# VIROLOGY Quarterly report (July to September 2005)

RESPIRATORY VIRUSES

*Influenza virus*

Sentinel influenza surveillance started in April 2005, one month earlier than the usual start date of May. This was due to issues related to the vaccine, Vaxigrip, supplied by Sanofi-Pasteur. At the end of February 2005, the Ministry of Health's medicine regulatory body Medsafe was notified that one of the three vaccine components, A/Wellington/1/2004 (H3N2), contained only 10 micrograms per dose rather than the 15 micrograms per dose required. To source alternative vaccine suppliers with full-strength vaccine, the 2005 vaccination programme was delayed from March to mid-April. As a result, Ministry of Health requested the early start of sentinel influenza surveillance in order to monitor influenza activity closely.

For detailed information on influenza activity in 2005, please refer to the report: Sue Huang "recommendation for influenza vaccine composition 2006". Available at: http://www.surv.esr.cri.nz/virology/influenza_vaccine.php/.

In summary, influenza activity in 2005 was higher than 2004, but similar to 2003. It peaked in week 25 (18-24 June). A total of 837 influenza isolates were reported from January to September 2004, of these 734 were influenza B and 103 were influenza A. B/HongKong/330/2001-like strains and B/Shanghai/361/2002-like strains co-circulated with the B/HongKong lineage shown to be the predominant strain with 71.6% (541/756) of the influenza B isolates and 64.6% of total isolates (541/837) typed as B/HongKong/330/2001-like.

Year 2005 has recorded the largest influenza B outbreak ever reported since influenza surveillance began in 1992. The second and third largest influenza B outbreaks occurred in 1995 and 1997. New Zealand experienced an influenza B epidemic in school-aged children in the North Island in 2005. Influenza B isolations in the 5-19 age group are 4 to 6 times higher than those observed in 1995 and 1997. In addition, consultation rates for influenza like illness (ILI) are the highest in the under 19 age group and comprised >50% of all consultations for ILI. Furthermore, the epidemic has been associated with significant morbidity, as illustrated by reports in the media of significant school absenteeism. In some schools, particularly in Wellington and Auckland regions, school absenteeism reached more than 20% in June. One Wellington school was closed due to a high rate of respiratory illness.

During this epidemic, three children died from complications from influenza B/HongKong/330/2001 infections:

- A 7 year-old boy who developed Reye syndrome. This child was taking aspirin for another condition.
- An otherwise fit and well 16 year-old boy who developed _ Staphylococcus aureus_ pneumonia and septicemia.
- An otherwise fit and well 11 year-old boy who developed _ Staphylococcus aureus_ pneumonia and septicemia.

Due to vaccine breakthrough and/or failure in 2004, health professionals around the country raised the issue of surveying influenza vaccine breakthrough/failure. Virology laboratories, influenza coordinators in public health units, medical officers of health, general practitioners (GPs) and practice nurses in the Wellington region

were consulted in relation to this issue. During sentinel surveillance, GPs take swabs from 3 influenza-like-illness patients each week and fill in specimen request forms with necessary demographic information. The consensus was that in addition to the demographic information, an extra simple question should be asked: has the patient been vaccinated against influenza in the same year as the onset of ILI. GPs are required to tick a box (yes/no/unknown).

Influenza vaccination history provides the following important information:

- Virologically, an influenza virus isolated from a vaccinated person is an extremely valuable isolate. Full antigenic and genetic characterisation of the isolate could provide the drifting trend of the virus. It helps the selection of a vaccine strain.
- Epidemiologically, it gives some indication of the trend of vaccine failure/breakthrough. Sentinel surveillance provides relative constant pools of patients. Over a few years, the baseline for the vaccine breakthrough/failure can be built. Any activity higher than the baseline event can then be detected.

Results: 272 out of 958 ILI cases (28%) had information on vaccination history. Among them, 25 had influenza vaccination in the same year as the onset of ILI and 247 had none. There were 3 vaccinated patients whose specimens yielded influenza viruses (2 with influenza B/HongKong/330/2001-like viruses and 1 with B/Shanghai/361/2002-like virus). The antigenic analysis for B/Shanghai/361/2002-like virus isolated from the 23-year old vaccinee showed no drifting trend, i.e., the virus had the same titre compared with the homologous virus.

On 11 July 2005, an outbreak of influenza A at Metlifecare Coastal Villas in Paraparaumu was notified to Regional Public Health (RPH). The Coastal Villas is a 630-resident village with a 30-bed long-term care facility (LTCF, largely dementia cases) looked after by 30 staff. The outbreak was confined to the LTCF.

RPH interviewed 2 ill staff, and 5 ill residents whose illness history were provided by nurses as residents were too ill and/or dementia. These showed that symptoms were mainly respiratory and indicative of influenza. Nasopharyngeal swabs were obtained from 3 residents (subsequently 2 more swabs were obtained) and sent to National Influenza Centre in ESR. The causal agent was identified as Influenza A/California/7/2004 (H3N2) like – low reactor.

During the outbreak 11 residents and 7 staff became ill with influenza. Among them, two cases were laboratory-confirmed as influenza. One resident died of a complicating pneumonia. Duration of illness ranged from 2+ to 6+ days, with a median of 4+days. The first case was a staff member, an outlier with onset of symptoms on 25 June 2005. The next case was a resident with onset of symptoms on 5 July 2005. The last case was a resident with onset of symptoms on 13 July 2005. All resident cases were housed in one wing of the LTCF, apart from 1 case who mixed with other residents in the lounge.

RPH advised on use of Tamiflu as treatment for residents and prophylaxis for residents and staff. None of staff members was treated with Tamiflu due to rapid recovery but 22 staff members received Tamiflu as a prophylaxis. Four ill residents were treated with Tamiflu; 9 well residents were given Tamiflu as a prophylaxis. The

remaining was not treated being either post-illness or having refused the anti-viral drug. RPH also collected influenza vaccination histories. 20% of vaccinated residents became ill.

In summary, recommendation for influenza vaccine formulation for New Zealand in 2006 is:

- A(H1N1) an A/New Caledonia/20/99-like strain
- A(H3N2) an A/California/ 7/2004 - like strain
- B a B/Malaysia/2506/2004 - like strain

*Respiratory Syncytial Virus, Rhinoviruses and parainfluenza viruses*
During July to September 2005, 611 cases of respiratory syncytial virus were reported. This is higher compared with 477 cases of RSV infection during the same period in 2004. Thirty-five rhinoviruses were reported, which is a similar number compared to the 31 isolations during the same period in 2004. A significantly higher total of 96 parainfluenza viruses were reported this year compared to the 51 in 2004, with parainfluenza type 1 (2), type 2 (7) and type 3 (87).

ADENOVIRUSES AND ENTEROVIRUSES

*Adenoviruses*
During July to September 2005, a total of 91 adenoviruses were reported. This was higher than 72 adenovirus isolations during the same period in 2004. Adenovirus type 3 was the predominant serotype. A total of 83 adenoviruses were serotyped as adenovirus type 1 (5), type 2 (10), type 3 (39), type 4 (19), type 5 (2), type 8 (1), type 14 (1), type 37 (4), type 41 (1) and untypable (1).

*Enteroviruses*
During July to September 2005, a total of 67 enteroviruses were reported. This is a similar to the 63 enterovirus isolations during the same period of 2004. Coxsackie A16 was the predominant serotype. A total of 39 enteroviruses were serotyped as Coxsackie B1 (4), Coxsackie B3 (2), Coxsackie A16 (21), Echovirus 9 (2), Echovirus 25 (4), Echovirus 27 (1), Echovirus 30 (4) and Poliovirus type 1 sabin-like (1).