

# An outbreak of measles in Adelaide

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Sporadic outbreaks of measles continue to occur throughout Australia that require considerable expenditure of time and resources to control.<sup>1-6</sup> We report an outbreak investigation by the Communicable Disease Control Branch (CDCB), Department of Health, South Australia in late 2003 that utilised methods and identified issues that may be relevant to future investigations of measles outbreaks.

Measles cases were defined in accordance with the *Interim Surveillance Case Definitions for the Australian National Notifiable Diseases Surveillance System*.<sup>7</sup> A confirmed case was a case that had laboratory definitive evidence, or clinical evidence and epidemiological evidence. The *Guidelines for the control of measles outbreaks in Australia* was used in the investigation of this outbreak.<sup>8</sup> Later in the outbreak, the CDCB provided advice to general practitioner surgeries and hospital emergency departments so that contact tracing for potential exposures in these settings could be managed by the institutions themselves.

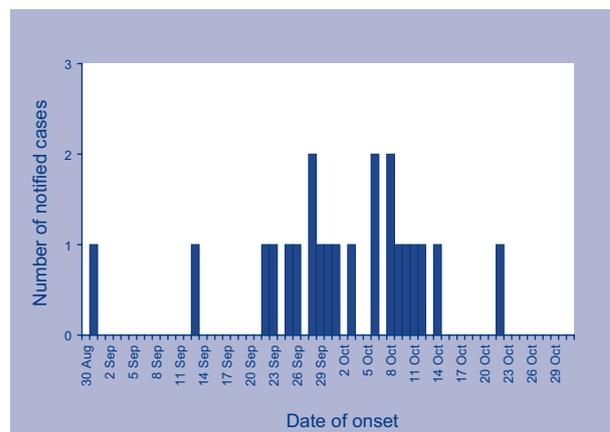
The index case, a 22-year-old male, was notified to the CDCB on 20 September 2003 following rash onset on 17 September and positive IgM serology. During his infectious period the case worked at a supermarket, attended a concert at a hotel, visited several retail outlets and spent time in a hospital emergency department.

The index case acquired his infection from a 19-year-old female Adelaide resident who had travelled in New Zealand from 9 to 19 August 2003. On 3 September she presented to her local GP with a rash, fever and sore throat. A diagnosis of viral infection was made and a specimen taken for measles, rubella and cytomegalovirus serology at a private pathology laboratory. Measles serology was IgM equivocal and IgG negative. The laboratory recommended repeat testing and additional specimens were taken on 15 September that were IgM and IgG positive for measles. The GP notified the results on 22 September, no laboratory notification was received by the CDCB. During her infectious period, the case had worked at the same supermarket as the index case.

A further 20 cases with dates of onset between 26 September and 22 October were notified in the following four weeks (Figure 1). All cases were confirmed by both laboratory definitive evidence, and by clinical and epidemiological evidence. Four cases, both in workers and customers, resulted from exposures in supermarkets. The index case was also responsible for infecting seven others at a concert in a popular hotel, including a bartender who in turn exposed four patrons at the same venue when she became infectious two weeks later. One of the hotel patrons infected by the bartender was a hospital cleaner who worked in the labour and delivery ward at a major hospital while infectious but did not transmit the virus to any others. Additional settings where transmission occurred included a hospital emergency department and ward, a shopping centre and among family members (Figure 2).

For the 21 cases where the exposure was known, the median incubation period was 12 days (range 8 to 17 days). The median age of cases was 23 years (range 9 months to 36 years). Fifteen cases (68%) were aged between 22 and 36 years, one was aged 9 months and another two years. Two cases were hospitalised. Thirteen cases (60%) were not vaccinated and another six (27%) had documented epi-

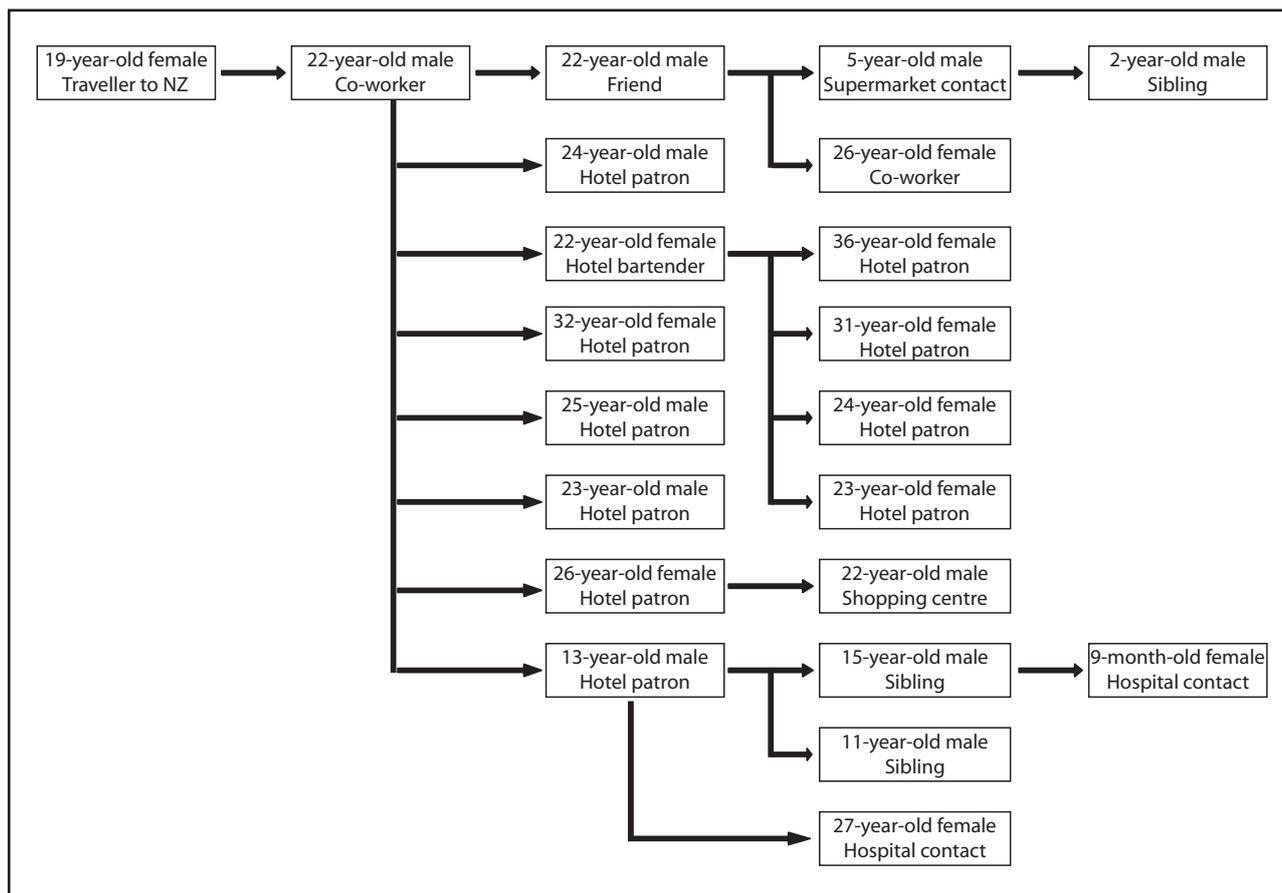
**Figure 1. Notifications of confirmed measles, Adelaide, August to October 2003, by date of onset**



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Figure 2. Schema of measles outbreak in Adelaide



dence of receipt of one dose of measles-containing vaccine. Among the seven cases born since 1982, two were conscientious objectors and the remainder were not vaccinated.

As per the national guidelines, approximately 3,060 contacts were followed up indirectly. Twenty-four workplaces or social organisations and one school distributed measles information letters. Contact tracing was done by seven GP surgeries and three hospital infection control departments. A total of 782 contacts were followed up directly by the CDCB, including all passengers of an interstate flight on which a case had travelled during her infectious period. Among the contacts followed up directly, 20 were advised to have measles vaccination and 35 to have normal human immunoglobulin (NHIG).

Five contacts (or their parent/s) who received information about measles (symptoms and appropriate isolation if symptoms developed) became cases; two transmitted measles to others. One transmitted measles to a co-worker and a customer in a supermarket, and the other infected a hospital contact as he was admitted to a ward on the same floor from which that person was being discharged.

A number of important lessons have emerged from this outbreak investigation. Firstly, management of measles cases in healthcare settings is an important aspect of measles control,<sup>6,9</sup> highlighted in this outbreak by two cases who acquired their infections in hospitals. Furthermore, neonates were placed at risk by a cleaner who worked during her infectious period. Ongoing vigilance in healthcare settings, particularly in hospitals, is needed to ensure that staff are fully vaccinated and suspected cases are properly managed to prevent the infection of others who are vulnerable.

The investigation identified a discrepancy between the *Australian Immunisation Handbook* (8th edition) and the national guidelines on recommendation of NHIG. The handbook states that NHIG is not required if the person has received one or more measles-containing vaccines, whereas the guidelines say those who are susceptible (which includes individuals over four years of age and born since 1966 with documented evidence of only one measles vaccination) should be advised to get NHIG. The CDCB recommended NHIG as specified by the guidelines.

Delegation of contact tracing for cases of measles in GP surgeries and hospitals to the institutions themselves was an effective way of easing the burden on investigators and engaging others in the public health response. Strict adherence to the national guidelines, especially contact tracing, during outbreaks is time consuming and frequently compromises other routine disease surveillance and investigation activities. It is also difficult to address all control measures in the guidelines for every case when a large number of cases are being followed up.

The investigation also prompted debate about the effectiveness of contact tracing for potential measles exposures on aircraft. One study indicated that the risk of measles transmission after an exposure on an international flight was low.<sup>10</sup> However, the risk of transmission on each flight is likely to be different due to multiple factors including the age profile of passengers, how far from the case susceptible persons are sitting, the extent and effectiveness of air circulation and filtration systems within the cabin and the extent of sharing of restricted spaces such as toilets. National consensus on this issue is particularly important given its multi-jurisdictional nature.

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