E-mail hilary.kennedy@hpa.org.uk

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- ◆ **Normal levels of influenza virus in circulation throughout winter 2005-06**
- ◆ **Predominant strain was influenza B**
- ◆ **Rates of 'flu-like illness were, once again, highest in school-age children**

Enhanced Surveillance of Influenza in Northern Ireland

Introduction

This bulletin is produced as part of the enhanced surveillance of influenza in Northern Ireland. The principal aim of the project is to provide an early warning scheme for influenza virus circulation in Northern Ireland. The scheme involves the weekly compilation of data from sentinel GP practices and Out-of-Hours Centres (formerly Co-Operatives).

For the 2005-06 season, two new developments were introduced:

- (i) A pharmacy-based syndromic surveillance pilot study was developed in association with the Pharmacy Group of DHSSPS. One of the aims of this pilot study was to explore the additional potential for early detection of influenza/respiratory infection in the population by monitoring the sale of over-the-counter cough and cold medications in a number of pharmacies throughout Northern Ireland. Preliminary analysis of retrospective data prior to the commencement of the 2005-06 season indicated that this type of surveillance should further increase the predictive value of the existing ESINI scheme.
- (ii) The Northern Ireland Statistics and Research Agency (NISRA) undertook to provide the ESINI scheme with data relating to the number of deaths, which may be attributable to influenza or complications thereof, registered each week in Northern Ireland during the 2005-06 season. A number of keywords were used to carry out these searches and, in addition, NISRA kindly provided CDSC (NI) with retrospective mortality data.

Sentinel GP Practices

During the 2005-06 season, consultation-based information regarding 'flu and 'flu-like illness was supplied by twenty-four spotter practices across the Province (twelve from EHSSB, four from NHSSB, five from SHSSB and three from WHSSB). Together, these practices account for 148 239 persons, which is approximately 8.7 % of the population. The majority of these practices have contributed to the ESINI scheme each year since it began, in October 2000.

Out-of-Hours Centres

Five NI Out-of-Hours Centres agreed to supply information to the scheme for the 2005-06 season. These Out-of-Hours Centres cover 1 262 892 persons (74% of the population) in the majority of areas in the Province. Data was supplied to CDSC (NI) in the form of total calls to each Centre per week and included a breakdown of those calls by age and sex. In addition, two Out-of-Hours Centres (serving approximately 15 % of the population) were, once again, able to provide details on the numbers of individuals (by age-group) covered by their out-of-hours services. Therefore, for the first time, it became possible to calculate Co-Op age-specific call rates (although it should be noted that these calls were not coded and may have been due to a variety of illnesses over the winter period e.g. respiratory, gastrointestinal). It is hoped that, for the 2006-07 season, it will be possible to identify the proportion of calls each week coded as 'flu-like illness or acute respiratory infection by a number of Out-of-Hours Centres. This has been facilitated by the roll-out of a new software system across the Province.

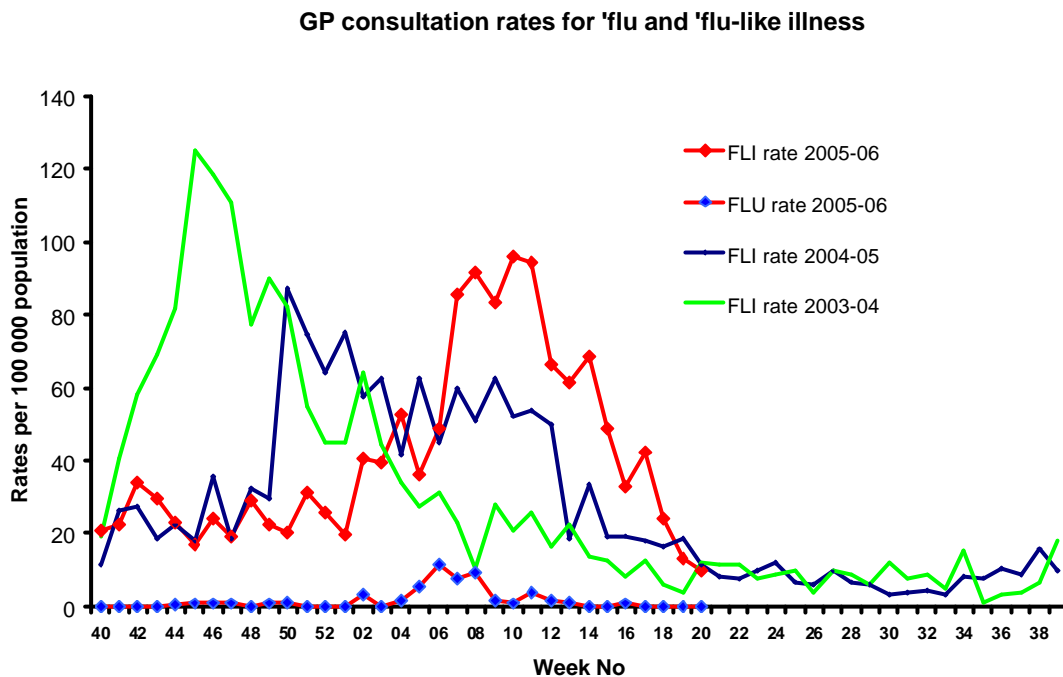
The purpose of the scheme is to supplement the surveillance data already available through routine laboratory testing. Many of those who suffer from influenza will self-medicate, or may visit or contact their GP (or nearest Out-of-Hours Centre) if their symptoms are more severe. It is unlikely that samples 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. One way in which this has been achieved over the past few years is to request that as many sentinel GPs as possible also take part in enhanced virological surveillance. This involves the taking of nasal and throat swabs from patients presenting with clinical influenza and submission of them to the Regional Virus Laboratory for testing. Preliminary analysis of retrospective data obtained through the pharmacy-based syndromic surveillance pilot study indicated that this type of surveillance should further increase the predictive value of the existing ESINI scheme.

Consultation rates

Sentinel GP Practices

With the continued concern over avian influenza, it has become important that unexplained respiratory illness, particularly in travellers returning from affected areas, needs to be investigated quickly and rigorously. For this reason, and in order to assist with establishing baselines for 'flu and 'flu-like illness in Northern Ireland, sentinel GPs have been requested, since mid-2003, to provide consultation data throughout the year. Almost all have done so. During 2005-06, GP consultation rates for 'flu and flu-like illness were as would be expected during a normal winter (Figure 1).

Figure 1:



Sixteen GP surgeries also agreed to take part in enhanced virological surveillance during last winter, taking nasal and throat swabs of patients presenting with clinical influenza. A total of 115 swabs were submitted to the Regional Virus Laboratory by sentinel GPs between Week 40 of 2005 and Week 20 of 2006.

In Week 03 of 2006, the first influenza B case of the season (a middle-aged adult) was confirmed in a sentinel practice. Further detections of influenza B occurred for two weeks before overlapping, in Week 06 of 2006, with the first influenza A H3 sentinel detection of the season.

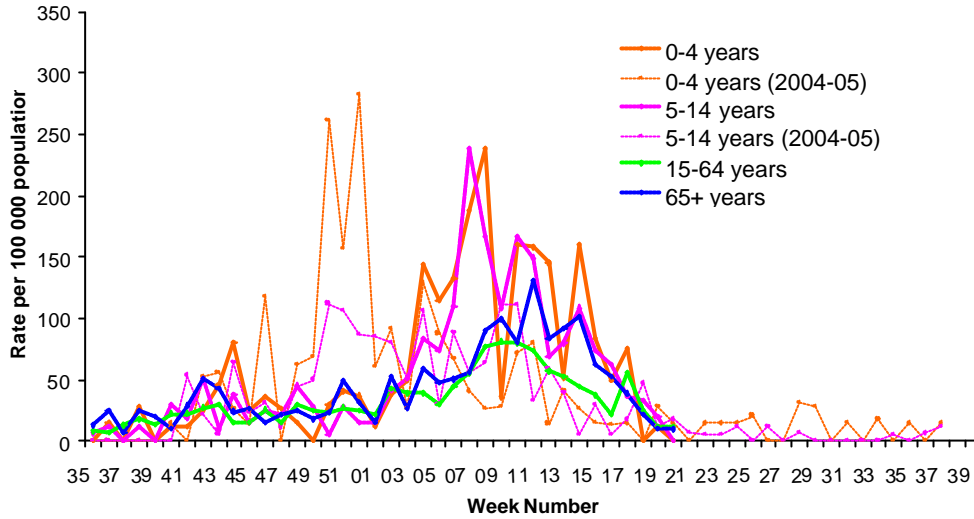
During 2005-06, a total of 34 cases of influenza infection were laboratory confirmed in patients registered with a sentinel GP practice; 3 were influenza A H3, 4 were influenza A (unsubtyped) and 27 were influenza B. This compares with 16 sentinel influenza detections during the 2004-05 season – when the majority were influenza A H3.

Forty-four sentinel swabs were also found positive for respiratory viruses other than influenza during 2005-06. Of these; 14 were positive for RSV, 14 for rhinovirus, 8 for adenovirus, 7 for coronavirus and one for metapneumovirus.

As in the two previous seasons school-age children were the group most affected by 'flu-like illness during winter 2005-06. Approximately half of all laboratory confirmed influenza B infections from sentinel sources occurred in this age-group. Figure 2 shows the combined age-specific rate for 'flu and 'flu-like illness in all four age groups.

Figure 2:

Age-specific rates of clinical 'flu and 'flu-like illness 2005-06

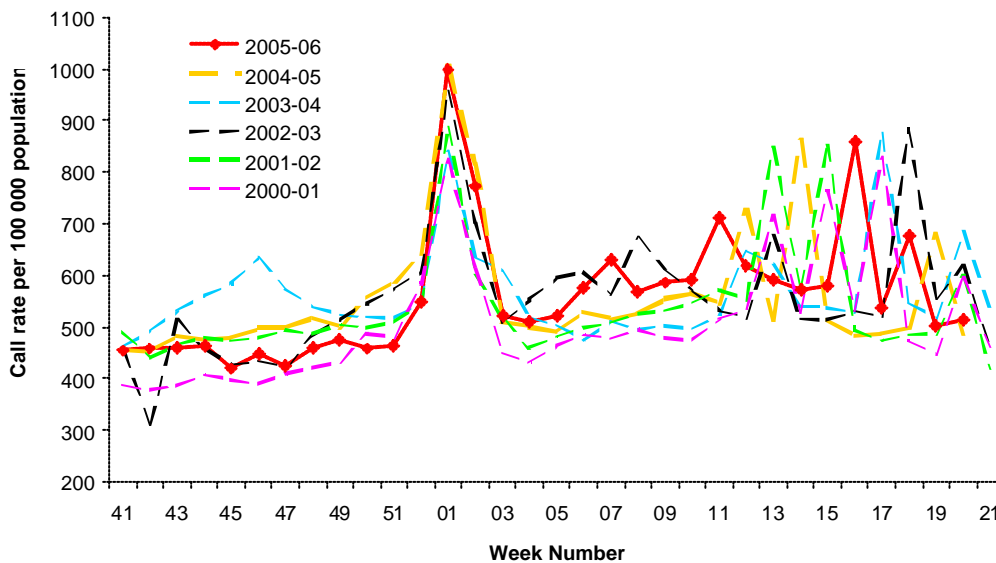


Out-of-Hours Centres

Once again, Co-Op call rate data for 2005-06 followed a very well-defined pattern throughout the period of surveillance, with peaks in call rates occurring during the holiday periods of Christmas/New Year, St Patrick's Day and Easter (Figure 3). Higher than normal rates were also recorded between Week 6 and Week 10 of 2006 – when influenza B activity in the community was at its highest.

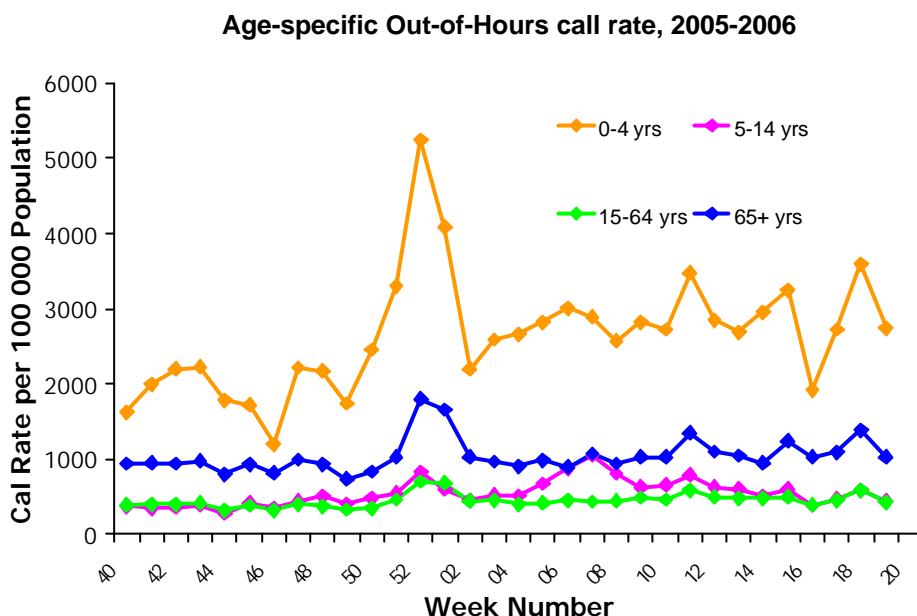
Figure 3:

Total calls to Out-of-Hours Centres in Northern Ireland



Examination of the age-specific data provided by two Out-of-Hours Centres also indicated that the highest call rates occurred in those aged 0-4 years (Figure 4). However, in the absence of coding, this observation cannot be attributed solely to respiratory disease.

Figure 4:



Virus activity in Northern Ireland

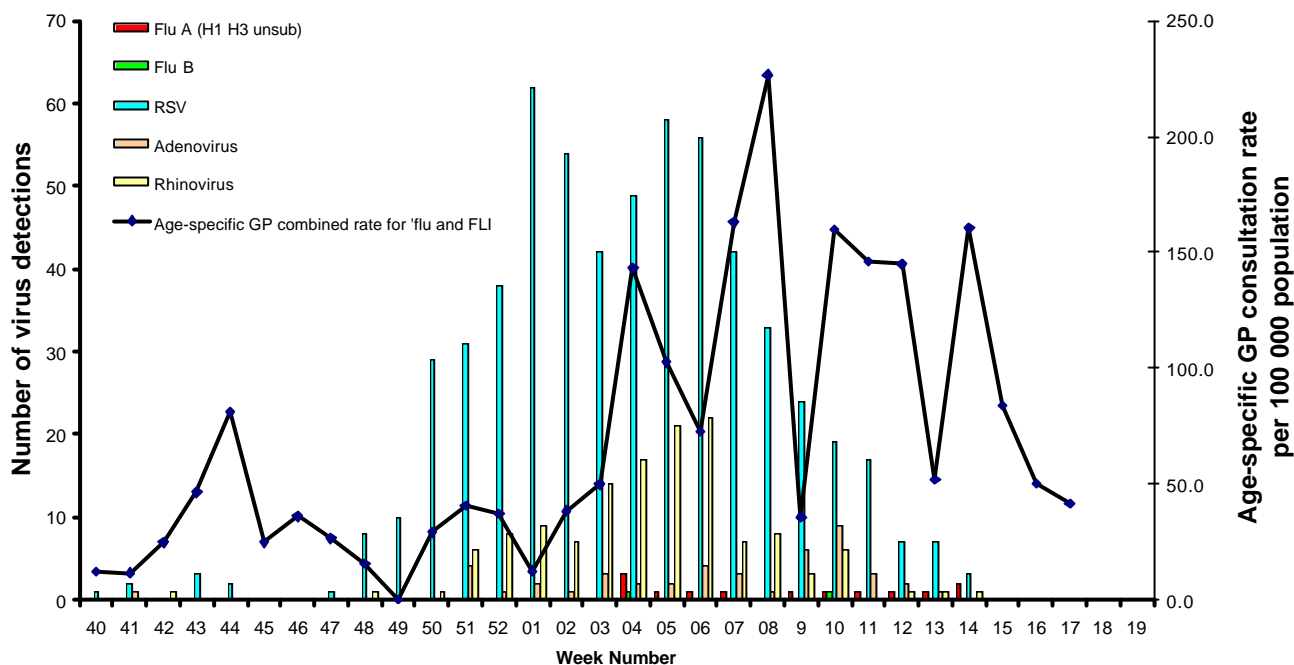
Influenza virus activity remained at normal winter levels during the 2005-06 season.

A total of 26 cases of influenza infection (3 influenza A H3, 14 influenza A untyped, plus 9 influenza B) were laboratory confirmed through routine testing during the season - the last in Week 18 of 2006. This compares to 58 confirmed cases during 2004-05 (28 influenza A H3, 12 influenza A H1, 13 influenza A untyped, plus 5 influenza B). The proportion of influenza B in hospitalised patients during 2005-06 was much lower than that recorded in community samples. This is not unexpected as influenza B is, generally, a less severe infection than influenza A and, thus, less likely to result in hospitalisation. Almost all influenza A detections confirmed during 2005-06 occurred in very young children.

Respiratory virus infections, other than influenza, were also laboratory confirmed in approximately 1000 individuals across Northern Ireland during the 2005-06 season. The majority of these were hospitalised patients and, of these, three-quarters were under one year of age. As expected, the main respiratory pathogens detected were RSV, Rhinovirus and Adenovirus (Figure 5).

Figure 5:

GP combined age-specific consultation rate versus respiratory virus detections, 0- 4 years, 2005-06



Influenza surveillance using sentinel community pharmacies

In association with the Pharmacy Group of DHSSPS, CDSC (NI) set up a pilot pharmacy surveillance project for the 2005-06 influenza season. The aim of this pilot was to assess the feasibility of surveillance for influenza-like illness by using over the counter medicine sales data. A single Northern Ireland chain, with 44 pharmacies and health stores situated throughout the Province, agreed to provide data for this pilot study.

Analysis of historical data (already provided by the company) enabled the development of statistical models to predict, week by week, over-the counter sales of paediatric cough, cold and antipyretic medicines (as a proportion of total sales). The results of the analysis suggested that, by monitoring the sales of these medications, the onset of the flu season could be detected one to two weeks before the sentinel GP system.

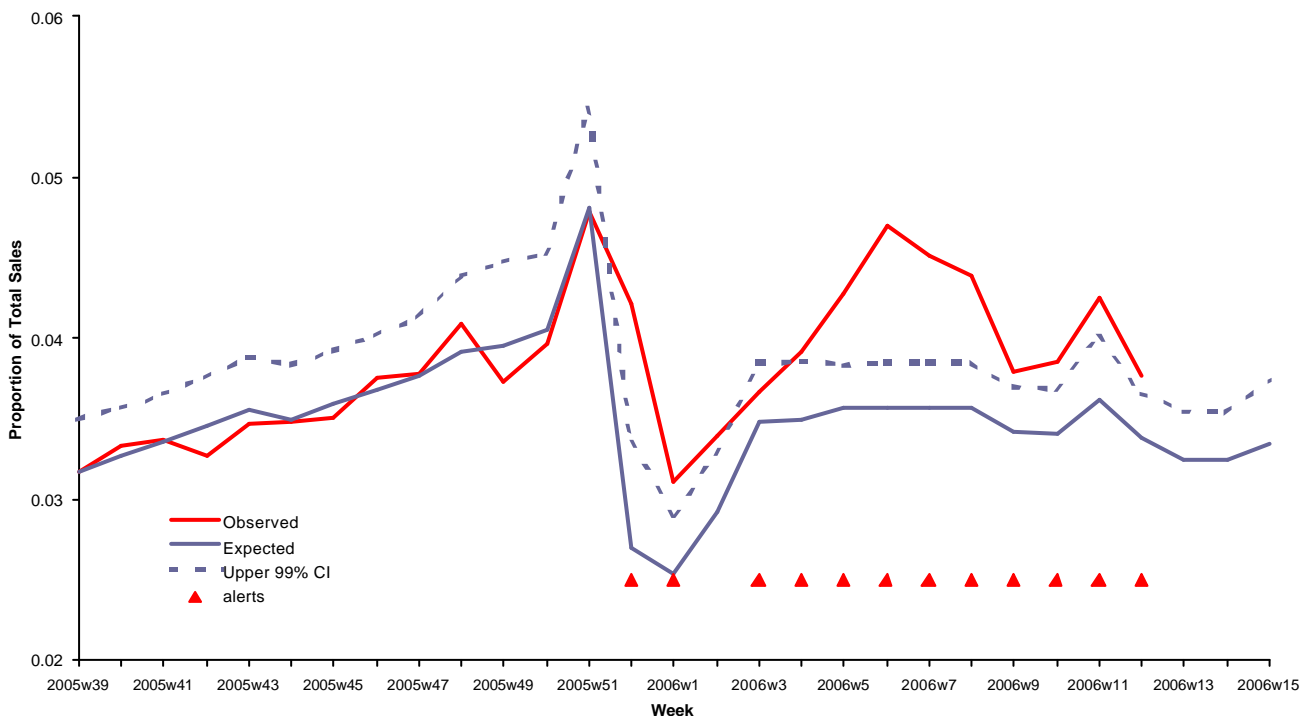
During the 2005-06, the Pharmacy Group sent sales data to CDSC (NI) each week. The sales data for a group of medications was then compared to the expected level of sales for that week. Alerts were generated if sales were significantly higher than expected.

The first alert of the season was generated in Week 52 of 2005; this was 2 weeks before the first laboratory confirmed detection of influenza virus in Northern Ireland and 2 weeks before the first significant increase in influenza-like illness rates recorded by the ESINI scheme (Figure 1). Alerts were generated for each of the following weeks during the season until the pilot ended in Week 12 (except Week 02 of 2006 when no data was available). The peak in sales of flu medicines was observed in Week 06 of 2006 (Figure 6).

The pharmacy chain also provided individual sales data for 11 sentinel pharmacies, to allow for analysis on a localised basis. This information was used to present data in the weekly reports. However, since baseline data was not available for individual pharmacies, this information was of limited usefulness.

This pilot has shown that pharmacy based surveillance can provide an additional warning of the onset of influenza epidemics. Besides its usefulness during regular influenza seasons, there are also potential applications during an Influenza pandemic and to monitor other, non-respiratory diseases. A full evaluation of the pilot is currently being carried out and this will be used to determine whether the system will become a routine surveillance project in Northern Ireland.

Figure 6: Proportion of sales of children’s cough and cold remedies, expected sales and 99% upper confidence interval

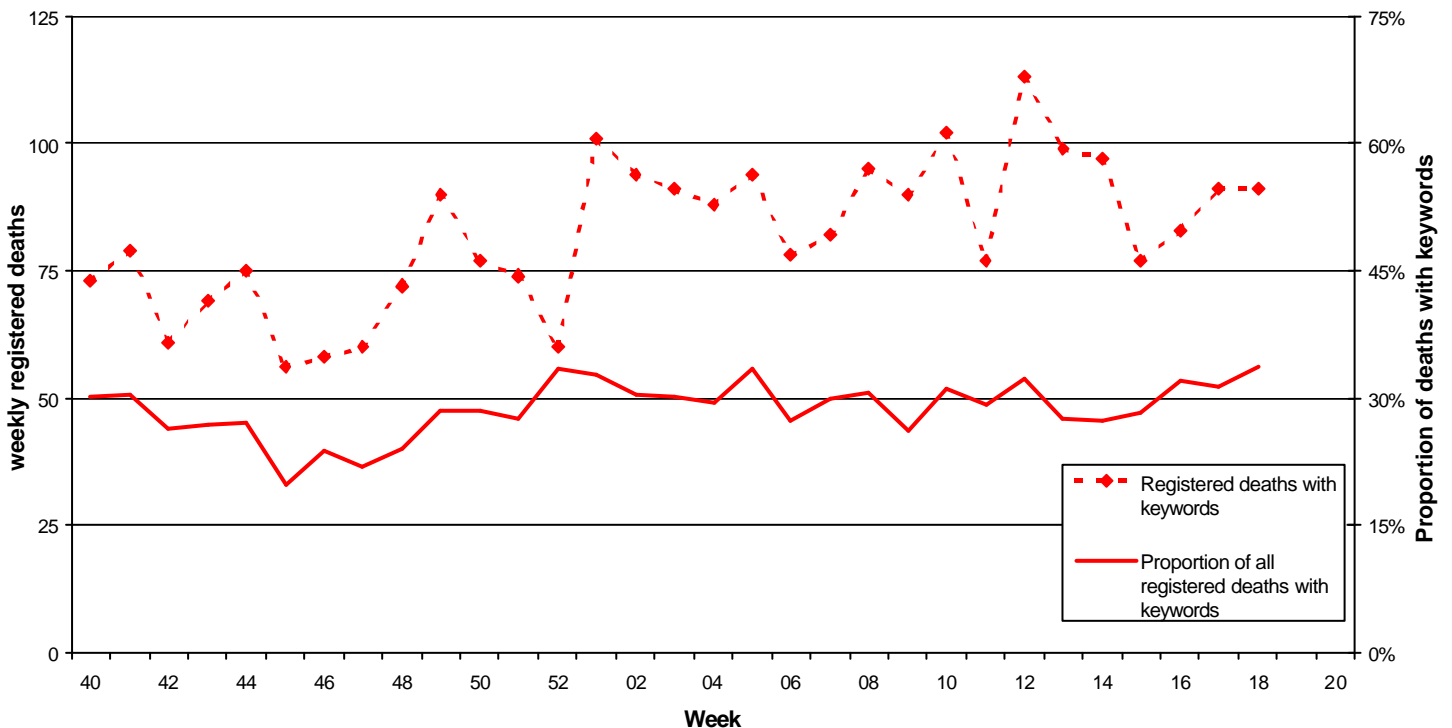


Weekly Mortality Data (NISRA)

During the 2005-06 season, NISRA provided the ESINI scheme with data relating to the number of deaths, which may be attributable to influenza or complications thereof, registered each week in Northern Ireland. Data were derived from a computer-based analysis of the cause of death on the civil death register. Searches were carried out using a number of keywords stated on death certificates (bronchiolitis, bronchitis, influenza and pneumonia). In addition, the proportion of *all* registered deaths in any given week with these keywords was also provided. Results are presented in Figure 7. The largest peak in death registrations (preceded by a trough) occurred during Week 01 of 2006. This was, almost certainly, due to a number of later-than-normal registrations as a result of Registrar Office closures over the Christmas and New Year holiday periods. Although the total *number* of deaths with these keywords varied from week to week throughout the season, the *proportion* of total deaths with these keywords varied little. Approximately one-third of all deaths registered in Northern Ireland between early October 2005 and mid-May 2006 were attributable to conditions associated with the selected keywords

Figure 7:

Deaths with flu keywords by week of registration, 2005-06



Flu surveillance elsewhere

England, Scotland, Wales and Republic of Ireland

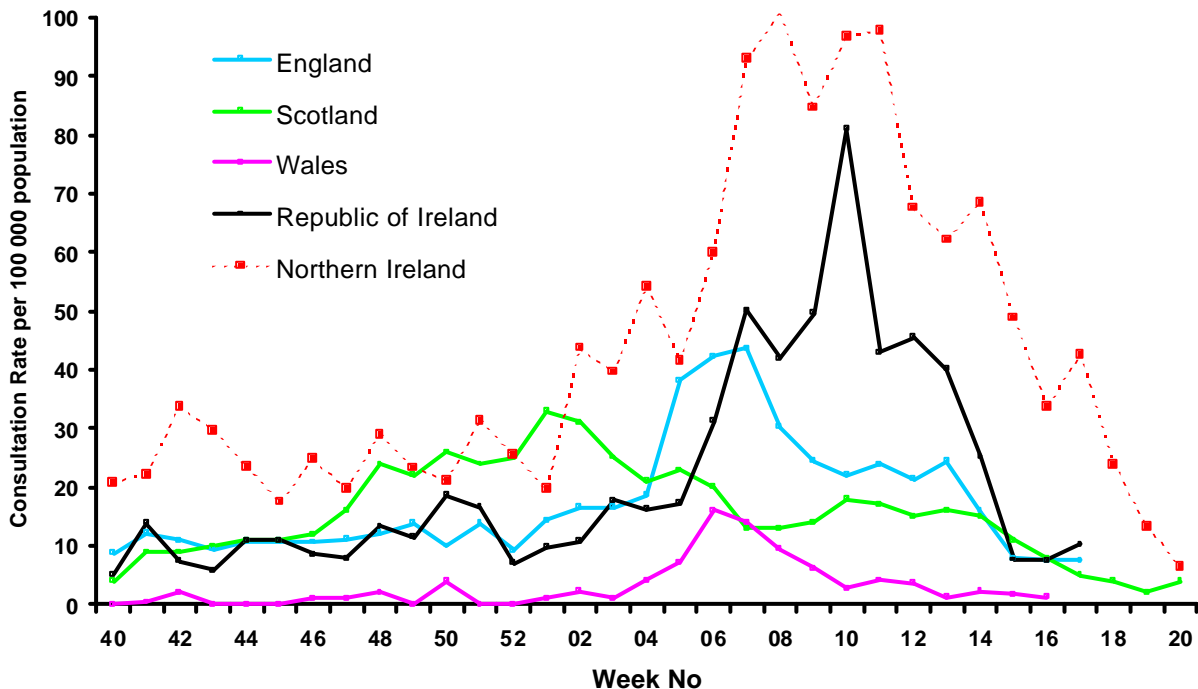
In 2005-06, RCGP and sentinel scheme consultation figures across much of the UK and RoI followed largely the same pattern as that seen in Northern Ireland (albeit at lower levels), with consultation rates in both England and Scotland taking longer than usual to return to low levels. As in previous years, consultation rates in Wales remained very low throughout the season (Figure 8).

Virological Surveillance England, Wales & Scotland

Between Week 40 and Week 04 of the 2005-06 season, there were a total of 956 PCR positive detections for influenza made from specimens referred to the Enteric Respiratory and Neurological Reference Laboratory (ERNVL) from England, Wales and Scotland. Of these, 209 were identified as influenza A H3, 95 as influenza A H1 and 652 as influenza B. During the same period, other NHS and HPA microbiology laboratories across England detected (by isolation, PCR, direct immunofluorescence or paired sera tests) a total of 150 influenza A infections and 386 influenza B infections. A summary of the 2005-06 season may be found at the HPA website: http://www.hpa.org.uk/infections/topics_az/influenza/seasonal/activity0506/flureport.htm

Figure 8:

GP consultation rates for 'flu and 'flu-like illness, UK and RoI, 2005-06 *



* Data extracted from HPA Weekly National Influenza Report (England, Wales & Scotland) and from Health Protection Surveillance Centre Report (Republic of Ireland)

School Outbreaks of Influenza (England & Wales)

During the 2005-06 season, the HPA Centre for Infections at Colindale received over 700 outbreak reports of 'flu-like illness across England & Wales. Almost all were reported from schools during January and February of 2006 and approximately 10% were laboratory confirmed as influenza B infection. A small number of outbreaks also occurred in nursing homes towards the end of the season – influenza A infection was laboratory confirmed as the cause of illness.

Virological Surveillance Republic of Ireland

A summary of the 2005-06 season will be published shortly on the HPSC website:
<http://www.ndsc.ie/A-Z/Respiratory/Influenza/Publications/20052006Season/>

CDSC (NI) would like to thank Sentinel GPs and their Practice Staff, Out-of-Hours Centres, Regional Virus Laboratory, Sentinel Community Pharmacies, DHSSPS Pharmacy Group, Dr Gianfranco Spiteri CDSC (NI), staff of the Northern Ireland Statistics and Research Agency (Dr Jos IJpelaar & Gillian Fegan) and Influenza Surveillance Centres throughout the UK and RoI for providing timely data over the past year. Without the co-operation of all concerned, the further development of enhanced surveillance of influenza in Northern Ireland would not be possible.