Introduction

* Pertussis remains endemic in Australia despite a long history of routine immunisation.
* There have been important changes in the national immunisation program during the last decade.

Methods

* Pertussis cases notified to the National Notifiable Diseases Surveillance System with a diagnosis date between 1st January 1995 and 31st December 2005.
* Rates calculated using Australian Bureau of Statistics estimated resident populations.
* Incidence rate ratios were calculated to compare annual notification rates to state averages.

Results

National and state incidence

* There were 75,458 notifications nationally between 1995 and 2005, with an average annual rate of 39.6 per 100,000 population. The annual notification rate ranged from 23.1 - 58.1 per 100,000 population.
* A seasonal pattern could be observed, with peak notifications in spring.
* 62% of cases occurred in New South Wales and Queensland, and the highest average annual notification rate was in South Australia (63.9 per 100,000 population).
* All states and territories have had incidence rates higher than the average annual notification rate.
* Pertussis remains the most common vaccine preventable disease in Australia.

* Immunisation coverage estimates have increased during this period.

Conclusions

* Pertussis remains the most common vaccine preventable disease in Australia.
* There are regional differences in epidemic patterns by magnitude and inter-epidemic period. Differences among states and territories in terms of case ascertainment and notification rates may be a result of variation in the use and availability of diagnostic tests.
* Age-specific patterns of notification have reflected changes in vaccination practice, with successive falls by age group (eg. in 5-9 year olds after introducing the pre-school dose).
* Despite successive falls by age group, the total number of notifications has not changed, with upward trends in older age groups not targeted for immunisation.
* The increasing adult burden of pertussis raises new issues and challenges for diagnosis and potential immunisation strategies
* - diagnosis occurs by serology, but the available serological test may not have low specificity without adequate follow-up of cases and after adult dTpa immunisation.
* - children less than 6 months of age had the highest annual notification rate in all of the analysed years, with an average annual notification rate of 147 cases per 100,000 population (Figure 2).
* High notification rates occurred among children aged 5-9 years at the beginning of the decade, however there has been a dramatic decline, from a peak of 194 cases per 100,000 population in 1997 to less than 50 cases per 100,000 population since 1999.
* The notification rates for the 20-59 and 60 years and over age groups have recently risen to record highs and the majority of cases from year to year are now in the adult population.
* The age distribution of cases varies among states and territories

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* All states and territories have had incidence rates higher than the average annual national notification rate.
* The magnitude and pattern of epidemics varied greatly at the regional level (Figure 1). Epidemic cycles in New South Wales, Queensland and South Australia have followed a similar pattern, whereas epidemics in less populated and/or geographically isolated states and territories such as Western Australia, the Northern Territory and Tasmania, have been spaced further apart.

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Figure 1. Pertussis notification patterns in Australian states and territories, between 1995 and 2005. Note the scales vary between jurisdictions.