Communicable diseases surveillance

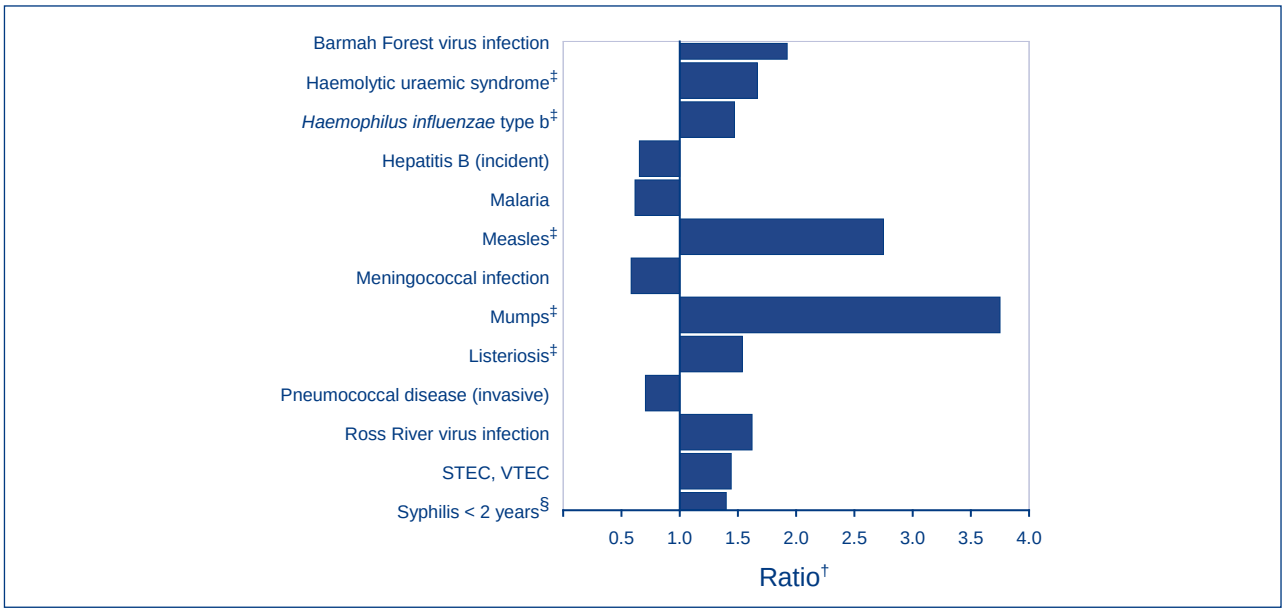
Highlights for 1st quarter, 2008

Communicable diseases surveillance highlights report on data from various sources, including the National Notifiable Diseases Surveillance System (NNDSS) and several disease specific surveillance systems that provide regular reports to Communicable Diseases Intelligence. These national data collections are complemented by intelligence provided by state and territory communicable disease epidemiologists and/or data managers. This additional information has enabled the reporting of more informative highlights each quarter.

The NNDSS is conducted under the auspices of the Communicable Diseases Network Australia. NNDSS collates data on notifiable communicable diseases from state and territory health departments. The Virology and Serology Laboratory Reporting Scheme (LabVISE) is a sentinel surveillance scheme which collates information on laboratory diagnosis of communicable diseases. In this report, data from the NNDSS are referred to as 'notifications' or 'cases' while data from the LabVISE scheme are referred to as 'laboratory reports'.

Figure 1 shows the changes in selected disease notifications to the National Notifiable Diseases Surveillance System (NNDSS) with an onset in the first quarter (January to March) 2008, in comparison with the 5-year mean for the same period. Notifications were above the 5-year mean for the same period and exceeded 2 standard deviations from the 5-year mean for: Barmah Forest virus infection, haemolytic uraemic syndrome, listeriosis, measles and mumps. Notifications were above the 5-year mean, but less than 2 standard deviations from the 5-year mean, for *Haemophilus influenzae* type b, Ross River virus infection, Shiga toxin-producing/verotoxin-producing *Escherichia coli* (STEC/VTEC) and syphilis (less than 2 years duration). Notifications were below the 5-year mean for hepatitis B (incident), malaria, meningococcal infection and invasive pneumococcal disease.

Figure 1. Selected* diseases from the National Notifiable Diseases Surveillance System, comparison of provisional totals for the period 1 January to 31 March 2008 with historical data†



* Selected diseases are chosen each quarter according to current activity. Five year averages and the ratios of notifications in the reporting period in the 5 year mean should be interpreted with caution. Changes in surveillance practice, diagnostic techniques and reporting, may contribute to increases or decreases in the total notifications received over a 5 year period. Ratios are to be taken as a crude measure of current disease activity and may reflect changes in reporting rather than changes in disease activity.

† Ratio of current quarter total to mean of corresponding quarter for the previous 5 years.

‡ Where the mean of the current quarter exceeds the mean of the corresponding quarter for the previous 5 years by more than 2 standard deviations.

§ Ratio for syphilis of less than 2 years duration is based on 4 years data.

Vectorborne diseases

There are currently 8 notifiable mosquito-borne diseases under national surveillance in Australia. These include alphaviruses (Barmah Forest virus and Ross River virus), flaviviruses (dengue, Japanese encephalitis, Kunjin, Murray Valley encephalitis and flavivirus infection not elsewhere classified) and malaria.

In Australia the alphaviruses, Barmah Forest virus and Ross River virus, are of major public health significance, causing annual epidemics with seasonal peaks occurring between January and May each year. Infection with either of these diseases is characterised by rash, fever, fatigue and joint pain.

Barmah Forest virus infection

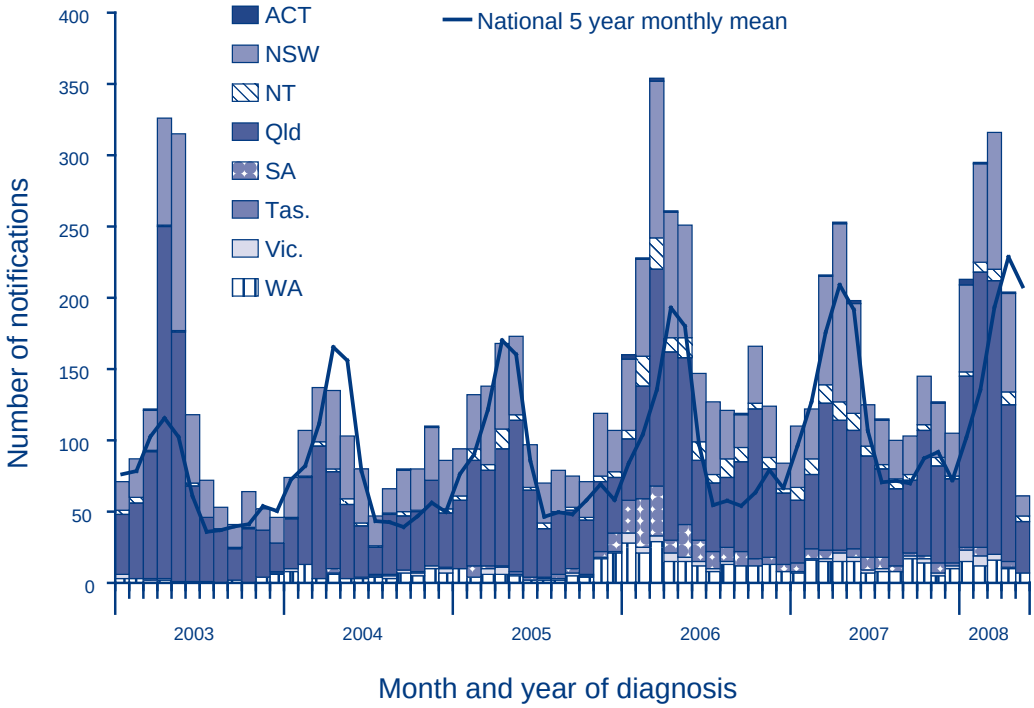
During the first quarter of 2008 there were 824 notifications of Barmah Forest virus infection, which was 93% higher than the 5-year mean for the previous corresponding quarters. All jurisdictions, except Tasmania, reported cases with the majority of cases notified from Queensland (n=505, 61%) and New South Wales (n=226, 28%).

The notification rate was highest in Queensland at 48.3 cases per 100,000 population (annualised), while in the Northern Territory, although only 18 notifications of Barmah Forest virus infection were received, the rate was 33.5 cases per 100,000 population. The rates in these jurisdictions were substantially higher compared with the other jurisdictions where rates were around 13.1 cases per 100,000 population in New South Wales, 8.2 cases per 100,000 population in Western Australia and 5.9 cases per 100,000 population in the Australian Capital Territory.

The total number of cases for the quarter represented a substantive increase from the previous quarter (n=373) and the same quarter in 2007 (n=436). The increase in cases in this quarter may be attributable to increased seasonal rainfall, especially in Queensland, higher than average overnight temperatures and other environmental conditions which promote mosquito breeding and the transmission of the virus.

Figure 2 shows the number of notifications for Barmah Forest virus infection received by NNDSS against the 5-year monthly mean for the period between 2003 and the first quarter of 2008. The entire period from June 2007 to March 2008 was above the 5-year monthly rolling mean, highlighting increased inter-seasonal and seasonal activity, with a higher number of notifications received in the first quarter of 2008 (n=824), compared with the seasonal peak within the first quarter of 2006 (n=742).

Figure 2. Notifications of Barmah Forest virus infection, Australia, 1 January 2003 to 31 March 2008, by month of diagnosis



Ross River virus infection

There were 2,756 notifications of Ross River virus infection reported in the first quarter of 2008, nearly 2.5 times higher than the corresponding period in 2007, however in comparison to the 5-year mean for the previous corresponding quarters it was only 1.6 times higher. Over half of the cases notified to NNDSS (n=1,560, 57%) were from Queensland. New South Wales reported 607 cases (22%) and Western Australia reported 258 cases (9%).

Although only 92 notifications of Ross River virus infection were reported from the Northern Territory, the notification rate was 171.2 cases per 100,000 (annualised), and in Queensland the rate was 149.2 cases per 100,000 population. The notification rates in the Northern Territory and Queensland were substantially higher than in other jurisdictions (49.0 cases per 100,000 population in Western Australia, 43.0 cases per 100,000 population in Tasmania and 35.2 cases per 100,000 population in New South Wales).

Figure 3 shows the number of notifications for Ross River virus infection received by NNDSS nationally against the 5-year rolling mean for the period between 2003 and the first quarter of 2008. As highlighted in this figure, the seasonal peak has shifted from March–April to February in the first quarter of 2008 (n=2,756) and appears to be moderately high and above the 5-year rolling mean, however it is not as high as the seasonal peak in the first quarter of 2006 (n=3,433).

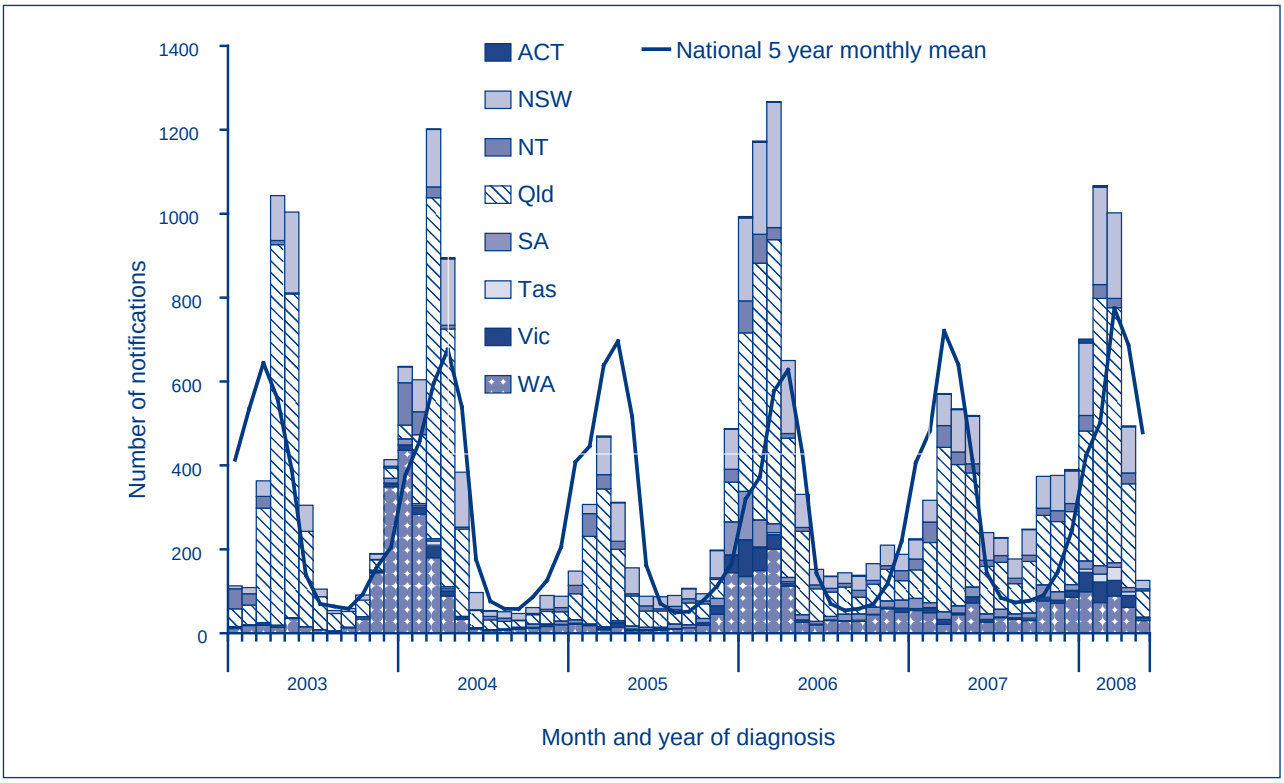
Vaccine preventable diseases

Measles

Measles is an acute, highly communicable viral disease that can lead to serious complications such as pneumonia (lung infection), encephalitis (inflammation of the brain) or otitis media (middle ear infection). In the past measles infection was a common childhood illness, but as a result of national immunisation campaigns measles is now rare in Australia, except for occasional outbreaks of limited duration that are generally linked to an imported case.[1]

Between 1 January and 31 March 2008, 33 cases of measles were reported to the NNDSS, three times the number of notifications received for the whole of 2007 (n=11). Cases were reported from New South Wales (n=15), Queensland (n=8), Western Australia (n=4), the Northern Territory (n=3), Victoria (n=2) and South Australia (n=1). The number of cases for the first quarter of 2008 (n=33) was 2.8 times higher than the 5-year mean (n=12). Figure 4 shows the epidemic curve of measles cases since 2003 by jurisdiction. The high number of

Figure 3. Notifications of Ross River virus infection, Australia, 1 January 2003 to 31 March 2008, by month of diagnosis



notifications reported in 2006 were associated with a touring Indian spiritual leader, which led to a multi-jurisdictional outbreak of measles in April 2006.

This quarter there was an annualised notification rate of 6.3 cases per 1,000,000 population, with 4.8 cases per 1,000,000 being locally acquired cases of measles and 1.5 cases per 1,000,000 reported as acquiring measles outside Australia. The annualised notification rate for this quarter is higher than in previous years, including the multi-jurisdictional outbreak that occurred in 2006 (6.1 cases per 1,000,000 population). This is due to several localised clusters and outbreaks in New South Wales and Queensland respectively, with secondary epidemiologically linked cases associated with cases who acquired measles outside Australia.

Fifty-eight per cent of cases were male and 42% were female. The age of cases ranged from less than 1 year to 48 years. Of the 33 cases, vaccination status was known for 26 cases. Three of the cases (9%) were reported as being fully vaccinated for age, 4 (12%) cases were reported as being partially vaccinated for age and 19 (58%) cases were reported as not vaccinated.

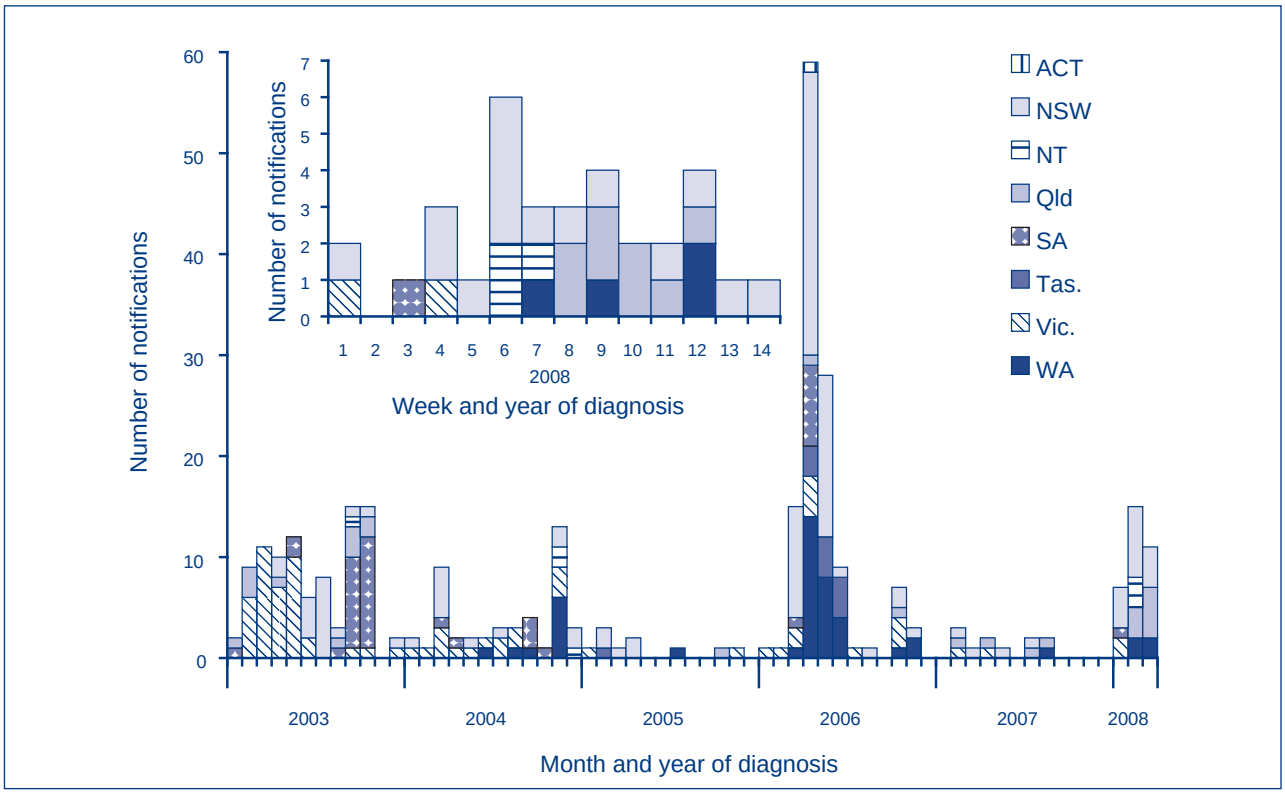
Eight of the cases (24%) were reported as acquiring measles outside Australia from countries including Thailand, India, China and the United Arab Emirates. Four secondary cases (12%) were epidemiologically linked to these imported cases; 2 of these reported from the Northern Territory were linked to an overseas acquired case through travel on the same flight from China to Melbourne via Darwin; a third case was exposed to the same overseas acquired case in the Darwin airport terminal.

An outbreak of measles in the Cairns area of Queensland was identified in late March. Eight cases were reported in two parallel chains of transmission, consisting of 4 cases each. All cases were unvaccinated. There were no recent overseas travel histories or contact with overseas travellers reported.

The virus genotype associated with both the Queensland outbreak and the Darwin cases was confirmed as H1 (personal communication, Dr Mike Catton, Victorian Infectious Diseases Reference Laboratory, CDNA Teleconference, 14 May 2008). The genetic material from these cases shared identical sequence within the nucleoprotein and was identical in this region to measles viruses from cases in New York in 2006 and Shanghai in 2003.

The only other genotyping data reported in 2008 was a D4 from a case in January who had returned from India. There is evidence that Australia currently has no endemic measles genotypes in circulation, with interruption of the endemic transmission of measles having occurred in the 1990s.[2]

Figure 4. Epidemic curve of notifications of measles, Australia, 1 January 2003 to 31 March 2008, by week of diagnosis and state or territory



The current National Immunisation Program Schedule recommends two doses of the measles, mumps and rubella vaccine (MMR) at 12 months of age and at 4 years of age, unless there is a contraindication. High-level vaccination coverage is imperative to enable measles elimination, requiring rates for each new birth cohort of >95% for a single dose and >90% for 2 doses.[3] Coverage data from March 2007 indicates that 93.7% of Australian children for the birth cohort 1 October to 31 December 2004 were immunised for MMR at age 2 years. The proportion of children immunised at 6 years of age for MMR was 88.9%.[4]

Other bacterial infections

Meningococcal disease

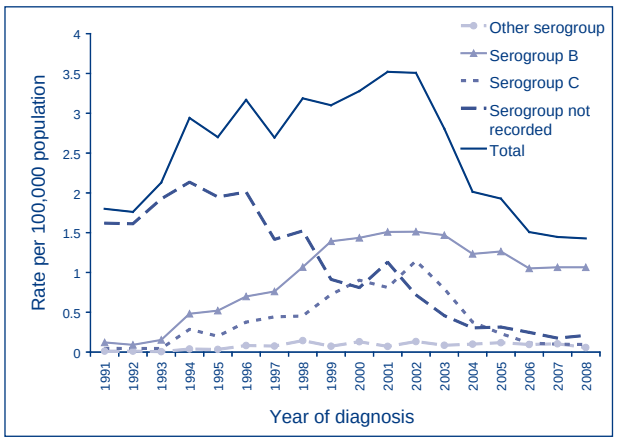
Meningococcal disease is caused by bacterial infection with *Neisseria meningitidis*, which is a gram-negative diplococcus carried and transmitted by humans.[5] The disease is characterised by the sudden onset of fever, intense headache, nausea, stiff neck and photophobia.[6] There are 13 known serogroups and globally serogroups A, B, C, W-135 and Y are the serogroups most commonly associated with disease. In January 2003, the National Meningococcal C Vaccination Program commenced to provide meningococcal C vaccine, to all Australian children aged 1 to 19 years, and the vaccine was also added to the National Immunisation Program schedule.[5]

Between 1 January and 31 March 2008 there were 44 notifications of meningococcal infection reported nationally, half the number of cases reported in the previous quarter (n=78) and similar to the number reported for the corresponding period in 2007 (n=45). Cases were aged between less than 1 year and 77 years, with 32% of cases aged 0–4 years (n=14), 23% aged 5–14 years (n=10) and 18% aged 15–24 years (n=8).

Serogroup data were available on 35 (80%) of the notified cases in the quarter. Twenty-nine (66%) were serogroup B, 5 (11%) were serogroup C, 1 case (2%) was serogroup Y, and in the remaining cases the serogroup was either not typed or no data were provided (n=9, 21%).

Since the introduction of the National Meningococcal C Vaccination Program in 2003, there has been a decrease in the overall number of cases of meningococcal disease, and a steady decline in the number of serogroup C infections among the 0–18 years age group. As shown in Figure 5, although there has been an increase in the proportion of meningococcal infections due to serogroup B, the overall rates of meningococcal infections continue to decline.

Figure 5. Meningococcal disease notifications, Australia, 1 January 1991 to 31 March 2008, by serogroup (annualised rate per 100,000 population)



Acknowledgements

Thanks go to staff of the Surveillance Policy and Systems Section of the Australian Government Department of Health and Ageing and all our state and territory data managers.

References

1. National Health and Medical Research Council. *The Australian Immunisation Handbook*. 9th edn. Canberra: Commonwealth of Australia; 2008. p.201. Available from: http://www.immunise.health.gov.au/internet/immunise/publishing.nsf/Content/5335A7AB925D3E39CA25742100194409/$File/handbook-9.pdf Accessed on 11 May 2008.
2. Heywood AE, Gidding HF, Riddell MA, McIntyre PB, MacIntyre R, Kelly HA. Elimination of endemic measles transmission in Australia. *Bull World Health Organ*. In press 2008.
3. Heath T, Burgess M, McIntyre P, Catton M. The national measles surveillance strategy. *Commun Dis Intell* 1999; 23:41–50.
4. National Centre for Immunisation Research and Surveillance of Vaccine Preventable Diseases. Childhood Immunisation Coverage. Available from: http://www.ncirs.usyd.edu.au/research/r-acir-3-rdquart.html Accessed on 2 July 2008.
5. National Health and Medical Research Council. *The Australian Immunisation Handbook*. 9th edn. Canberra: Commonwealth of Australia; 2008. p.213. Available from: http://www.immunise.health.gov.au/internet/immunise/publishing.nsf/Content/5335A7AB925D3E39CA25742100194409/$File/handbook-9.pdf Accessed on 11 May 2008.
6. Heymann DL ed. *Control of Communicable Diseases Manual*. 18th edn. Washington: American Public Health Association; 2004.