



**SUMMARY**

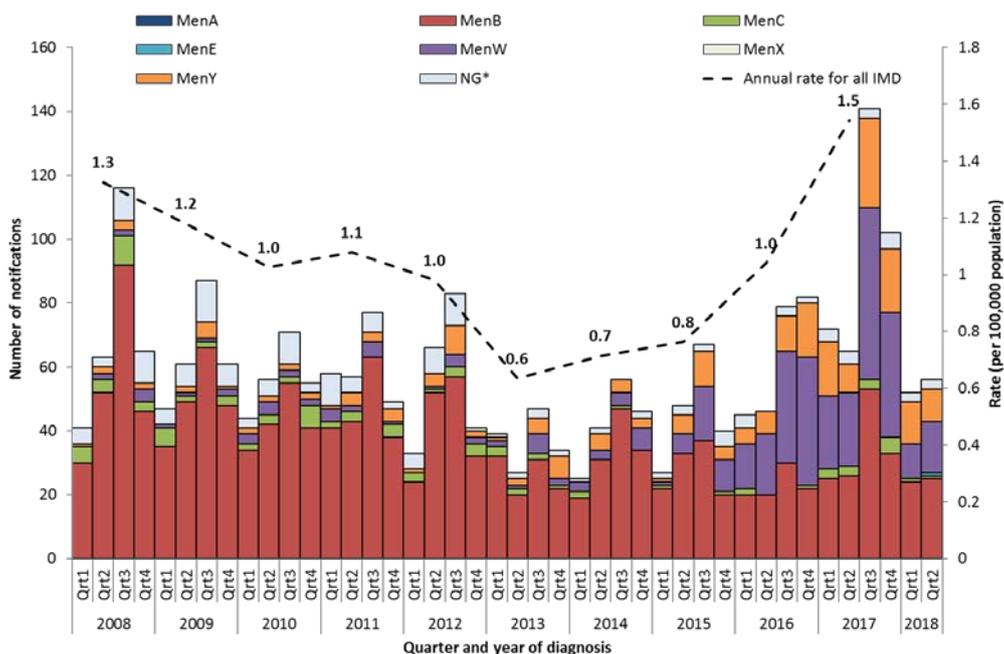
- Nationally the number of invasive meningococcal disease (IMD) cases and overall risk remains low.
- In the 2<sup>nd</sup> quarter of 2018, there were 56 cases of IMD reported to the National Notifiable Diseases Surveillance System (NNDSS). Of these, 25 cases were due to MenB, 16 cases were due to MenW, 10 cases were due to MenY, one was due to serogroup C (MenC), one was due to serogroup E (MenE) and three cases are yet to be classified at the time of reporting.
- The number of IMD cases reported this quarter is 14% fewer than the number reported in the same quarter of 2017 (n=64), but 23% higher compared with the 5 year rolling mean (n=45.4 cases).
- The case of MenE reported this quarter is the first case of this serogroup to be reported in Australia since 2007.
- The case fatality rate of IMD cases reported this quarter was 8.9% (5/56).
- Septicaemia and meningitis were the most common clinical presentations reported for all IMD cases reported in the first two quarters of 2018, which is consistent with the clinical presentation reported for the same period in 2017.

**ANALYSIS**

**National trends**

- The national incidence of IMD in Australia is low (Figure 1). However, in recent years the rate of IMD has increased, with 2017 displaying the highest rate (1.5 per 100,000) since 2007.
- There were 56 cases of IMD reported in the 2<sup>nd</sup> quarter of 2018, which is 8% greater compared to the IMD cases reported in the first quarter of 2018 (n=52) and 14% fewer than the same quarter of 2017 (n=65).
- The case fatality rate (CFR) of IMD this quarter was 8.9% (5/56).
- Of the 56 cases reported this quarter, eight occurred in Aboriginal and Torres Strait Islander peoples.

**Figure 1. Quarterly cases and annual rate of IMD, Australia, 1 January 2008 to 30 June 2018 by serogroup**

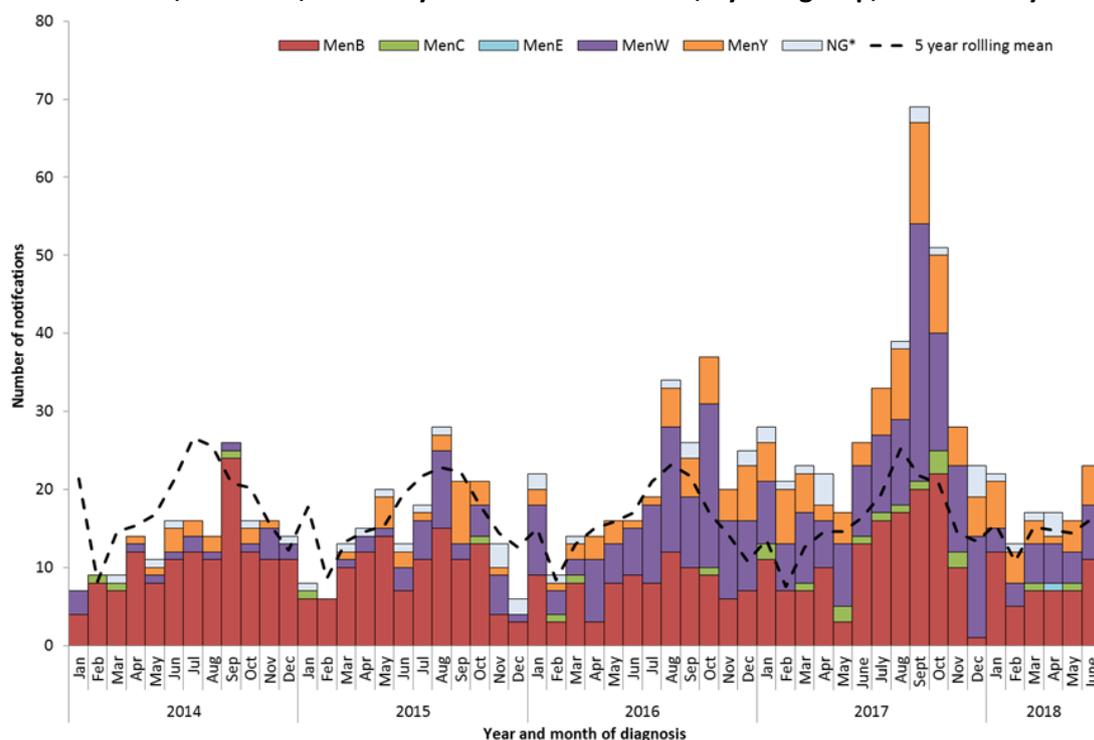


\*NG includes where meningococcal isolates could not be identified ('not groupable'), other isolates not grouped and where serogroup was not known.

## Seasonality

- IMD tends to follow a seasonal pattern in Australia, with disease activity increased between June and September each year (Figure 2).
- IMD notifications in the 2<sup>nd</sup> quarter of 2018 continued to follow the seasonal pattern, with notifications rising in June (n=23).
- Compared with the monthly 5 year rolling mean (range 14.4 to 16.2), cases of IMD reported by month for this quarter are higher (range 16 to 23) (Figure 2).

**Figure 2. Cases of IMD, Australia, 1 January 2014 to 30 June 2018, by serogroup, month and year of diagnosis**

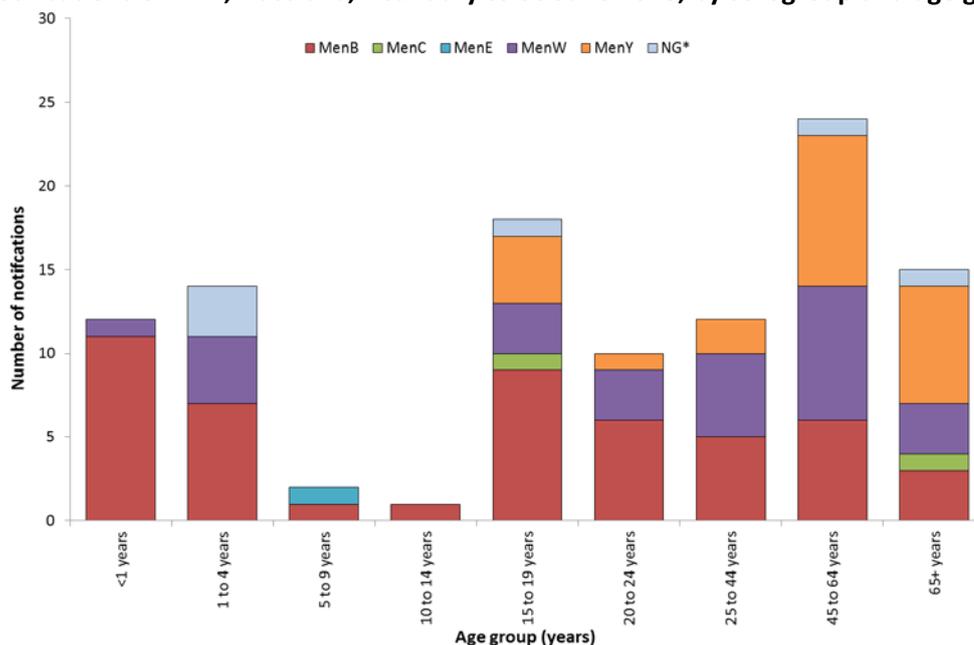


\*NG includes where meningococcal isolates could not be identified ('not groupable'), other isolates not grouped and where serogroup was not known.

## Age Distribution

- In the first two quarters of 2018, there were cases of IMD reported in all age groups (Figure 3). The median age of all IMD cases YTD was 22.5 years (range: 0 years to 96 years).

**Figure 3. Notifications of IMD, Australia, 1 January to 30 June 2018, by serogroup and age group**



\*NG includes where meningococcal isolates could not be identified ('not groupable'), other isolates not grouped and where serogroup was not known.

## Geographical Distribution

- Cases of IMD were reported in all jurisdictions except Tasmania in the first two quarters of 2018 (Table 1).
- Jurisdictional-specific rates in 2018 year to date (YTD) range from 0.2 per 100,000 population in the Australian Capital Territory to 1.6 per 100,000 in the Northern Territory.

**Table 1. Notifications and rates of IMD, Australia, 1 January to 30 June 2018, by serogroup and state and territory**

State or territory	Notifications								Rate (per 100,000 population)	
	A	B	C	E	W	X	Y	NG*		Total
ACT	0	0	0	0	1	0	0	0	1	0.2
NSW	0	14	1	0	6	0	7	1	29	0.4
NT	0	1	0	0	2	0	0	1	4	1.6
QLD	0	13	0	1	5	0	6	2	27	0.5
SA	0	12	0	0	1	0	1	0	14	0.8
TAS	0	0	0	0	0	0	0	0	0	0.0
VIC	0	6	1	0	6	0	8	2	23	0.4
WA	0	3	0	0	6	0	1	0	10	0.4
<b>Australia</b>	<b>0</b>	<b>49</b>	<b>2</b>	<b>1</b>	<b>27</b>	<b>0</b>	<b>23</b>	<b>6</b>	<b>108</b>	<b>0.4</b>

\*NG includes where meningococcal isolates could not be identified ('not groupable'), other isolates not grouped and where serogroup was not known.

## Clinical Presentation and Severity

- In the first two quarters of 2018, the most common typical clinical presentations reported for all IMD cases were septicaemia (44%; 48/108) and meningitis (40%; 43/108) (Table 2). While less frequently identified, the most common atypical clinical presentations were pneumonia (8%; 9/108) and gastroenteritis (8%; 9/108).

**Table 2. Numbers of selected IMD serogroups<sup>^</sup>, Australia, 1 January to 30 June 2018, by selected serogroup and clinical presentation<sup>#</sup>**

Clinical Presentation <sup>#</sup>		MenB	MenW	MenY	All IMD serogroups
Typical	Septicaemia	24(49%)	11(41%)	8(35%)	48(44%)
	Bacteraemia	16(33%)	11(41%)	9(39%)	37(34%)
	Meningitis	30(61%)	4(15%)	6(26%)	43(40%)
Atypical	Pneumonia	2(4%)	3(11%)	4(17%)	9(8%)
	Septic arthritis	2(4%)	1(4%)	1(4%)	4(4%)
	Epiglottitis/pharyngitis	1(2%)	0(0%)	0(0%)	1(1%)
	Conjunctivitis	0(0%)	0(0%)	0(0%)	0(0%)
	Gastroenteritis	3(6%)	4(15%)	0(0%)	9(8%)
	Other	3(6%)	4(15%)	0(0%)	8(7%)
<b>Total cases</b>		<b>49</b>	<b>27</b>	<b>23</b>	<b>108</b>

\*NG includes where meningococcal isolates could not be identified ('not groupable'), other isolates not grouped and where serogroup was not known.

# More than one clinical presentation can be reported for each IMD case.

<sup>^</sup>The collection of enhanced surveillance data for IMD for all serogroups has occurred since 1 January 2017. The collection of this data has varied between jurisdictions and over time, and are subject to retrospective revision. For this reason, enhanced IMD surveillance data should be considered with caution.

- Of the 108 IMD cases reported in the first two quarters of 2018, 44% (47/108) were admitted to ICU, which was higher than the proportion of IMD cases reported for the same period of 2017 (36%; 50/137).

## Serogroup analyses

- The three most common meningococcal serogroups currently reported in Australia are MenB, MenW and MenY.
- From 2002 to 2015, MenB was the predominant serogroup in Australia. However, from 2016 there has been a shift in meningococcal serogroups causing invasive disease in Australia, with an increasing proportion of cases caused by MenW and MenY (Figure 1).

### Serogroup B (MenB)

- In the first two quarters of 2018, there were 49 cases of MenB reported (Table 1), representing 45% of all IMD cases reported YTD and a decrease of 4% on the number of MenB cases reported in the same period of 2017 (n=51).
- MenB is the only serogroup with cases reported in all age groups in 2018 YTD (Figure 3). The median age of MenB cases reported YTD was 17 years (range: 0 years to 69 years).
- In 2018 YTD, 14% (7/49) of MenB cases were reported in Aboriginal and Torres Strait Islander peoples.

#### Clinical presentation, severity and risk factors of MenB

- This quarter there was one death due to MenB reported; a total of two deaths reported in 2018 YTD.
- The most common typical clinical presentation of MenB cases reported YTD was meningitis (61%; 30/39), followed by septicaemia (49%; 24/49) (In the first two quarters of 2018, the most common typical clinical presentations reported for all IMD cases were septicaemia (44%; 48/108) and meningitis (40%; 43/108) (Table 2). While less frequently identified, the most common atypical clinical presentations were pneumonia (8%; 9/108) and gastroenteritis (8%; 9/108).
- Table 2). MenB cases reported YTD rarely presented atypically.
- In 2018 YTD, 59% (24/49) cases of MenB were admitted to an intensive care unit.
- The most common risk factors associated with MenB infection in the first two quarters of 2018 included having a smoker in the household (29%; 14/49), attending a school or university (18%; 9/49), being a current smoker (12%; 6/49) and having a chronic disease (10%; 5/49). The same common risk factors were identified for MenB cases for the same period of 2017, with the exception of being a current smoker.

### Serogroup W (MenW)

- In the first two quarters of 2018, there were 27 cases of MenW reported (Table 1), representing 25% of all IMD cases reported YTD and a decrease of 41% on the number of MenW cases reported in the same period of 2017 (n=46).
- In 2018 YTD, MenW was reported in all age groups except the 5–9 and 10–14 years age groups (Figure 3). The median age of MenW cases reported YTD was 31 years (range: 0 years to 92 years).
- In 2018 YTD, 33% (9/27) of MenW cases were reported in Aboriginal and Torres Strait Islander peoples.

#### Clinical presentation, severity and risk factors of MenW

- There were two deaths due to MenW reported in 2018 YTD. Both of these were reported in the 2<sup>nd</sup> quarter of 2018.
- The most common typical clinical presentations of MenW cases reported YTD were bacteraemia (41%; 11/27) and septicaemia (41%; 11/27) (Table 2). The most common atypical presentation was gastroenteritis (15%; 4/27).
- In 2018 YTD, 59% (16/27) of MenW cases were admitted to an intensive care unit.
- The most common risk factors associated with MenW infection in 2018 YTD included having a chronic disease (30%; 8/27), attending a school or university (11%; 3/27), attending a nightclub or bar (11%; 3/27) or having a current smoker in the household (11%; 3/27). These were similar to the risk factors reported in MenW cases in the same period of 2017, with the exception of attending a night club or bar.

### Serogroup Y (MenY)

- In the first two quarters of 2018, there were 23 cases of MenY reported (Table 1), representing 21% of all IMD cases reported YTD and a decrease of 13% on the number of MenY cases reported in the same period of 2017 (n=26).
- In 2018 YTD, MenY cases were only reported in age groups 15 years or older (Figure 3). The median age of MenY cases reported YTD was 60 years (range: 18 years to 96 years).
- There have been no cases of MenY reported in Aboriginal and Torres Strait Islander people in 2018 YTD.

### Clinical presentation, severity and risk factors of MenY

- There was one death due to MenY reported in 2018 YTD, which was reported this quarter.
- The most common typical presentations reported YTD were bacteraemia (39%; 9/23) and septicaemia (35%; 8/23) and the most common atypical presentation was pneumonia (17%; 4/23)(In the first two quarters of 2018, the most common typical clinical presentations reported for all IMD cases were septicaemia (44%; 48/108) and meningitis (40%; 43/108) (Table 2). While less frequently identified, the most common atypical clinical presentations were pneumonia (8%; 9/108) and gastroenteritis (8%; 9/108) (Table 2).
- In 2018 YTD, 26% (6/23) of MenY cases were admitted to an intensive care unit.
- The most common risk factors associated with MenY infections in the first two quarters of 2018 included having a chronic disease (48%; 11/23), being a current smoker (17%; 4/23), and having history of overseas travel (9%; 2/23). These were similar to the risk factors reported in MenY cases in the same period of 2017, with the exception of history of international travel.

### **Other serogroups (Men A, C, X and E)**

- Notifications of MenC have dramatically declined from 225 cases in 2002 to 14 cases in 2017 (a 94% decline) since the introduction of the MenC vaccine in 2003. So far in 2018 there have been two cases of MenC reported in Australia.
- Serogroup A (MenA), MenE and serogroup X (MenX) are rare in Australia. Since 2002 there have been only four cases of MenA, two cases of MenE and two cases of MenX reported in Australia.
- In the second quarter of 2018, Queensland reported a case of IMD due to MenE. This is the first time this serogroup has been reported in Australia since 2007.

## **BACKGROUND**

- IMD typically manifests as meningitis, sepsis or bacteraemia and mainly affects children aged younger than 5 years and adolescents (15–19 years) with a seasonal peak of cases in winter and early spring.
- The bacteria causing this disease, *Neisseria meningitidis*, are carried by a proportion of the population without developing disease. The prevalence and duration of asymptomatic nasopharyngeal carriage of meningococci vary over time and in different population and age groups. Adolescents have the highest carriage rates, peaking in 19-year olds, and so play an important role in transmission.<sup>3</sup>
- The clinical manifestations of meningococcal septicaemia and meningitis may be non-specific and can include sudden onset of fever, rash (petechial, purpuric or maculopapular), headache, neck stiffness, photophobia, altered consciousness, muscle ache, cold hands, thirst, joint pain, nausea and vomiting. However, non-specific presentation is not uncommon for IMD, making early diagnosis challenging.
- Meningococcal infections can progress rapidly to serious disease or death in previously healthy persons. A number of medical conditions are known to increase the risk of an individual developing IMD. People who survive infection can develop permanent sequelae, including limb deformity, skin scarring, deafness and neurologic deficits.
- Funded immunisation against meningococcal disease in Australia has been targeted at MenC, with a National Immunisation Program (NIP) vaccine administered to children at 12 months of age. The Pharmaceutical Benefits Advisory Committee (PBAC) has recommended that the MenC vaccine on the NIP be replaced with a funded MenACWY vaccine. The Department of Health and jurisdictions will be implementing this change on 1 July 2018.
- In addition to the NIP, a number of jurisdictions have also implemented state-based vaccination programs using ACWY vaccine targeting adolescents. Further information of these can be found on the Department of Health's [meningococcal disease website](#).

## **DATA CONSIDERATIONS**

Data were extracted from the NNDSS on 1 August 2018, by diagnosis date. Due to the dynamic nature of the NNDSS, data in this extract are subject to retrospective revision and may vary from data reported in published NNDSS reports and reports of notification data by states and territories.

## REFERENCES

- <sup>1</sup> Northern Territory Government, 2017. Health Alert: Meningococcal outbreak in Central Australia. Available at: <http://mediareleases.nt.gov.au/mediaRelease/23733>
- <sup>2</sup> Mustapha, M. M. et al. 2016. Global epidemiology of capsular group W meningococcal disease (1970–2015): Multifocal emergence and persistence of hypervirulent sequence type (ST)-11 clonal complex. *Vaccine 34 (13): 1515-1523*.
- <sup>3</sup> Christensen H. et al. 2010. Meningococcal carriage by age: a systematic review and meta-analysis. *Lancet Infectious Diseases Dec 2010: 853-61*.