



# An Outbreak of Influenza B at a Chronic Care Psychogeriatric Hospital

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## Introduction

Influenza A and B outbreaks are a major source of serious illness, hospitalisation and death in elderly persons. Outbreaks in aged care facilities have resulted in attack rates of 10% to 70%<sup>1,2</sup>, with up to 55% of ill residents requiring hospitalisation or as many as 30% dying from complications<sup>3-6</sup>. In late July, the Director of a 90 bed hospital reported an influenza-like illness among residents. The hospital, located in Western Sydney, NSW, comprised of aged care, psycho-geriatric and Huntington wards and at the time of the outbreak, the home's resident population was 89, with 170 staff members. A coordinated response was undertaken by the Western Sydney Public Health Unit and the National Centre for Immunisation Research and Surveillance (NCIRS) initially to determine the cause of illness and to design control measures.

## Aim

We conducted a study into this outbreak to determine its cause and extent, the vaccination coverage of the population and the effect of providing residents of the institution with preventative antiviral therapy

## Method

❖ ILI cases were defined using the following criteria: any residents or staff members with fever plus at least two of the following symptoms: cough, rigor (shakes) or chill, prostration and weakness, myalgia or widespread aches and pains, redness of the nasal mucosa and throat with onset on or after 27, July, 2005.

❖ Information was collected from residents and staff who met the case definition, using a standard data collection tool. Data collected for residents revealed the basic demographics, date of onset of respiratory symptoms, the presence of dementia, Huntingtons disease or other psycho-geriatric diseases, influenza vaccination history and other medical conditions.

❖ Information was also collected from staff about their type of employment, hygiene practice and whether they go to work while being sick.

❖ Data collected were entered and analysed using Epi-info (version 3.3.2), with a P value of less than .05 being used to indicate statistical significance. Transmission/attack rates were also calculated. Vaccine effectiveness was calculated using the formula  $VE = (ARU - ARV) / ARU$

❖ Specimens for laboratory testing (nasopharyngeal swabs) were taken on two occasions:  
1. The Public Health Unit initially collected them from symptomatic residents (29/07/05)

2. NCIRS took swabs from all residents in four out of the five units and also from staff members present at the time of collection (04/08/07)  
These were examined by Virology Department, Institute of Clinical Pathology and Medical Research, Westmead, NSW.

## Results

### Epidemiological investigation

#### a) Residents

At the time the facility had 89 residents including 40 males and 49 females who resided in single rooms between five different units. The median age of the residents was 78.3 years (range: 35 to 98 years). Residents from all units dined mostly in communal dining areas within their own centre.

❖ Unit 1, 2 and 3 respectively cared for residents with Huntington's disease, low care dementia and other psycho-geriatric conditions. These three units were entirely confined and had no access to the rest of the centre. Unit 4 and 5 were located in the same building but on separate levels and both accommodated frail-aged residents. Residents in these units were free to leave their unit, however many of the residents were immobile or required high level of care. Questionnaires were completed for 59 of the 89 residents (66%)

b) Staff: There were 170 staff working at the facility (permanent, casual, agency). Out of this, only 23 members completed the questionnaire

### Epidemiological Results

a) Residents and Staff: Twenty-two (25%) out of the 89 residents met the definition for ILI. Onset of illness occurred between 29 July, 2005 and 5 August, 2005, with a peak of 17 case-residents occurring between the 31 July to 3 August. The attack rates (AR) in case-residents were highest in units 1 and 2 and lowest in unit 3 (50%, 41% and 9% respectively). The AR in vaccinated was 17.7% and in unvaccinated, 33%. The VE of influenza vaccine was 49%. Antivirals were commenced on 6 August, 2005. Out of the 89 residents, 86.5% (77/89) were given Oseltamivir prophylaxis and 10.1% (9/89) were actively treated. 6 residents were tested positive from NP swabs for influenza B infection. There were no cases of hospitalisation or death among the residents. No staff members met the ILI criteria.

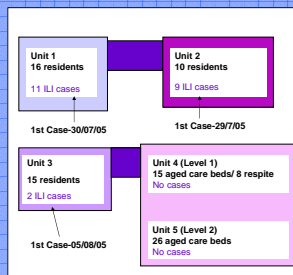


Figure 4: Layout of the hospital and timeline of events

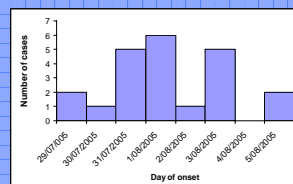


Figure 2: Epidemic Curve for residents with ILI

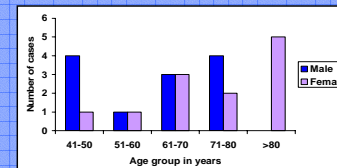


Figure 3: Age and sex distribution of cases meeting ILI definition

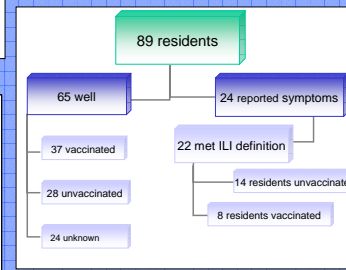


Figure 4: Vaccination history of residents

## Discussion

- We demonstrated nearly 50% effectiveness of the vaccine in this frail, institutionalised population. Influenza vaccination is recommended by the Australian government and is free to anyone over the aged of 65 years<sup>7</sup>
- Only 38% of interviewed residents (58/89) were vaccinated against influenza, with the attack rate double in unvaccinated residents.
- Of the ACF residents who met our ILI case definition and were >65 years old, less than half were vaccinated before the outbreak
- Previous studies have suggested that high influenza attack rates are correlated with low vaccination coverage of the residents<sup>8,9</sup>
- Conversely, other studies have shown that in order to prevent outbreaks occurring, it is not sufficient enough to just vaccinate residents alone (even with a coverage rate of above 98%)<sup>8,9</sup>
- Strong evidence suggests the efficacy of actively vaccinating care home staff in reducing influenza related outcomes amongst residents and in preventing the incidence of outbreaks<sup>10</sup>
- It has been estimated that in Australia the uptake of influenza vaccination by care home workers is less than 30%<sup>11</sup>
- In this outbreak, Oseltamivir (Tamiflu) was introduced to the facility 8 days after the first ILI case had occurred and had an impact in curtailing the outbreak.
- Experimental data has shown that Tamiflu if given within the first 36 to 48 hours after onset of ILI, alleviates major symptoms by 1.5 to 3 days<sup>12</sup>
- In Australia there were few published reports of the use of Oseltamivir for prophylaxis during influenza B outbreaks among institutionalised residents<sup>13</sup>
- During outbreaks of influenza in closed settings such as this, prophylaxis should be considered for all employees and residents, regardless of their vaccination status<sup>14</sup>

## Conclusions

We describe an outbreak of influenza B in a psychogeriatric hospital which was controlled by used of oseltamivir prophylaxis and treatment. Vaccine effectiveness appeared to be reasonable, but residents were under-vaccinated. Data on the effectiveness of oseltamivir in influenza B and in elderly people are scarce, so this outbreak provides useful information. This outbreak suggests that oseltamivir is effective in controlling influenza B outbreaks, and highlights the importance of yearly vaccinations for not only residents but also health care workers, as they may also introduce and sustain outbreaks of influenza.

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