



**SUMMARY**

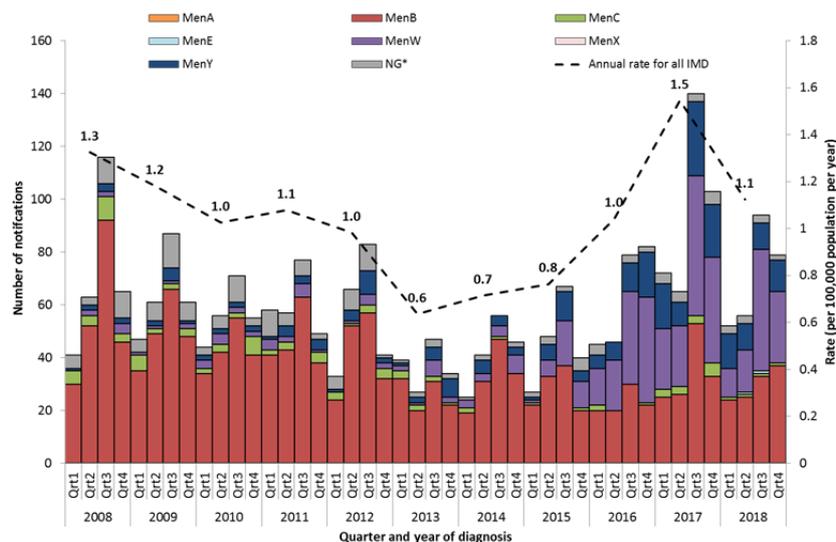
- Nationally, the number of invasive meningococcal disease (IMD) cases this quarter remains within the range of the previous five years and is lower than the number of cases reported in quarter 3 in 2018 and quarter 4 in 2017.
- In 2018, 281 cases of IMD were reported to the National Notifiable Diseases Surveillance System (NNDSS).
- Of these, 79 occurred in the 4<sup>th</sup> quarter. Most cases in the quarter were due to serogroup B (MenB, n=37, 47%), 27 cases (34%) were due to serogroup W (MenW), 12 cases (15%) were due to serogroup Y (MenY), one was due to serogroup C (MenC), and two cases were not grouped at the time of reporting.
- The number of IMD cases reported this quarter is 23% fewer than the number reported in the same quarter of 2017 (n=103), but 30% higher compared with the 5 year mean for this quarter (n=61 cases).
- The case fatality rate of IMD cases reported this quarter was 2.5% (2/79).
- The most common risk factor reported amongst cases in 2018 was having a chronic disease (19%; 53/281), followed by having a smoker in the household (14%; 39/281), being a current smoker (9%; 25/281) and attending school or university (9%; 25/281).

**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 population per year) since 2006.
- There were 79 cases of IMD reported in the 4<sup>th</sup> quarter of 2018, which is 16% lower compared to the IMD cases reported in the 3<sup>rd</sup> quarter of 2018 (n=94) and 23% fewer than the 4<sup>th</sup> quarter of 2017 (n=103).
- The case fatality rate (CFR) of IMD this quarter was 2.5% (2/79).
- Of the 79 cases reported this quarter, 16 occurred in Aboriginal and Torres Strait Islander peoples.
- Of the 281 cases reported in 2018, 49 occurred in Aboriginal and Torres Strait Islander peoples. These were predominantly due to Men W (65%; 32/49), followed by MenB (29%; 14/49).

**Figure 1. Quarterly cases and annual rate of IMD, Australia, 1 January 2008 to 31 December 2018 by serogroup**

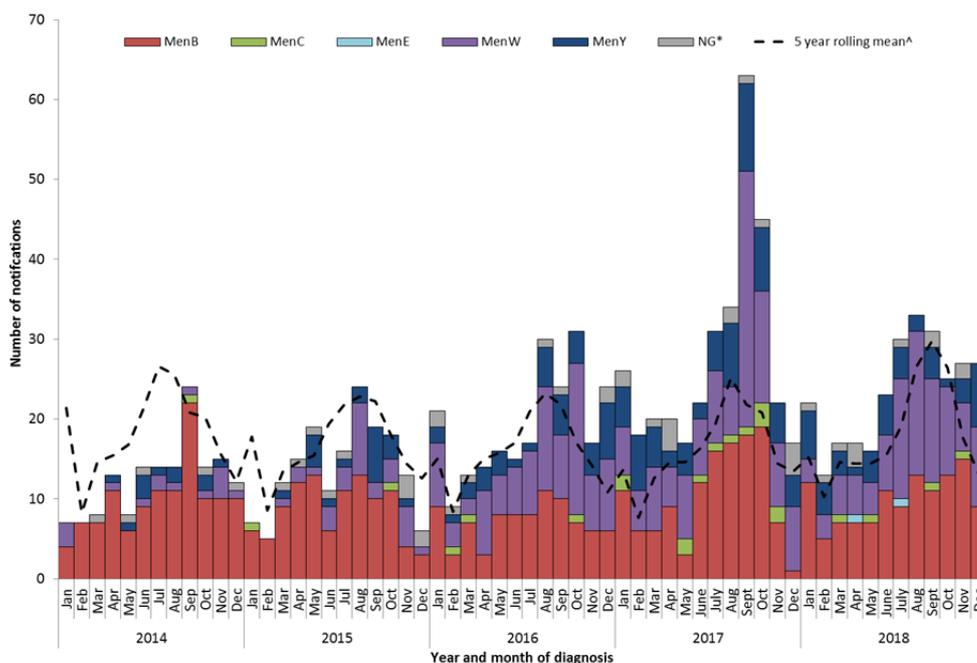


\*NG includes where meningococcal isolates could not be identified ('not groupable'), other isolates not grouped and where serogroup was not known.

## Seasonality

- IMD tends to follow a seasonal pattern in Australia, with increased disease activity between June and September each year (Figure 2).
- IMD notifications in 2018 continued to follow the seasonal pattern, with notifications rising from June and reaching a peak in August.
- Compared with the 5 year monthly rolling mean (mean range 10.8 to 27.8 cases per month during quarter 4 in 2013-2017), cases of IMD reported by month for this quarter were at the higher end of the range (range 25 to 27) (Figure 2).

**Figure 2. Cases of IMD, Australia, 1 January 2014 to 31 December 2018, by serogroup, month and year of diagnosis**



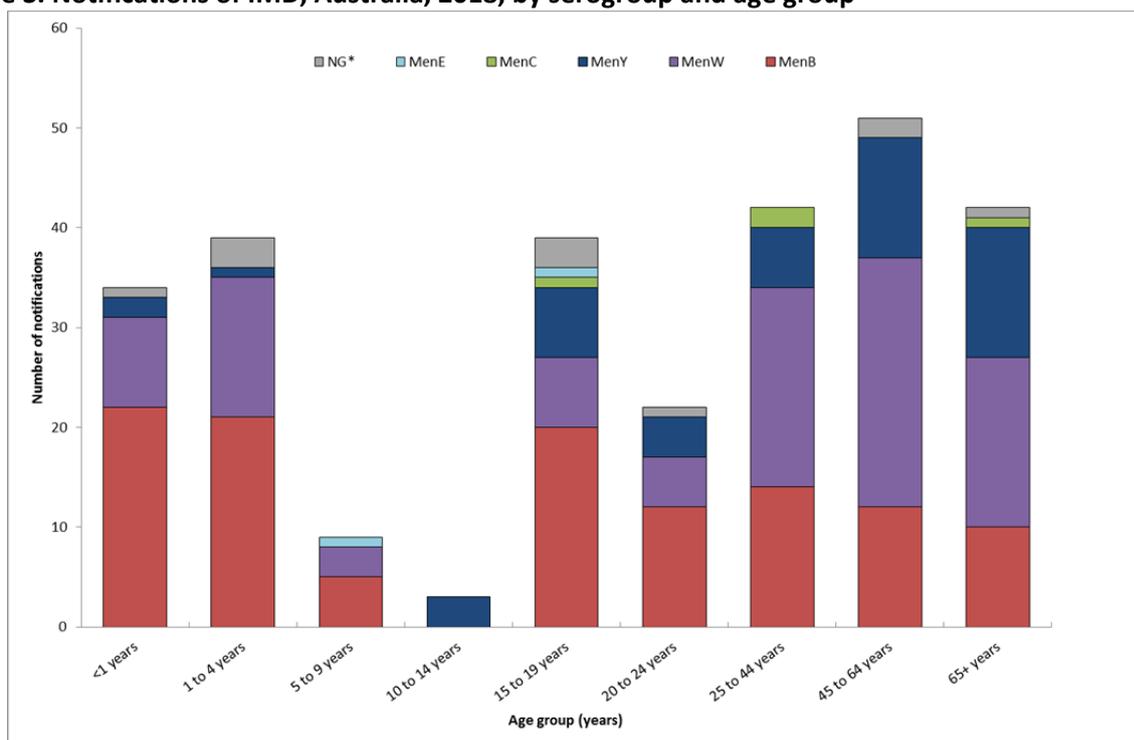
\*NG includes where meningococcal isolates could not be identified ('not groupable'), other isolates not grouped and where serogroup was not known.

^5 year rolling mean for the preceding 5 years

## Age Distribution

- Cases of IMD were reported across all age groups in 2018 (Figure 3). The median age of all IMD cases in 2018 was 24 years (range: 0 years to 96 years).
- Examining five year age groups, the number of cases were highest in those younger than 5 years (n=73) followed by those aged 15-19 (n=39) and cases aged 60-64 years (n=19). The most common age of onset was 0 years followed by 1 year of age.

**Figure 3. Notifications of IMD, Australia, 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

- In 2018, cases of IMD were reported in all jurisdictions (Table 1).
- In 2018, the Australian Capital Territory experienced the lowest rate of IMD (0.5 per 100,000 population per year) and the Northern Territory experienced the highest (4.4 per 100,000 population per year).

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

State or territory	Notifications									Rate (per 100,000 population per year)
	A	B	C	E	W	X	Y	NG*	Total	
ACT	0	0	0	0	2	0	0	0	2	0.5
NSW	0	32	2	0	20	0	16	2	72	0.9
NT	0	2	0	0	7	0	0	2	11	4.4
QLD	0	29	1	2	13	0	11	2	58	1.2
SA	0	27	0	0	4	0	3	0	34	2.0
TAS	0	3	0	0	5	0	2	1	11	2.1
VIC	0	18	1	0	19	0	11	4	53	0.8
WA	0	8	0	0	30	0	2	0	40	1.5
<b>Australia</b>	<b>0</b>	<b>119</b>	<b>4</b>	<b>2</b>	<b>100</b>	<b>0</b>	<b>45</b>	<b>11</b>	<b>281</b>	<b>1.1</b>

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

### Severity and risk factors

- Of the 281 IMD cases reported in 2018, 31% (n=87) were admitted to ICU, which is the same as the proportion of IMD cases admitted to ICU in 2017 (31%; 103/335).
- Of cases admitted to ICU where subtype was reported (n=24), the proportion for serotype MenW was 42% (10/24) and for MenB was 38% (9/24).
- There were 16 deaths amongst reported IMD cases in 2018.

- The case fatality rate (CFR) amongst IMD cases in 2018 was 6% (16/281), compared to 10% CFR in 2017 (n=24/335).
- The serogroups with the highest number of deaths were MenW (CFR 10%; 10/100) followed by MenB (CFR 3%; 4/119).
- The most common risk factor reported amongst cases in 2018 was having a chronic disease (19%; 53/281). This was followed by having a smoker in the household (14%; 39/281), being a current smoker (9%; 25/281) and attending school or university (9%; 25/281).

## 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, since 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). MenB was the predominant serogroup in Australia in 2018.

## Serogroup B (MenB)

- In 2018 there were 119 cases of MenB reported (Table 1), representing 42% of all IMD cases reported and a decrease of 5% on the number of MenB cases reported in 2017 (n=125).
- There were MenB cases reported in all age groups except those aged 10–14 years in 2018 (Figure 3). The median age of MenB cases reported was 17 years (range: 0 years to 78 years).
- In 2018, 12% (14/119) of MenB cases were reported in Aboriginal and Torres Strait Islander peoples.

### Severity and risk factors for MenB

- This quarter there was one death due to MenB reported. There were a total of four MenB deaths reported overall in 2018.
- In 2018, 29% (35/119) of MenB cases were admitted to an intensive care unit.
- The most common risk factors reported amongst MenB cases in 2018 included having a smoker in the household (21%; 25/119), attending a school or university (15%; 18/119) and having a chronic disease (10%; 12/119). In 2017, attending a school or university was the leading risk factor for MenB, followed by having a smoker in a household and attending night clubs or bars.

## Serogroup W (MenW)

- In 2018 there were 100 cases of MenW reported (Table 1), representing 36% of all IMD cases reported and a decrease of 14% on the number of MenW cases reported in 2017 (n=116).
- In 2018, MenW was reported in all age groups except the 10–14 years age group (Figure 3). The median age of MenW cases reported was 36 years (range: 0 years to 92 years).
- In 2018, 32% (32/100) of MenW cases were reported in Aboriginal and Torres Strait Islander peoples.
- In July 2018, there was a local community outbreak of MenW in the northern suburbs of Hobart (Tasmania) which included three cases of serogroup W disease that were tightly clustered in geography and time. In response to this outbreak the Tasmanian Government initiated a free Meningococcal ACWY Immunisation State-wide Program that targeted persons born after 1 August 1997 and at least 6 weeks of age. Further information can be found at the [Tasmanian Department of Health website](#).
- Eight additional cases were notified in Tasmania during 2018. Of these, there were three cases of MenB, two MenW, two MenY, and one case Not Typed. One of the MenW cases died of their infection.

### Severity and risk factors for MenW

- There was one death due to MenW reported this quarter. There were ten deaths due to MenW reported in 2018.
- The age of cases reported to have died from infection with MenW in 2018 ranged from 16 to 60 years, with five of the deaths reported in persons aged younger than 30 years.
- In 2018, 39% (39/100) of MenW cases were admitted to an intensive care unit.

- The most common risk factors associated with MenW infection in 2018 included having a chronic disease (26%; 26/100), being a current smoker (9%; 9/100) or having a current smoker in the household (7%; 7/100). In 2017, the most common risk factor amongst MenW cases was having a chronic disease, followed by having a smoker in the household and attending a school or university.

### Serogroup Y (MenY)

- In 2018 there were 45 cases of MenY reported (Table 1), representing 16% of all IMD cases reported and a decrease of 32% on the number of MenY cases reported in 2017 (n=66).
- In 2018, MenY was reported in all age groups except the 5–9 year age group (Figure 3). The median age of MenY cases reported was 53 years (range: 0 years to 96 years).
- There was one case (2%) of MenY reported in Aboriginal and Torres Strait Islander people in 2018.

### Severity and risk factors for MenY

- There was one death due to MenY reported in 2018, which was reported in quarter 2.
- In 2018, 18% (8/45) of MenY cases were admitted to an intensive care unit.
- The most common risk factors associated with MenY infections in 2018 included having a chronic disease (29%; 13/45) and being immunocompromised (13%; 6/45). In 2017, the most common risk factors reported amongst MenY cases were having a chronic disease and attending nightclubs or bars.

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

- Notifications of MenC have dramatically declined from 225 cases in 2002 to 13 cases in 2017 (a 94% decrease) since the introduction of the MenC vaccine in 2003. In 2018 there have been four cases of MenC reported in Australia.
- In 2018, there were two cases of MenE reported. These were diagnosed in Queensland in quarters 2 and 3, with no epidemiological link identified. Prior to 2018, there have only been two other cases of MenE reported in Australia, one in 2007 and one in 1997.
- Serogroup A (MenA) and serogroup X (MenX) are also rare in Australia. From 2002 there have been only four cases of MenA, and two cases of MenX reported in Australia.

## 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 varies 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>1</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.
- Nationally funded immunisation against meningococcal disease in Australia from 2003 to 30 June 2018 targeted MenC, with administration of the vaccine recommended at 12 months of age. From 1 July 2018, the Pharmaceutical Benefits Advisory Committee (PBAC) recommended that the MenC vaccine on the National Immunisation Program (NIP) be replaced with a funded MenACWY vaccine.
- A number of jurisdictions initiated state-based meningococcal ACWY (MenACWY) immunisation programs in 2017 and early 2018 targeting adolescents aged 15–19 years. MenACWY immunisation was funded under the NIP for children aged 12 months as of 1 July 2018. South Australia introduced a meningococcal B immunisation program in October 2018. Victoria introduced a MenACWY vaccination program from December 2017 to December 2018, following a cluster of MenC cases in this age group in 2017.

- MenACWY immunisation will be funded for adolescent groups under the NIP as of April 2019. For further information on IMD cases reported in Australia and MenACWY immunisation programs please see the [Department of Health Meningococcal Disease website](#).

## DATA CONSIDERATIONS

Data were extracted from the NNDSS on 1 February 2019, 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> Christensen H. et al. 2010. Meningococcal carriage by age: a systematic review and meta-analysis. *Lancet Infectious Diseases Dec 2010: 853-61*.