Vaccine Preventable Diseases in Australia, 2005 to 2007

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National Centre for Immunisation Research and Surveillance of Vaccine Preventable Diseases
Methods – Data sources and limitations (1)

- **Notifications**: National Notifiable Diseases Surveillance System
  - Updated data period: January 2006 to December 2007 (2 years)
  - By the ‘date of diagnosis’
    - the earliest date among the dates of onset, specimen collection, notification, or receipt of notification
  - Notified case as per national notifiable diseases case definitions
  - Possible under-reporting and variations due to
    - different reporting requirements and mechanisms in different jurisdictions
    - different thresholds for diagnostic testing
Methods – Data sources and limitations (2)

- **Hospitalisations**: AIHW National Hospital Morbidity Database
  - Updated data period: **July 2005 to June 2007** (2 years)
  - By the ‘date of separation’ of each episode of hospitalisation
    - Exception: by ‘date of admission’ for seasonal trends graphs
  - Separation diagnosis **coded** according to ICD-10-AM
  - ‘Any recorded diagnosis’ for most analyses;
    - ‘Principal diagnosis’ for specified analyses
  - Proxy ICD code or combinations used for some diseases of interest
    - e.g. for invasive *Haemophilus influenzae* type b or pneumococcal diseases
  - Note: one record for each hospitalisation episode
    - re-admission or inter-hospital transfer would generate additional records
  - Potential variations in access to hospitals and admission policies
Methods – Data sources and limitations (3)

- **Deaths**: AIHW National Mortality Database
  - Updated data period: January 2005 to December 2006 (2 years)
  - By the ‘date of registration’ rather than by date of death
  - Data from Registrars of Births, Deaths and Marriages in each state and territory, via the Australian Bureau of Statistics
  - Underlying cause of death **coded** according to ICD-10
  - ‘Underlying cause of death’ only
    - the single disease that initiated the train of morbid events leading directly to death
    - deaths where the disease of interest was a contributing cause of death are not included

- **Rate denominator**
  - Corresponding mid-year ABS estimated population

- Case definitions: please refer to individual disease chapters of the report
- Note: Data from these three sources are not linked
  - limited information on hospitalisation and death in notification data
    - described in the report text but not on graphs or tables
Vaccine preventable diseases in Australia, 2005 to 2007

Figures
Figure 3.2.1: Invasive *Haemophilus influenzae* type b disease notifications and *Haemophilus* meningitis hospitalisations for all ages, Australia, 1993 to 2007,* by month of diagnosis or admission

*Notifications – diagnosis between January 1993 and December 2007*

*Hospitalisations – admission between July 1993 and June 2007*
Figure 3.2.2: Invasive *Haemophilus influenzae* type b disease notifications and *Haemophilus* meningitis hospitalisation rates and number of deaths† for children aged 0–4 years, Australia, 1993 to 2007*

*Fully funded national Hib immunisation program commenced in July 1993*

![Graph showing the decline in Haemophilus meningitis deaths, invasive Hib disease notification rate, and hospitalisation rate from 1993 to 2007.](image)

*Notifications – diagnosis between January 1993 and December 2007*

*Hospitalisations – separation between July 1993 and June 2007*

*Deaths – recorded between January 1993 and December 2006*

†Hospitalisations and deaths coded as *Haemophilus* meningitis for the period up to June 2007 (hospitalisations) and December 2006 (deaths)
Figure 3.3.1: Hepatitis A notifications and hospitalisations, Australia, 1993 to 2007,* by month of diagnosis or admission

* Notifications – diagnosis between January 1993 and December 2007
Hospitalisations – separation between July 1993 and June 2007
Figure 3.3.2: Hepatitis A notification rates, Australia, 1993 to 2007,* by age group, sex and year of diagnosis

* Notifications – diagnosis between January 1993 and December 2007
Figure 3.3.3: Hepatitis A hospitalisation rates, Australia, 1993/1994 to 2006/2007,* by age group, sex and year of separation

* Hospitalisations – separation between July 1993 and June 2007
Figure 3.3.4: Hepatitis A notification rates, Australia,* 2006 to 2007, and hospitalisation rates, 2005/2006 to 2006/2007, by age group

* Notifications – diagnosis between January 2006 and December 2007
Hospitalisations – separation between July 2005 and June 2007
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* Notifications – diagnosis between January 2006 and December 2007
† Notifications – diagnosis between January 2003 and December 2005
Figure 3.4.1: Acute hepatitis B notifications, and hospitalisations with a principal diagnosis of acute hepatitis B, Australia, 1996 to 2007,*† by month of diagnosis or admission

* Notifications – diagnosis between January 1996 and December 2007
Hospitalisations – admission between January 1996 and December 2007
† This figure includes data from 1996 onwards when hepatitis B became notifiable.
Figure 3.4.2: Acute hepatitis B notification rates, Australia, 1996 to 2007, * by age group and year of diagnosis

* Notifications – diagnosis between January 1996 and December 2007
Figure 3.4.3: Acute hepatitis B hospitalisation rates, Australia, 2005/2006 to 2006/2007,* by age group and sex

Hospitalisations per 100,000 population

Age group (years)

* Hospitalisations – principal diagnosis and date of separation between July 2005 and December 2007
Figure 3.5.1: Influenza notifications and hospitalisations,* Australia, 1993 to 2007, by month of diagnosis or admission

* Notifications – diagnosis between January 2001 and December 2007
Hospitalisations – admission between July 1993 and June 2007
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* Notifications – diagnosis between January 2006 and December 2007
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* Notifications – diagnosis between January 2002 and December 2007
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* Notifications – diagnosis between January 1993 and December 2007
Hospitalisations – admission between July 1993 and June 2007
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* Notifications – diagnosis between January 1999 and December 2007
Figure 3.6.3: Measles hospitalisation rates, Australia, 1998/1999 to 2006/2007*, by age group and year of separation

* Hospitalisations – separation between July 1998 and June 2007
Figure 3.7.1: Meningococcal notifications and hospitalisations, Australia, 1993 to 2007,* by month of diagnosis or admission

* Notifications – diagnosis between January 1993 and December 2007
Hospitalisations – admission between July 1993 and June 2007
Figure 3.7.2: Meningococcal disease notification and death rates, Australia, 2005 to 2007,* by age group

* Notifications – diagnosis between January 2006 and December 2007
Deaths – recorded between January 2005 and December 2006
Figure 3.7.3: Meningococcal disease hospitalisation rates, Australia, 2005/2006 to 2006/2007,* by age group

* Hospitalisations – separation between July 2005 and June 2007
Figure 3.7.4: Meningococcal disease notifications, Australia, 1991 to 2007, by serogroup and year of diagnosis

The graph shows the number of meningococcal disease notifications in Australia from 1991 to 2007, categorized by year of diagnosis and serogroup. The data includes:

- Total notifications
- Serogroup not recorded
- Serogroup B
- Serogroup C
- Other serogroup

The graph indicates a trend of increasing notifications from 1991 to 2002, with a peak in 2002, followed by a decline in subsequent years.
Figure 3.7.5(a): Meningococcal serogroup C disease notification rates, Australia, 1999 to 2007, by age group* and year of diagnosis

* Age groups included in meningococcal C vaccination program from 1 January 2003. Cases aged 20–24 years in 2007 included those who were born during or after 1984 and were eligible for vaccination in the national meningococcal C vaccination program.
Figure 3.7.5(b): Meningococcal serogroup C disease notification rates, Australia, 1999 to 2007, by age group* and year of diagnosis

* Other age groups not included in Meningococcal C vaccination program
Figure 3.7.6: Meningococcal disease notification rates, Australia, 2006 to 2007,* by state or territory and serogroup

* Notifications – diagnosis between January 2006 and December 2007
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* Notifications – diagnosis between January 2006 and December 2007
† Notifications – diagnosis between January 2002 and December 2002
Figure 3.8.1: Mumps notifications and hospitalisations, Australia,* 1993 to 2007,† by month of diagnosis or admission

* Mumps was not notifiable in all states and territories until July 1996, and was not notifiable in Queensland from July 1999 to June 2001. Mumps was notifiable for the entire period only in ACT, NSW and Victoria.

† Notifications – diagnosis between January 1993 and December 2007
Hospitalisations – admission between July 1993 and June 2007
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* Notifications – diagnosis between January 1999 and December 2007
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* Hospitalisations – separation between July 1998 and June 2007

Hospitalisations per 100,000 population

Year of separation

0-4 yrs, 5-14 yrs, 15-24 yrs, 25-34 yrs, ≥35 yrs
Figure 3.9.1: Pertussis notifications and hospitalisations, Australia, 1995 to 2007,* by month of diagnosis or admission

Note varying scales between notifications and hospitalisations

* Notifications – diagnosis between January 1995 and December 2007
Hospitalisations – admission between January 1995 and June 2007
Figure 3.9.2: Pertussis notification rates, Australia, 1993 to 2007,* by age group and year of diagnosis

* Notifications – diagnosis between January 1993 and December 2007
Figure 3.9.3: Pertussis hospitalisation rates, Australia, 1993/1994 to 2006/2007,* by age group and year of separation

Hospitalisations per 100,000 population

Year of separation

* Hospitalisations – separation between January 1993 and June 2007
Figure 3.9.4: Pertussis hospitalisation rates, Australia, 1993/1994 to 2006/2007*, by age group (excluding <1 year) and year of separation

* Hospitalisations – separation between July 1993 and June 2007
Figure 3.10.1: Pneumococcal disease notifications and hospitalisations, Australia, 1998 to 2007,* by month of diagnosis or admission

* Notifications – diagnosis between January 2001 and December 2007
Hospitalisations – admission between July 1998 and June 2007 and include pneumonia, meningitis and septicaemia
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* Notifications – diagnosis between January 2002 and December 2007
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* Hospitalisations – separation between July 2005 and June 2007
Figure 3.10.4: Notification rates of invasive pneumococcal disease with serotypes contained in the 7-valent pneumococcal conjugate vaccine (7vPCV),* versus notification rates for other non-7-valent serotypes,† Australia, 2006–2007 compared with 2002–2004, by age group

* Serotypes contained in 7-valent pneumococcal conjugate vaccine: 4, 6B, 9V, 14, 18C, 19F, 23F
† All IPD cases with known serotypes and age caused by serotypes not contained in 7-valent pneumococcal conjugate vaccine
Figure 3.12.1: Q Fever notifications and hospitalisations, Australia, 1993 to 2007,* by month of diagnosis or admission

* Notifications – diagnosis between January 1993 and December 2007
Hospitalisations – admission between July 1993 and June 2007
Figure 3.12.2: Q fever notifications and hospitalisations, Australia, for the most recent 4 years,* by month of the year

* Notifications – diagnosis between January 2004 and December 2007
Hospitalisations – admission between July 2003 and June 2007
Figure 3.12.3: Q fever notification rates, Australia, 1993 to 2007,* by age group, sex and year of diagnosis

* Notifications – diagnosis between January 1993 and December 2007
Figure 3.12.4: Q fever hospitalisation rates, Australia, 1993/1994 to 2006/2007,* by age group, sex and year of separation

* Hospitalisations – separation between July 1993 and June 2007
Figure 3.12.5: Median age of Q fever notifications and hospitalisations, Australia, 1993 to 2007,* by sex and year of diagnosis or separation

* Notifications – diagnosis between January 1993 and December 2007
Hospitalisations – separation between July 1998 and June 2007
Data for each financial year plotted according to year in which financial year began
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* Notifications – diagnosis between January 2002 and December 2007
   Hospitalisations – separation between July 2002 and June 2007
Figure 3.13.1: Rotavirus hospitalisations, Australia, 1993/1994 to 2006/2007, * by month of admission

* Hospitalisations – admission between July 1993 and June 2007
Figure 3.13.2: Rotavirus hospitalisation rates, Australia, 1998/1999 to 2006/2007,* by age group (<5 years) and year of separation

Hospitalisations per 100,000 population

Year of separation

* Hospitalisations – separation between July 1998 and June 2007 where rotavirus recorded as either principal or any other diagnosis
Figure 3.13.3: Rotavirus notification rates, the Northern Territory, 2006 and 2007,* by age group (<5 years)

* Notifications – diagnosis between January 20056 and December 2007
Figure 3.14.1: Rubella notifications and hospitalisations, Australia, 1993 to 2007,* by month of diagnosis or admission

Note varying scales between notifications and hospitalisations

* Notifications – diagnosis between January 1993 and December 2007
Hospitalisations – admission between July 1993 and June 2007
Figure 3.14.2: Rubella notification rates, Australia, 1999 to 2007,* by age group, sex and year of diagnosis

* Notifications – diagnosis between January 1999 and December 2007
Figure 3.14.3: Rubella hospitalisation rates, Australia, 1998/1999 to 2006/2007,* by age group, sex and year of separation

* Hospitalisations – separation between July 1998 and June 2007
Figure 3.15.1: Tetanus notifications and hospitalisations, Australia, 1993 to 2007,* by year of diagnosis or admission

* Notifications – diagnosis between January 1993 and December 2007
Hospitalisations – admission between July 1993 and June 2007
Data for each financial year are plotted according to year in which financial year began
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* Notifications – diagnosis between January 2006 and December 2007
Hospitalisations – separation between July 2005 and June 2007
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* Hospitalisations – admission between July 1993 and June 2007
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* Hospitalisations – separation between July 2005 and June 2007
Figure 3.16.3: Varicella hospitalisation rates, Australia, 2002/2003 to 2006/2007, * by age group (0–4 years) and year of separation

* Hospitalisations – separation between July 2002 and June 2007
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* Notifications – diagnosis between January 2002 and December 2007
Figure 3.16.5: Varicella notifications and rates, South Australia, 2006 to 2007,* by age group and sex

* Notifications – diagnosis between January 2006 and December 2007
Figure 3.16.6: Herpes zoster notifications, South Australia, 2002 to 2007,* by month of notification

* Notifications – diagnosis between January 2002 and December 2007
Figure 3.16.7: Herpes zoster notifications and rates, South Australia, 2006 to 2007*, by age group and sex

* Notifications – diagnosis between January 2006 and December 2007
Historical Graphs by Disease
Figure 6.1.1: Diphtheria, 1917 to 2007*

Figure 6.1.2: Hepatitis A, 1952 to 2007*


2005 - HAV vaccination program commenced for Aboriginal and Torres Strait Islander children in NT, Qld, WA and SA

1994 - HAV vaccine approved
Figure 6.1.3: Measles, 1917 to 2007*

- 1970 - Measles vaccine became widely available
- 1993 - Second dose of MMR vaccine introduced for 10-16 year olds
- 1998 - Second dose of MMR vaccine lowered to age 4-5 years; Measles Control Campaign
- 2000 - Second dose of MMR vaccine lowered to age 4 years

Figure 6.1.4: Meningococcal disease (invasive), 1949 to 2007*

2003 - National Meningococcal C vaccination program commenced. Meningococcal C conjugate vaccine added to vaccination schedule.

Figure 6.1.5: Mumps, 1932 to 2007*

Figure 6.1.6: Pertussis, 1917 to 2007*

1942 - Mass vaccination with pertussis vaccine commenced

1953 - DTP vaccination introduced

1994 - Fifth dose of DTP at 4-5 years of age added to the vaccination schedule (replacing CDT vaccine)

2003 - Fourth dose of DTPa at 18 months of age no longer recommended

2004 - dTpa funded for adolescents (15-17 years of age in most jurisdictions), replacing the dT dose

Figure 6.1.7: Poliomyelitis, 1917 to 2007*

1956 - Mass vaccination with IPV commenced
2005 - IPV funded to replace OPV, in combination vaccines

1966 - OPV introduced

1998 - OPV booster dose to 4 year olds before starting school
1994 - Reinforcing OPV to 15 year olds

Figure 6.1.8: Rubella, 1942 to 2007*

Figure 6.1.9: Tetanus, 1921 to 2007*
