

Editorial

RISE IN INVASIVE SEROGROUP W MENINGOCOCCAL DISEASE IN AUSTRALIA 2013–2015

Mark GK Veitch, Rhonda L Owen

This *Communicable Diseases Intelligence* issue contains an analysis prompted by the recent increase in incidence of invasive meningococcal disease (IMD) due to meningococcal serogroup W (MenW) in Australia.

IMD due to MenW is emerging rapidly in Australia. This editorial provides readers with epidemiological data on MenW current to 2 December 2016 (hereafter YTD i.e. year-to-date); information on the coordinated national public health response; and some of the clinical and public health challenges posed by the emergence of MenW.

Epidemiological situation

Incidence

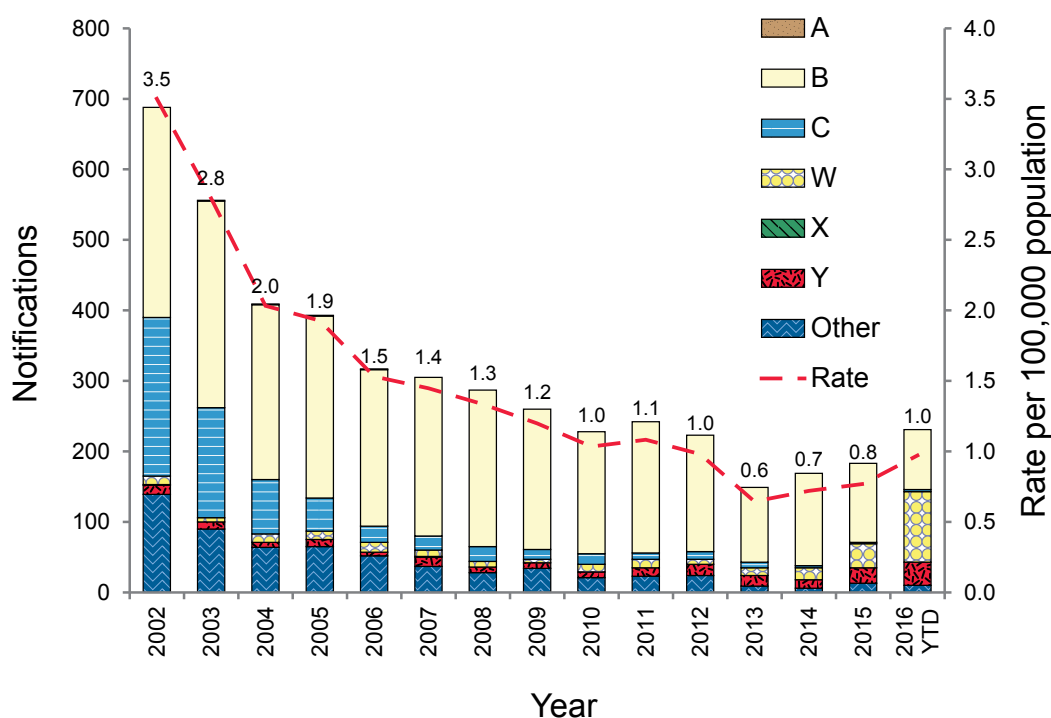
The most recent peak in the incidence of IMD in Australia was in 2001 to 2002, due to serogroup C. The rate of notifications of IMD declined by 82%

from 2002 (3.5 per 100,000; 688 cases) to 2013 (0.6 per 100,000; 149 cases) (Figure). IMD subsequently increased, with 169 cases in 2014, 183 cases in 2015 and 231 cases YTD in 2016.

From 2002 to 2015, serogroup B meningococcal infection was the most common cause of IMD in Australia. However, in 2016, meningococcal serogroup W (MenW) became the predominant meningococcal serogroup in Australia, accounting for 43% of notifications of IMD (100 of 231 IMD cases in 2016 YTD) (Figure). Since April 2016 one-third or more of IMD notifications each month have been caused by MenW.

Seven of the 11 deaths from IMD notified to the Australian National Notifiable Diseases Surveillance System in 2016 YTD were due to MenW.

Figure: Notifications and rates of invasive meningococcal disease, 2002 to December 2016,*Australia, by serogroup



* As of 2 December 2016.

Temporal pattern

IMD tends to follow a seasonal pattern in Australia, with disease most common between June and September each year. In 2016 notifications peaked later, with 38 cases in both August and October. Notifications substantially decreased in November 2016 (18 cases).

Geographical distribution

MenW is contributing to an increasing burden of IMD in all jurisdictions except the Northern Territory. Compared with 2015, the number of MenW notifications has more than doubled in 2016 YTD, in New South Wales (8 to 26 cases), Queensland (4 to 12 cases), Western Australia (4 to 12 cases), Victoria (17 to 41 cases), South Australia (0 to 4 cases) and Tasmania (1 to 4 cases). In 2016, the Australian Capital Territory reported its 1st case of MenW since 2008.

Age distribution

In 2016 YTD, MenW has been reported in all age groups, except in children aged 10–14 years, and accounts for almost half of IMD in adults aged 65 years or over.

Notifications of MenW have remained low in children aged less than 5 years from 2002 until 2016, with no more than 2 cases reported annually in children aged less than 1 year and no more than 4 cases reported annually in children aged 1–5 years. However in 2016 YTD, there have been 8 cases of MenW reported in children aged less than 1 year and 13 cases in children aged 1–4 years.

International situation

Significant outbreaks of MenW have occurred in countries including the United Kingdom,¹ Brazil, Portugal, Argentina, Chile, Sweden and Taiwan.² In Chile, the incidence of MenW increased from <0.1 per 100,000 population in 2010 to 0.7 per 100,000 population in 2012.³ The epidemiology of MenW in Australia currently has a similar appearance to increases seen internationally, but there remains uncertainty whether the disease in Australia will continue to evolve as experienced elsewhere, such as the United Kingdom and parts of South America.

What is being done nationally about the increase in meningococcal serogroup W?

The Australian Government Department of Health, in collaboration with the states and territories, is closely monitoring the epidemiology of IMD due to MenW in Australia in accordance with

the Emergency Response Plan for Communicable Disease Incidents of National Significance (CDPlan).

Following a rapid assessment, the Chief Medical Officer of Australia established an incident management team, supported by advisory groups, with a focus on examining the current epidemiology of MenW and co-ordinating national responses to MenW. A further assessment will be undertaken in early 2017.

Clinical and public health challenges posed by the emergence of meningococcal serogroup W

Clinicians are familiar with the importance of early diagnosis and early treatment of IMD, and the challenge of identifying severe sepsis from early, non-specific signs of infection. While cases of MenW may have features of bacteraemia or, less commonly, meningitis, less typical presentations have occurred, including septic arthritis and epiglottitis in older age groups. In the United Kingdom gastrointestinal symptoms were noted among adolescents, and pneumonia among young children.⁴ Our surveillance must therefore track changes in the age distribution, clinical manifestations, outcomes, and phenotypic and genotypic microbiology of IMD, and communicate findings to clinicians and public health practitioners in Australia.

Quadrivalent meningococcal vaccines that provide protection against IMD due to serogroups A, C, W and Y are available on private prescription in Australia. These are currently recommended for some occupational exposures (e.g. laboratory work), overseas travel to particular destinations, and medical conditions that increase the risk from IMD.⁵ They may also be prescribed for, and purchased electively by, persons who wish to be personally protected against these serogroups of IMD. The consideration of a population-based vaccination program entails various uncertainties and complexities.

The emergence of a new strain of meningococcal bacteria reflects evolving host-microbial ecology.⁶ While vaccination of particular population sectors can be expected to confer direct protection on those vaccinated, the trajectory of the recently emerged MenW strain in the wider Australian population is uncertain, with or without targeted vaccination programs.

Establishing a population-based vaccination program would entail determining the target population or populations so as to prevent disease, avert transmission, and contribute significantly to herd immunity in the wider population. Such a program

would also need to be feasible for jurisdictions and providers to deliver, monitor and thoroughly evaluate, aiming to achieve early high coverage of the target populations.

There remains the need for clinical vigilance by healthcare professionals to suspect and diagnose rare but serious meningococcal disease, and to ensure incident cases are promptly notified to the relevant public health agency.

Author details

Dr Mark GK Veitch¹
Ms Rhonda L Owen²

1. A/g Director of Public Health, Department of Health and Human Services, Tasmanian Government, Tasmania; and Chair, Men W Advisory Group, Communicable Diseases Network Australia
2. Assistant Secretary, Health Emergency Management Branch, Office of Health Protection, Department of Health, Canberra, Australian Capital Territory; and Chair, Incident Management Team, Office of Health Protection, Department of Health

References

1. Ladhani SN, Ramsay M, Borrow R, Riordan A, Watson JM, Pollard AJ. Enter B and W: two new meningococcal vaccine programmes launched. *Arch Dis Child* 2016;101(1):91–95.
2. Borrow R, Alarcón P, Carlos J, Caugant DA, Christensen H, Debbag R, et al. The Global Meningococcal Initiative: global epidemiology, the impact of vaccines on meningococcal disease and the importance of herd protection. *Expert Rev Vaccines*. 2016:1–16. (Epub ahead of print)
3. Valenzuela MT, Moreno G, Vaquero A, Seoane M, Hormazábal JC, Bertoglia MP, et al. Emergence of W135 meningococcal serogroup in Chile during 2012. *Rev Méd Chil* 2013;141(8):959–967. [es]
4. Joint Committee on Vaccination and Immunisation. Draft minute of the meeting on 5 October 2016. Public Health England. Accessed on 30 November 2016. Available from <https://app.box.com/s/iddfb4ppwkmjtju-sir2tc/1/2199012147/102204740544/1>
5. Meningococcal disease. In: Australian Technical Advisory Group on Immunisation. *The Australian Immunisation Handbook* 10th edn. Accessed on 30 November 2016. Available from <http://www.immunise.health.gov.au/internet/immunise/publishing.nsf/content/Handbook10-home~handbook10part4~handbook10-4-10>
6. Patel MS. Australia's century of meningococcal disease: development and the changing ecology of an accidental pathogen. *Med J Aust* 2007;186(3):136–141.