


  
**Meningitis - what's new?**
  
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**Conflict of Interest**

- Seqirus Advisory Board
- Sanofi Pasteur Advisory Board



**Outline**

- Background
  - Clinical presentation
- Epidemiology meningococcal disease
  - Notified Meningococcal cases
    - National data
    - Victorian data
- Vaccines and recommendations



**Background**

Incidence of invasive meningococcal disease (IMD) fluctuates naturally over time

- Mainly affects children <5 years and adolescents (15-19 years) with a seasonal peak in winter and early spring
- Clinical presentation:
  - **Meningococcal septicaemia**
    - Sudden onset of fever with cold hands and feet
    - Drowsiness, confusion or disorientation
    - Shivering, vomiting, severe aches and pains in the muscles, rapid breathing
    - Rash (petechial, purpuric or maculopapular)
  - **Meningitis**
    - Severe headache, neck stiffness, photophobia, fever, seizures

**Background**

**Neisseria meningitidis**

- carried by approx 10% population without developing disease
- asymptomatic nasopharyngeal carriage varies over time
- adolescents highest carriage rates - important role in transmission

**Outcome**

- Mortality 5-11%
- permanent disability 10-20%: loss of limbs or scarring from skin grafts, learning, visual and hearing difficulties

**IMD cases**

Number of IMD cases and overall risk remains low

- There are 5 common serogroups: A, C, W and Y: most common in Australia are B, C, W, Y
- Decrease in rate IMD by 82% since 2003 introduction MenC
- Deaths
  - 2017: 28 deaths: 8 due MenB, 16 MenW, 3 MenY, 1 MenC
  - 2016: 11 deaths; 2015: 12 deaths
- Men B disease
  - dominant serogroup 2002-2015: 43-78%
  - only 36% cases 2017
  - naturally declined even in the absence of funded vaccination

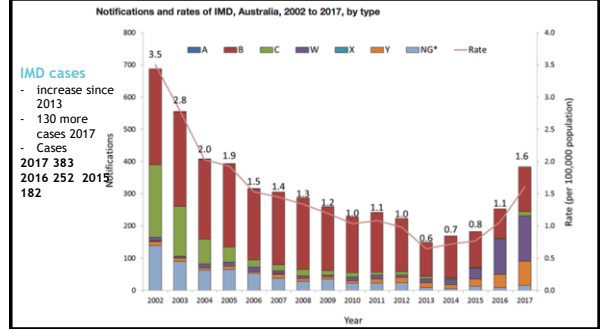
### IMD cases

Recent increase in Men W disease since 2013

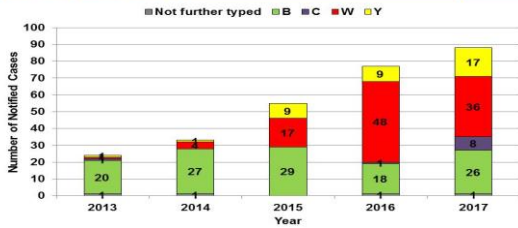
- now main serogroup causing Men disease last 2 years 2016/2017
- 37% cases 2017
- increase in cases in children <10 years since 2015

Small increase Men Y: 40 2016 CW 75 2017: 20% cases 2017

Indigenous people: 61 cases IMD 2017, 75% MenW and 21% MenB, previously MenB



### Invasive meningococcal disease Serogroup and Year Victoria: 2013 to 2017



### Notifications and rates of IMD, Australia, 2017<sup>a</sup> by state and territory and serogroup

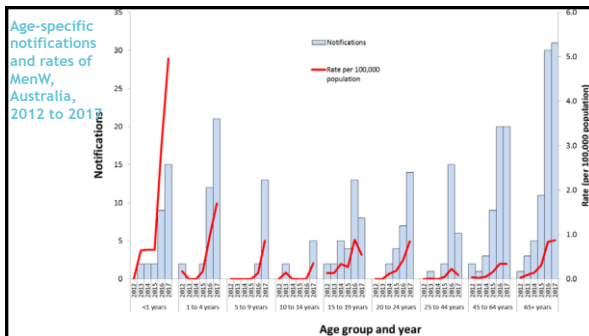
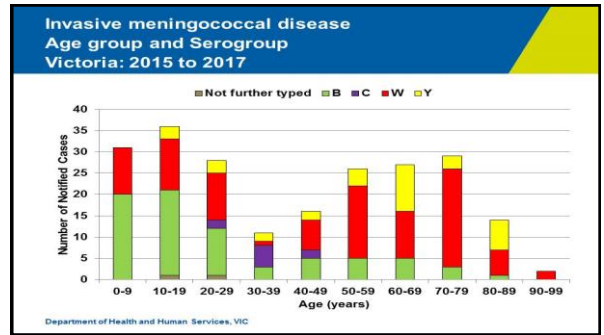
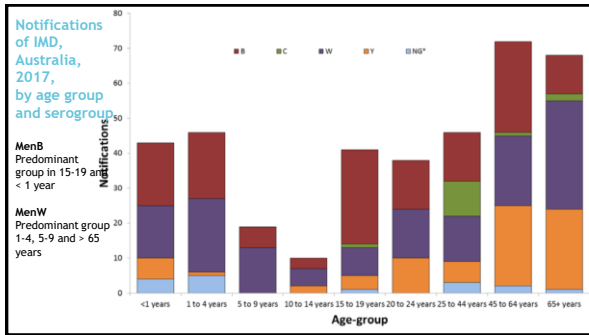
State or territory	Notifications							Total	Rate (per 100,000 population)
	A	B	C	W	X	Y	NG*		
ACT	0	0	0	0	2	0	2	0	0.5
NSW	0	43	5	19	0	16	8	91	1.2
NT	0	3	0	28	0	3	0	34	13.9
QLD	0	26	0	16	0	23	4	69	1.4
SA	0	22	0	11	0	4	0	37	2.2
TAS	0	6	0	8	0	1	1	16	3.1
VIC	0	26	8	35	0	18	2	89	1.4
WA	0	12	1	23	0	8	1	45	1.8
<b>Australia</b>	<b>0</b>	<b>138</b>	<b>14</b>	<b>140</b>	<b>0</b>	<b>75</b>	<b>16</b>	<b>383</b>	<b>1.6</b>

### Men W increase

- 2017: 64% cases < 45 years - increase, were more > 45 years
- Cases: 17 2014, 34 2015 (doubled), 108 2016 (tripled) and 140 2017
- Increase in cases in children aged <5 years since 2015
  - < 1 year: usually 2 cases/year: 2017 15 cases (x 7)
  - 1-4 years: usually 4 cases/year: 2017 21 cases (x 5.5)
- MenW strains in Australia belong to hypervirulent sequence type ST 11 - part of the clonal complex 11 (CC 11)
  - higher risk of invasive disease
  - higher case fatality rate: 11.4% 2017 cw 5.9% MenB
  - Most deaths in 2017 due to MenW: 16 (57%) vs 8 MenB (29%)

### Notifications and rates of MenW, Australia, 2014 to 2017, by state and territory

Year	ACT	NSW	NT	QLD	SA	TAS	VIC	WA	Australia
	Notifications								
2014	0	7	0	3	0	1	4	2	17
2015	0	8	0	4	0	1	17	4	34
2016	1	25	0	13	5	4	48	12	108
2017	0	19	28	16	11	8	35	23	140
Rate (per 100,000 population)									
2014	-	0.1	-	0.1	-	0.2	0.1	0.1	0.1
2015	-	0.1	-	0.1	-	0.2	0.3	0.2	0.1
2016	0.2	0.3	-	0.3	0.3	0.8	0.8	0.5	0.4
2017	0.0	0.2	11.4	0.3	0.6	1.5	0.6	0.9	0.6



- ### Men W geographical distribution
- 140 cases 2017 reported across jurisdictions
    - 0% in Australian Capital Territory (ACT)
    - Northern Territory had highest rate of IMD due to MenW in 2017
      - Men W accounted for 82% cases (28 out of 34 cases)
    - Huge jump in IMD cases 2017: 34 compared to 2 in 2016 and 1 in 2015 and 3 2014
    - Targeted MenACWY vaccine program started Nov 1 2017
  - Central Australia outbreak
    - Outbreak MenW Sep 2017 in Central Australia, Barkly and Katherine regions; and parts of Queensland (QLD), South Australia (SA) and Western Australia (WA)
  - Overall rate Men W indigenous vs non-indigenous: 7 vs 0.4/100,000



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### Meningococcal disease and vaccines

Meningococcal disease is caused by the bacteria *Neisseria meningitidis*. There are 12 known sub-types and of those, 5 are currently vaccine preventable (B and A, C, W, Y). In 2017, the main serotypes causing disease in Australia are **B, W and Y**, with variations noted by state. Importantly, they are all potentially vaccine preventable.

People with meningococcal disease can become extremely unwell very quickly. Invasive meningococcal disease (IMD) can cause meningitis (inflammation of the membrane covering the brain and spinal cord), septicaemia (infection in the blood) as well as other infections like pneumonia (lung infection), arthritis (inflammation of the joints) and conjunctivitis (eye infection). Mortality (death) can be as high as 5-10% and permanent lifelong complications can occur in 10-20% of those who survive. Disease is transmitted via respiratory droplets (sneezing and coughing etc.).

**Prevention of meningococcal infection**

There are vaccines available on prescription for meningococcal B and meningococcal ACWY in all age groups, including babies and young children.

**Meningococcal C**

Meningococcal C vaccine has been free through the National Immunisation Program in Australia since 2003. It is currently administered at 12 months of age as Menitorix® (16b: MenC) vaccine.

**Meningococcal B**

Bexsero® is the only vaccine for meningococcal B currently registered for use in Australia and is not currently funded through the National Immunisation Program (NIP).

- ### Vaccine recommendations
- 4cMenB (Bexsero)**
- Only vaccine for meningococcal B currently registered for use in Australia and is not currently funded through the National Immunisation Program (NIP)
- The ATAGI position statement recommends 4cMenB vaccine in groups that have the highest risk of disease:
- Infants < 2-years
  - Adolescents 15-19 years
  - Infants, children and adolescents with asplenia or complement deficiency

## Vaccine recommendations

### Dose

- Infants < 6 month: 3 doses (2-months apart) + 1 booster\*
- 6 to 11 months: 2 doses + 1 booster\*
- > 12 months: 2 doses (2-months apart)

Paracetamol - 30 minutes before vaccination, 2 more doses post vaccination 4 to 6 hours apart for all children < 4 years of age

Can be administered at the same time as other NIP and meningococcal vaccines

## Bexsero dosing schedule

Recommended MenB vaccine (Bexsero) schedule (by age) \*reference The Australian Immunisation Handbook

Age at commencement of vaccine course	Number of doses required for primary immunisation	Recommended interval between primary doses	Recommended age for single booster dose
6 weeks – 5 months	3 doses	8 weeks	12 months
6-11 months	2 doses	8 weeks	12 months, or 8 weeks after previous dose, whichever is later.
≥12 months	2 doses	8 weeks	No booster required

MVEC: Mebourne Vaccine Education Centre

## Vaccine recommendations MenACWY

### NIP recommendations

To be introduced at 12 months in 7 July 2018 and considered by PBAC in March 2018 for all adolescents

Since 2017: 15-19 year old school based program

Targeted programs 1-19 years in NT and QLD post outbreak

**Also recommended for:** anyone unimmunised against Men W but those at greatest risk include:

- Adults ≥ 55 years
- **15-24 year olds**
- **< 5 years**
- Pre-existing medical conditions, occupational exposures/travel

## Vaccine recommendations - NT

In response to MenW outbreak in Alice Springs, Barkly and Katherine, from 1 Nov 2017 and now expanded Jan 2018:

**MenACWY funded for all people aged 12 months to 19 years who have not already received the MenACWY vaccine and who are residents of:**

- Top End Remote region including Nhulunbuy
  - Katherine region including Katherine town
  - The Barkly region including Tennant Creek
  - Alice Springs region including Alice Springs town
  - Boarding schools, residential care facilities and correctional services in all of the NT
- On 1 December 2017, MenACWY replaced the MenC vaccination (Menitorix®) given at 12 months of age on the NT Childhood Vaccination Schedule for all children in the Northern Territory

## Vaccine recommendations

### Currently 3 Meningococcal conjugate ACWY vaccines (4vMenCV)

- Menveo® (bioCSL/Novartis) - For use from 6 weeks of age
- Nimenrix® (Pfizer) – For use from 6 weeks of age
- Menactra® (Sanofi) - For use from 9 months of age
- Men ACWY Polysaccharide vaccines - withdrawn

A private script is required to purchase the vaccine if not received as part of the NIP program at 12 months, the adolescent school program or due to an underlying special risk indication

## Vaccine recommendations

### Doses

**Infants: < 12 months** (Menveo licensed in Australia)

- 2-6 months: 3 doses (2-months apart) + 1 booster 12 months
- 7-8 months: 2 doses (2-months apart) + 1 booster 12 months
- 9-11 months: 2 doses (2-months apart) + 1 booster 12 months

**12 months:**

- Menveo: 2 doses (2-months apart)
- Nimenrix 1 dose +to introduced onto NIP

**2 years:** 1 dose (Menveo, Nimenrix, Menactra)

## Vaccine recommendations - NT

### WHICH VACCINE AND WHAT DOSE IS USED FOR THE FUNDED MENINGOCOCCAL ACWY EXPANDED PROGRAM?

Age at commencement of vaccine course	Men ACWY vaccine to be used	Number of immunisations*
12 months to less than 24 months	Nimenrix® 0.5ml IMI	1 dose
2 years -19 years	Menactra® 0.5ml IMI	1 dose

\*If the person has HIV infection, a stem cell transplant or a defect/deficiency in complement components or no longer has a spleen more doses may be needed. Refer to the Australian Immunisation Handbook

Free meningococcal ACWY immunisation (Menactra®) program commenced in 2017 school year - single vaccine dose for students 15 to 19 years

### State based meningococcal vaccination programs commencing in 2017, predominantly school-based.



## Take home messages



Meningococcal disease is rare but can have devastating consequences in children

There has been an increase in MenW cases in Australia since 2013 and changes to the NIP at 12 months and 15-19 years for MenACWY

4cMenB vaccine not currently funded on the NIP - ? be introduced < 12 months

Both MenACWY vaccines and 4cmenB vaccines should be discussed with parents of children < 5 years and teenagers



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## Acknowledgements

- Janet Strachan, Epidemiologist Communicable Disease Epidemiology and Surveillance, Health Protection Branch, Department of Health and Human Services, Victoria
- Melbourne Vaccine Education Centre - MVEC: <http://www.mvec.vic.edu.au>



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# Thank you

