

The Immunisation Coalition's  
mission:

Protect Australians against  
infectious diseases

Advocate for immunisation

Fight the misinformation from  
antivax groups with science  
based medical facts.

The Immunisation Coalition's

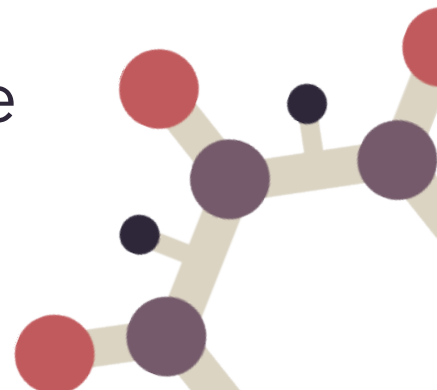
# 2021 Meningococcal Disease Webinar



# Questions & Answers



- ❁ Please type any questions for the speakers in the Q&A box throughout the meeting.
- ❁ A certificate of attendance will be sent to your email (minimum 50-minute attendance) in the coming weeks.
- ❁ A recording of this event will be available on the Immunisation Coalition's website soon.

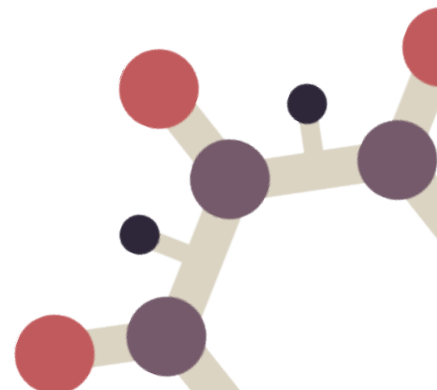


## Audience Poll



☼ Please indicate the profession or expertise area that most closely represents your background.

1. GP / Medical Practitioner
2. Nurse / Midwife
3. Researcher / Educator
4. Pharmacist
5. Other healthcare worker
6. Other





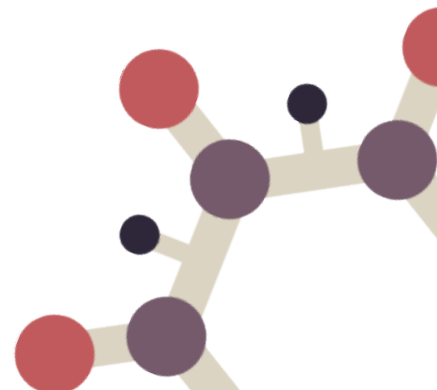
# Angela Newbound

Immunisation Specialist &  
Immunisation Coalition Member

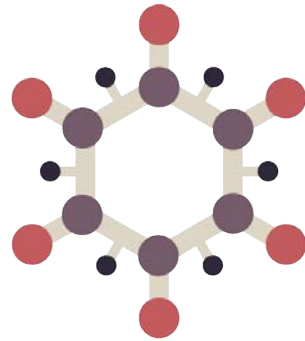


# Genni Brown

Registered Nurse and Midwife &  
Immunisation Coalition Member



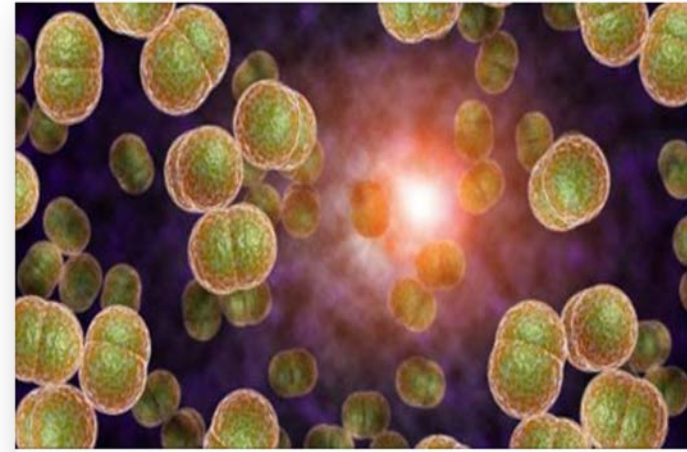
# Meningococcal Disease



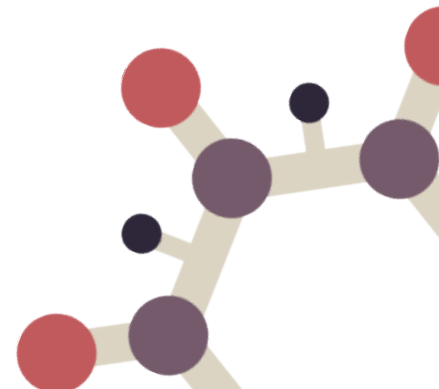
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# Neisseria meningitidis and meningococcal disease

- Meningococcal disease is a **rare but often life-threatening disease**
- The bacterium **Neisseria meningitidis** causes meningococcal disease
- There are 13 known serotypes of Neisseria meningitidis
- Globally, **strains A, B, C, W and Y** most commonly cause disease
- ❄ Currently **Men B** and **Men W** account for similar amounts of disease and cause the **majority** of IMD in Australia



Neisseria meningitidis



# Cause of disease

## MenB

- **Now the dominant strain**
- 📄 **123** cases 2018
- 📄 **101** cases (of 202 lab confirmed IMD) in 2019

## MenW (also known as **strain W135**)

- 📄 **101** cases in 2018
- 📄 **53** cases (of 202 lab confirmed IMD) in 2019

## MenC

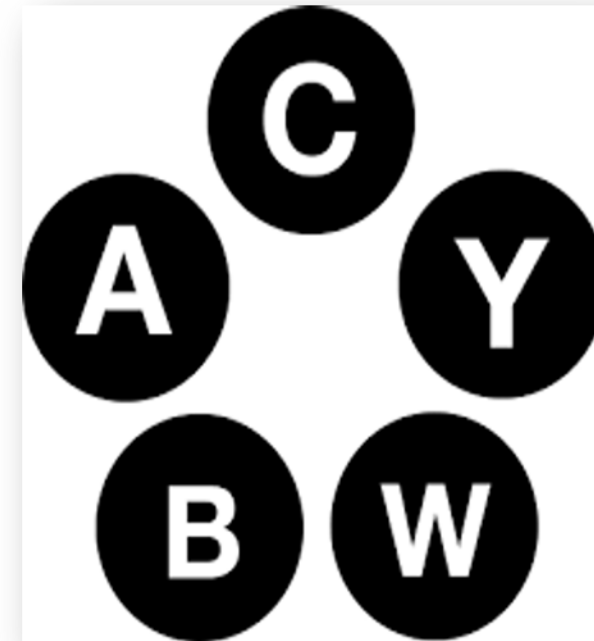
- Has become **rare** since introduction of MenC to NIP in 2003
- 📄 **4** cases in 2018
- 📄 **6** cases (of 202 lab confirmed IMD) in 2019

## MenY

- 📄 **44** cases 2018
- 📄 **42** cases (of 202 lab confirmed IMD) in 2019

## MenA

- Disease remains **rare** in Australia



# How is meningococcal disease spread?

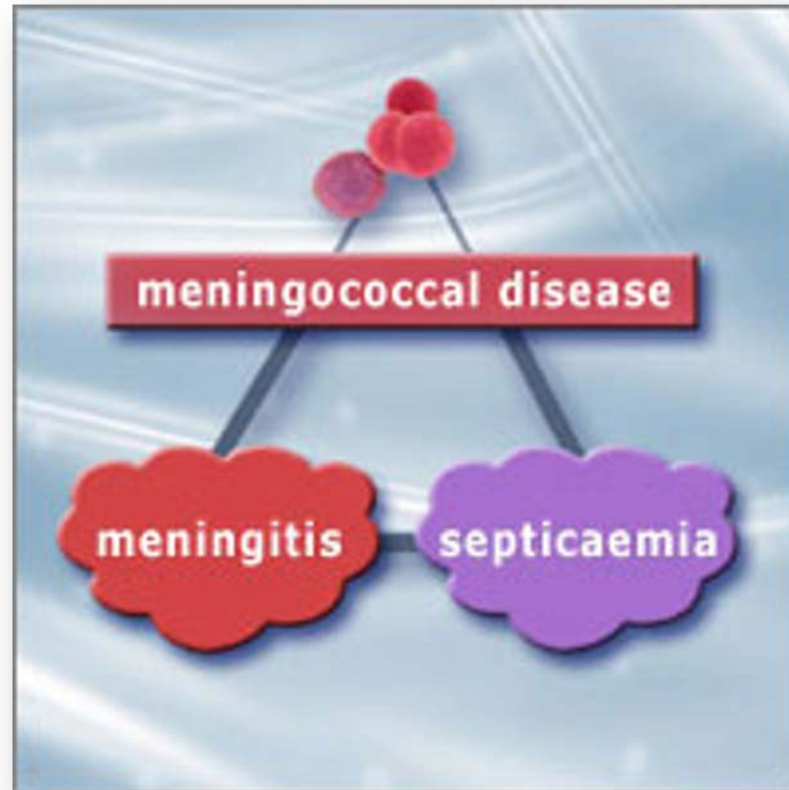
- Meningococcal disease is spread by **respiratory droplets (by coughing, sneezing, kissing)**
- Risk increases with **regular prolonged close contact** such as **living in the same household or intimate kissing**
- Only carried and transmitted by **humans**
- **Peak carriage rates (> 20%)** occur in **older teenagers**
- **5-25 %** carry meningococcal bacteria in their throat or nose which rarely cause illness



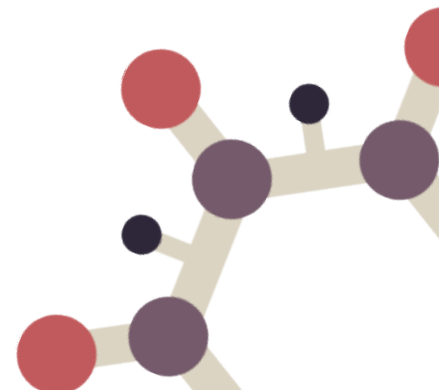


# Symptoms

## Meningococcal Disease



Ref: Image from Amanda Young Foundation



# Symptoms

## Invasive Meningococcal Disease

Invasive infection

- often presents as **septicaemia** or **meningitis** which is a medical **emergency**

In Australia, **Men W**:

- presented with **sepsis** more often than meningitis

**Men W**

- also associated with **atypical** presentations such as **septic arthritis**, **epiglottitis**, in up to 20% of cases

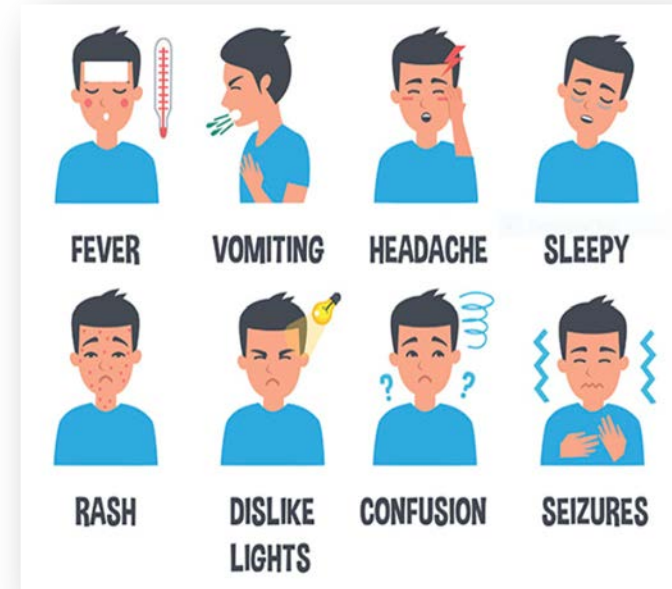


# Symptoms

- Can become **extremely unwell very quickly**
- Symptoms can become **life threatening within hours**
- Feel **sicker than** they have **ever** felt before
- Symptoms usually appear within **1 to 10 days**

Possible symptoms:

Sudden onset of fever, rash, headache, neck stiffness, sensitivity to light, muscle aches, cold hands and feet, confusion, irritability, joint pain, nausea and vomiting



# Symptoms

Symptoms	Septicaemia	Meningitis
Fever and/or vomiting	✓	✓
Severe headache		✓
Limb joint muscle pain	✓	
Cold hands and feet/chills	✓	
Pale or mottled skin	✓	
Breathing fast/breathless	✓	
Rash	✓	✓
Stiff neck		✓
Dislike of bright lights		✓
Very sleepy/vacant	✓	✓
Confused	✓	✓
Seizures		✓

Ref: Centers for Disease Control and Prevention (CDC) Meningococcal Disease Fact sheet April 2017. Meningitis Research Foundation Symptoms of meningitis and septicaemia (Accessed 22<sup>nd</sup> August 2017)



# Symptoms

## The Rash

Rash indicates **bleeding under skin**

❓ critical symptom of **severe septicaemia**

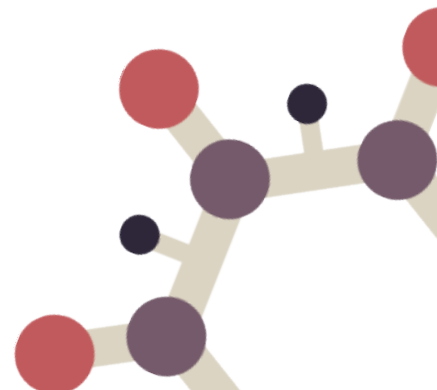
- May **start** as simple **spot** or **blister**
- May **progress** to **red pin pricks**
- **Spreads** quickly to **purple bruise like blotches**
- Rash does not disappear with gentle pressure on the skin



## Poll 1

Is a rash always present in people with meningococcal disease?

- A. No
- B. Yes
- C. If it is going to appear, it will appear early in the disease



# Symptoms in babies

Babies often don't have many of the classical symptoms but may be:

- Febrile
- Slow or inactive
- Unsettled
- Drowsy
- Floppy
- Not feeding
- Bulge in the anterior fontanelle



# Complications

- Meningitis (infection of the lining around the brain)
- Septicaemia (a serious blood infection)
- Joint infection
- Lung infection
- Permanent brain damage
- Death in up to 10%

1 in 5 who recover may have **lingering health problems:**

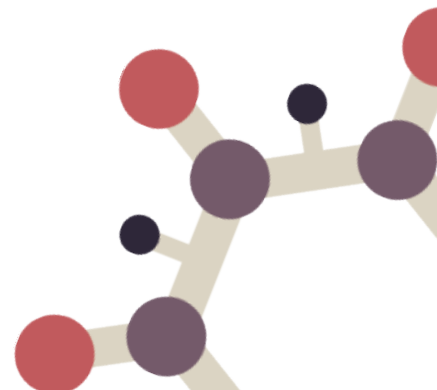
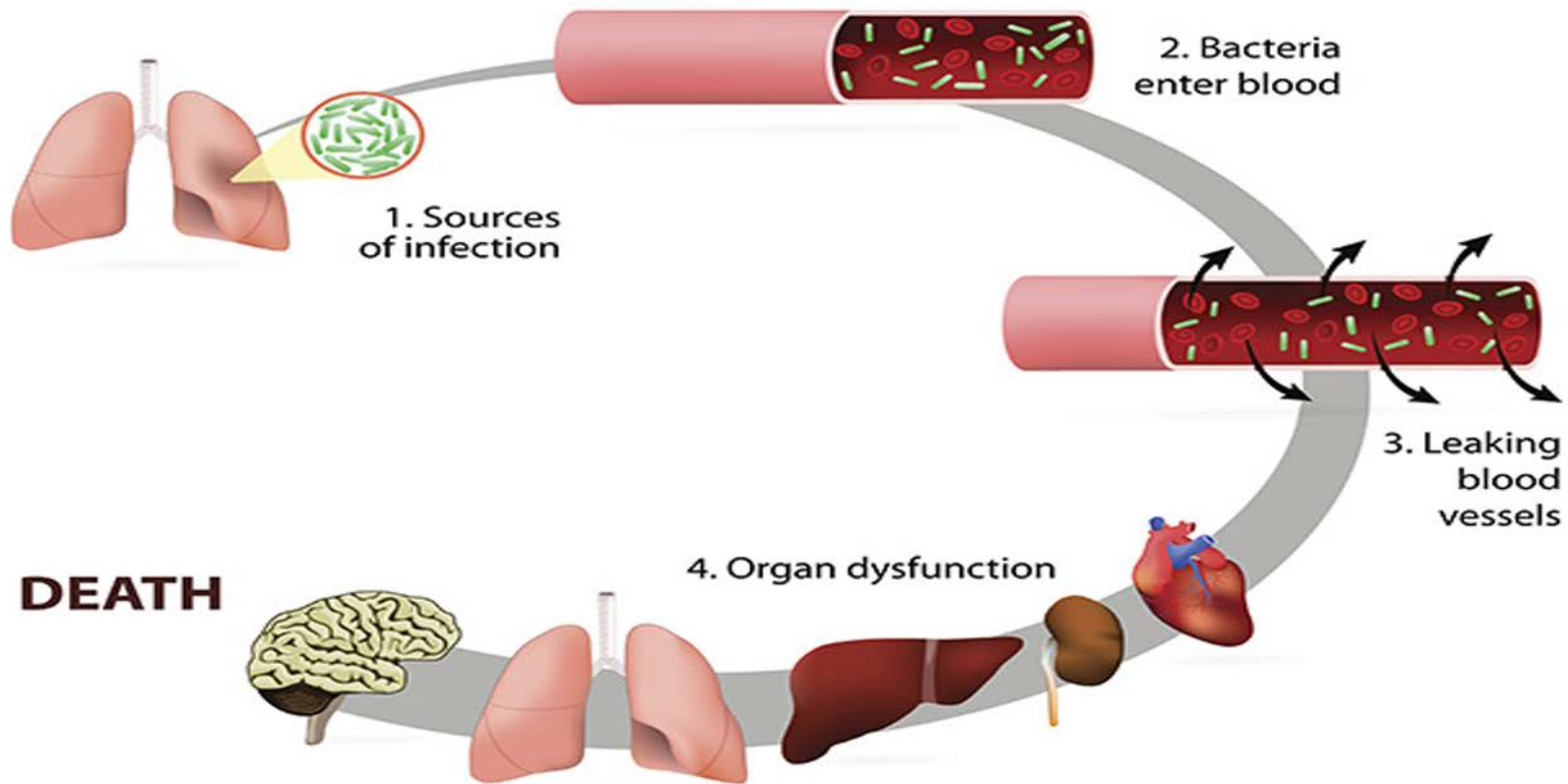
- Skin scarring (1 in 30)
- Limb deformity
- Deafness
- Blurring and double vision
- Learning difficulties





# Progression of sepsis

## Sepsis



# Who is most affected?

Most meningococcal disease occurs in:

- Young children **less than 2 years** of age
- Adolescents aged **15-19**
- Carriage rates are highest in **older adolescents/young adults**

## MenB disease:

- Most common cause of IMD in children, adolescents and young adults
- 29% admitted to ICU (2018)

## MenW:

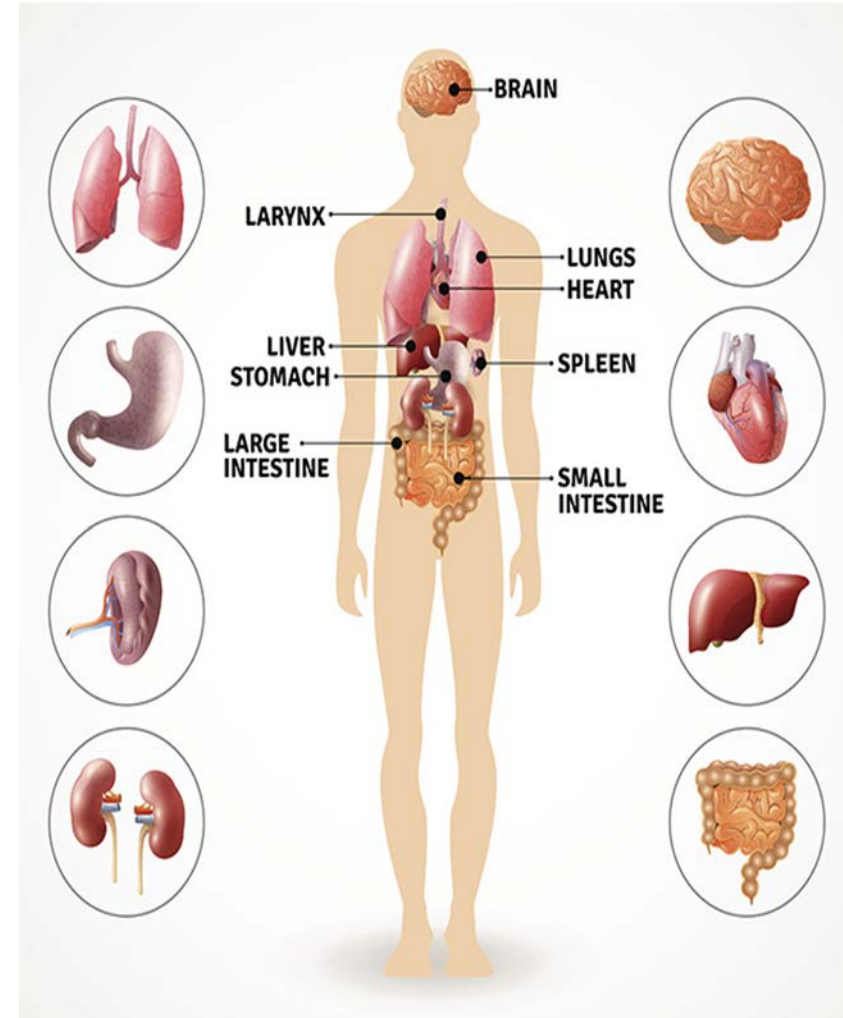
- Reported in all age groups **except 10-14**



# Risk factors

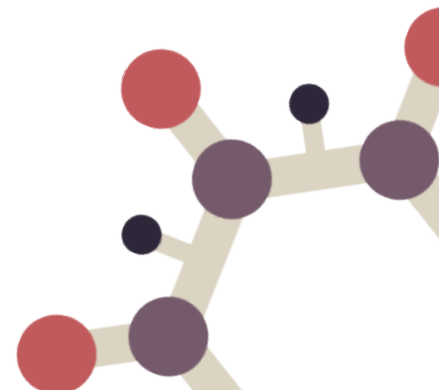
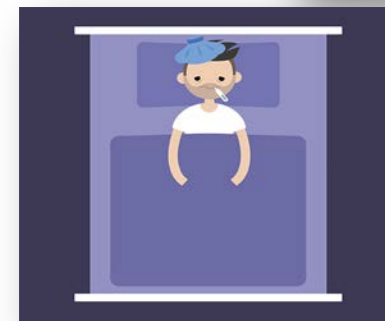
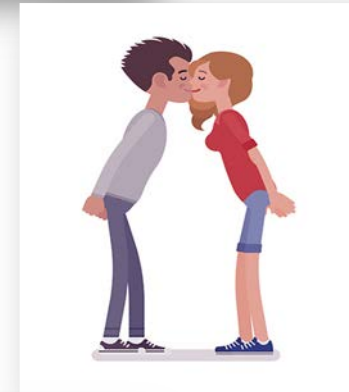
## Immunocompromised due to:

- Certain disorders of the immune system (particularly **complement deficiencies**)
- ❑ HIV infection
- ❑ Haematopoietic stem cell transplant
- **Certain medical treatments** (e.g. eculizimab)
- **Asplenia**



# Risk factors

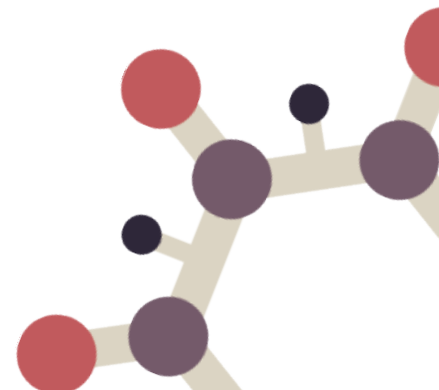
- Having a chronic disease
- Exposure to **smokers** (who are more likely to be carriers)
- Being a **current smoker**
- Attending **school or university**
- **Intimate kissing** with multiple partners
- Recent or current **viral infection**



# Burden of disease

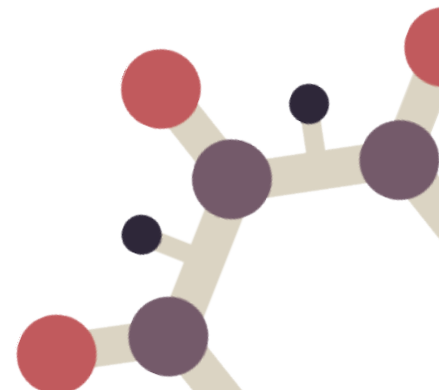
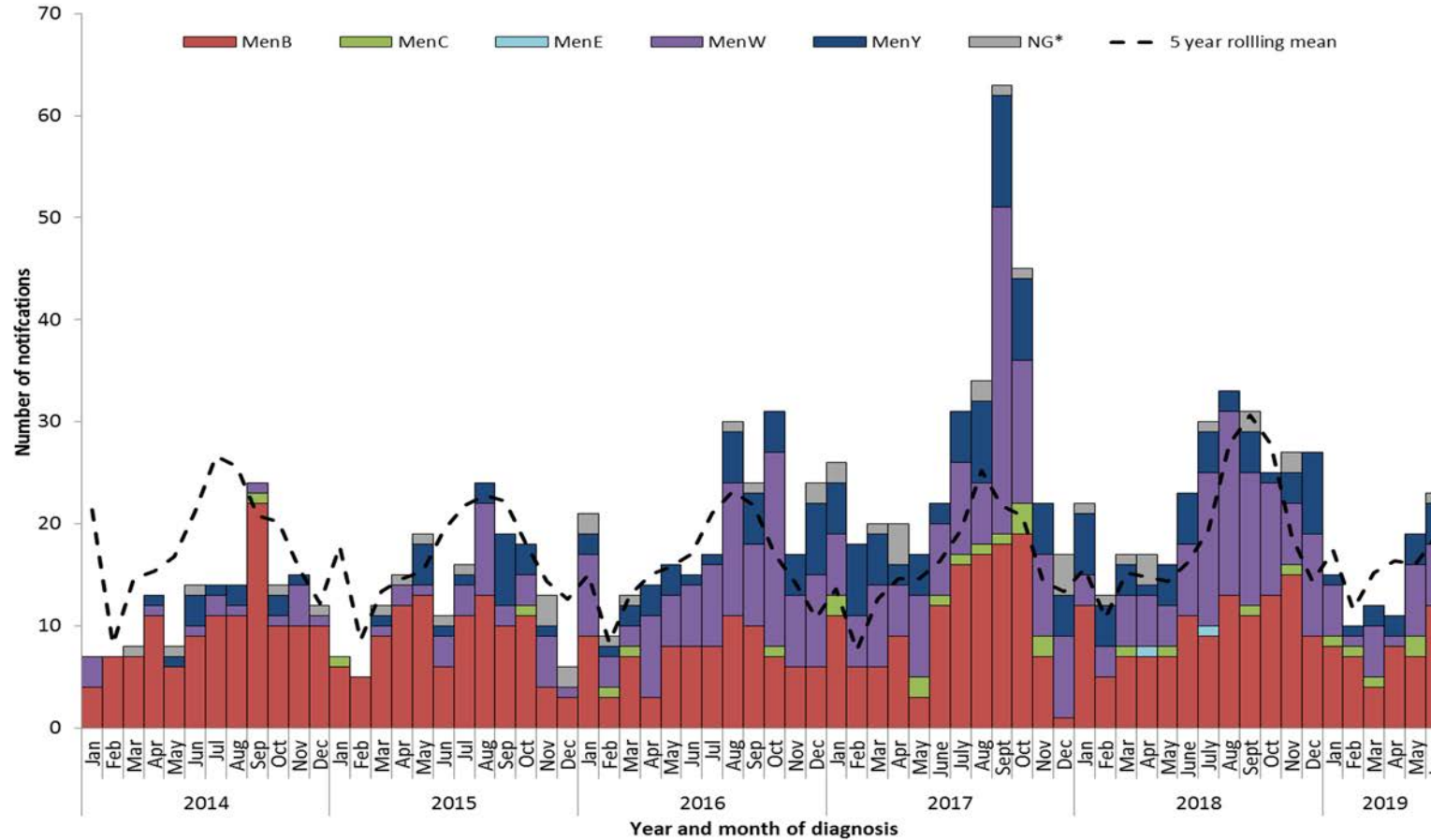
## National notification rates

- Meningococcal disease notification rates **decreased from 2002 to 2013**
- Notification rates **increased from 2014** mainly due to an increase in **MenW** disease
- **MenACWY** vaccination programs has seen cases decline slightly in 2018, however **MenB and MenW cause the majority of IMD** in Australia
- ✿ The burden of IMD due to **MenW and MenB** is disproportionately higher in Aboriginal and Torres Strait Islander people, particularly in those aged <15 years.

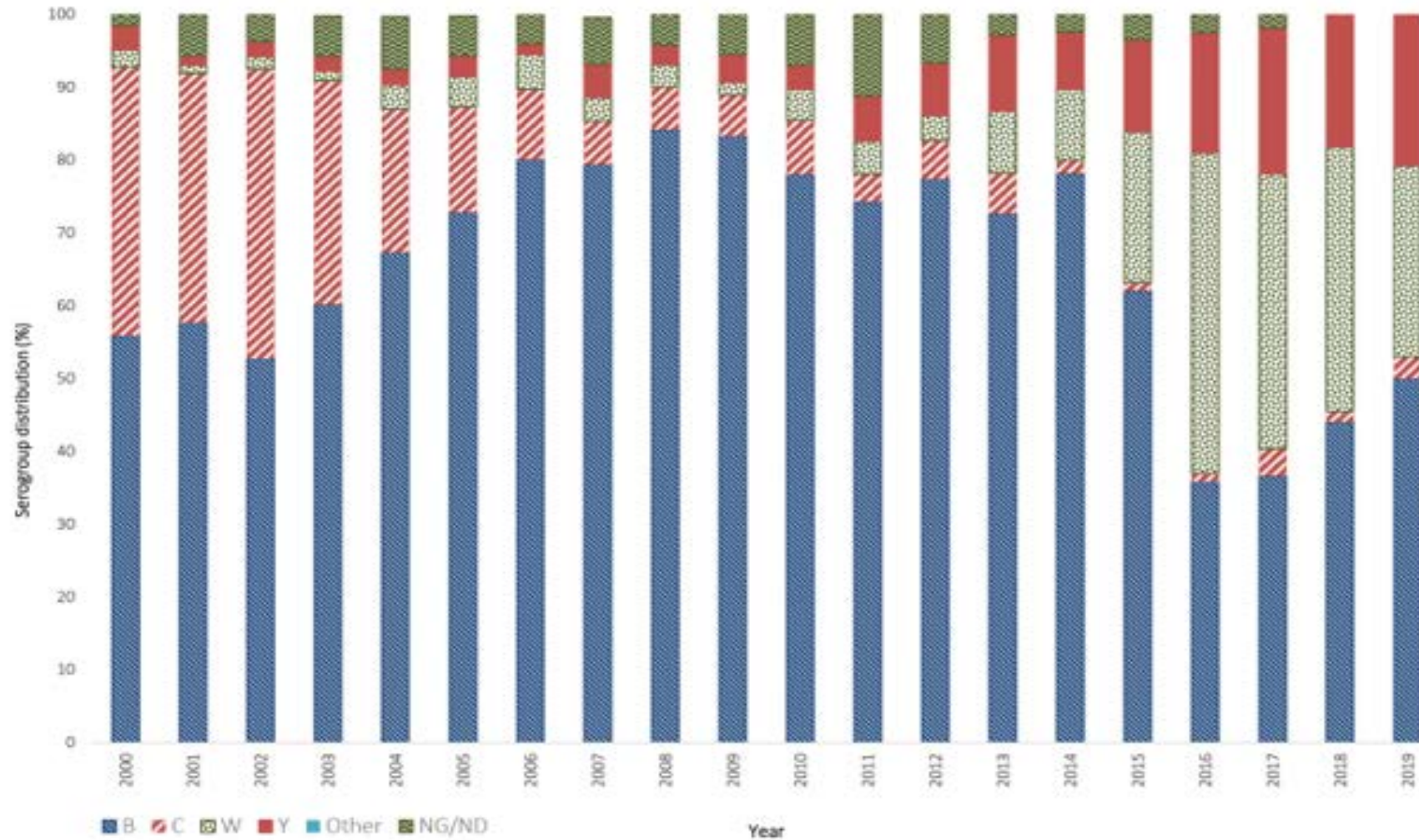


# When is it most prevalent?

Cases of IMD, Australia, 1 January 2014 to 30 June 2019, by serogroup, month and year of diagnosis



# National notification rates for invasive meningococcal disease by serogroup, Australia 2002-2019



Ref: *Commun Dis Intell* (2018) 2020 44

<https://doi.org/10.33321/cdi.2020.44.62> Epub 17/8/2020 - Accessed 22nd



# Deaths in Australia 2015-2019

Deaths in Australia are beginning to decline:

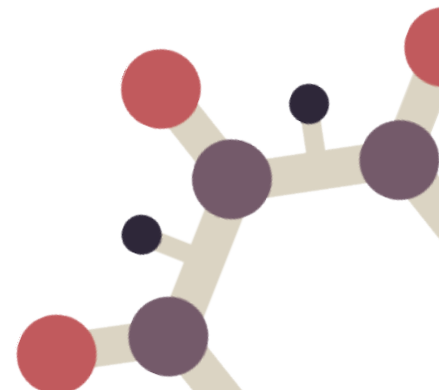
2015: 12

2016: 11

2017: 28

2018: 16

2019: 5 (as at 30 June 2019)



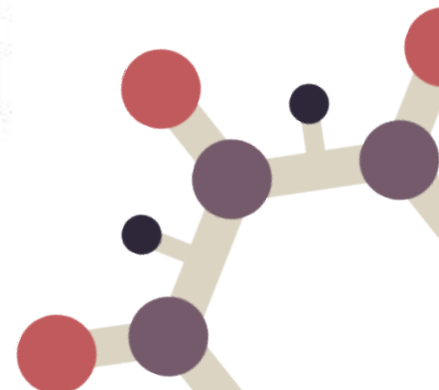


# Where is it most prevalent?

**Table 1. Notifications and rates of IMD, Australia, 1 January to 30 June 2019, by serogroup and state and territory**

State or territory	Notifications						Total	Rate (per 100,000 population)
	B	C	E	W	Y	NG*		
ACT	1	0	0	0	0	0	1	0.2
NSW	13	0	0	4	2	0	19	0.2
NT	1	0	0	4	0	0	5	2.0
QLD	10	0	0	2	7	0	19	0.4
SA	8	0	0	2	2	0	12	0.7
TAS	2	0	0	2	0	0	4	0.8
VIC	8	0	0	8	2	0	18	0.3
WA	3	5	0	3	0	0	11	0.4
<b>Australia</b>	<b>46</b>	<b>5</b>	<b>0</b>	<b>25</b>	<b>13</b>	<b>0</b>	<b>89</b>	<b>0.4</b>

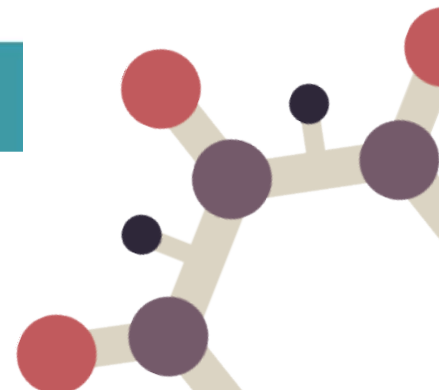
*\*NG includes where meningococcal isolates could not be identified ('not groupable'), other isolates not grouped and where serogroup was not known.*



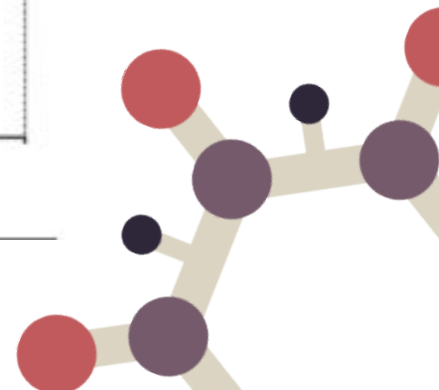
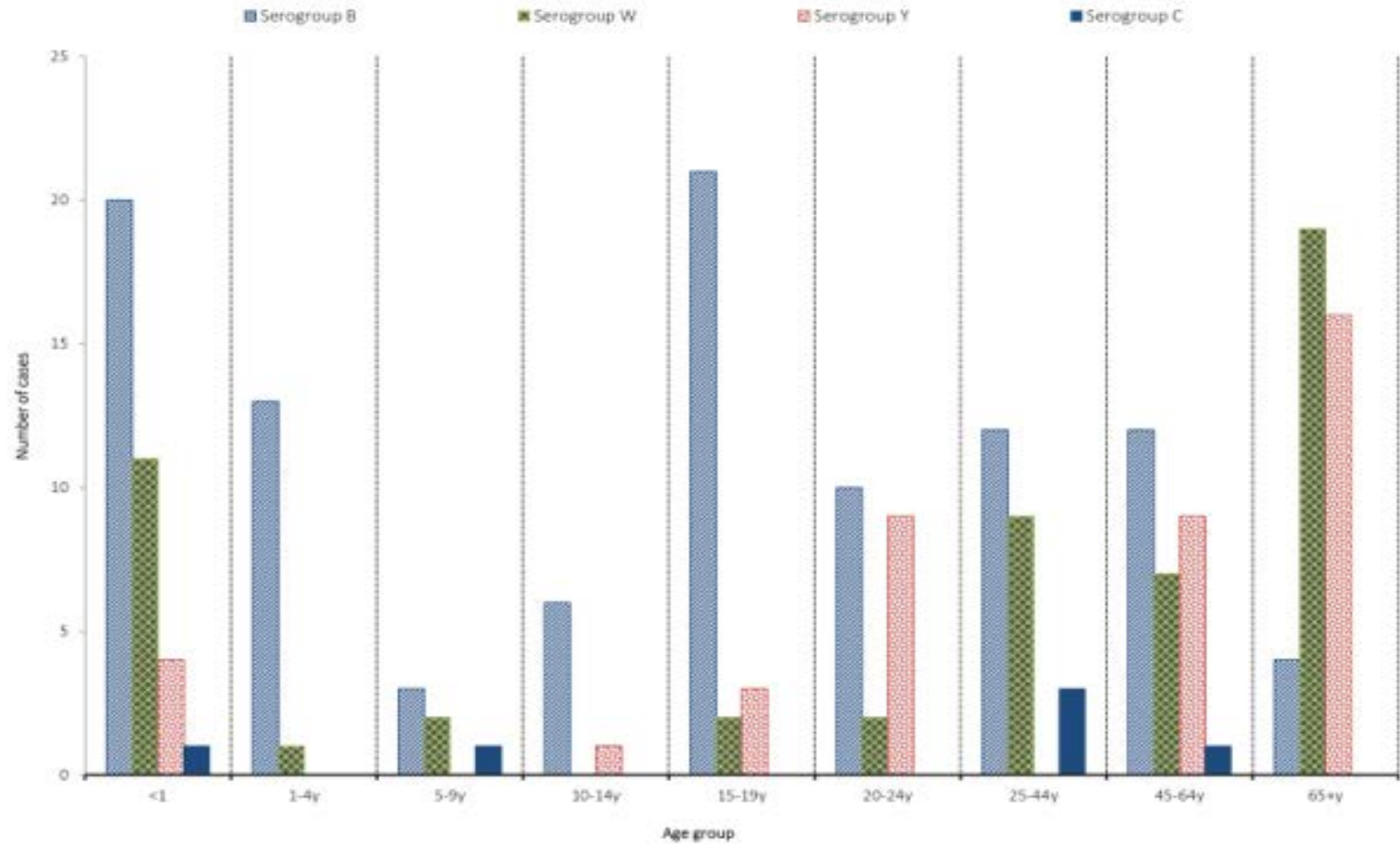
# Cases of Invasive Meningococcal Disease by state in Australia

Notifications of IMD reported in 2020, varied across states

Location	Notifications
ACT	1
NSW	22
NT	2
QLD	27
SA	5
TAS	3
VIC	19
WA	11
Australia	90



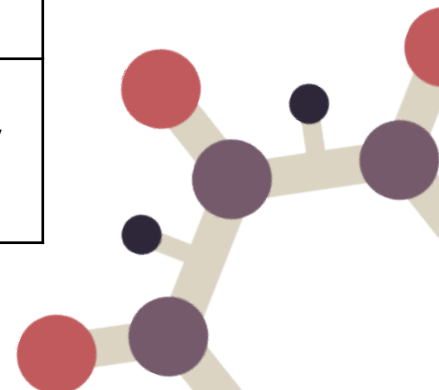
# National notifications for serogroup B, C, Y and W, Australia 2019, by serogroup and age group



# Prevention Vaccines

Three types registered in Australia

Type	Brands	Strains covered	Age recommendation*
<b>Quadrivalent (A,C,W, Y) meningococcal conjugate vaccines</b>	<b>Menveo</b>  <b>Nimenrix</b>  <b>Menactra</b>	<b>A,C,W, Y</b>	<b>Menveo</b> <ul style="list-style-type: none"> <li>• 6 weeks of age</li> </ul> <b>Nimenrix</b> – from 6 weeks of age (NIP funded at 12 months)  <b>Menactra:</b> <ul style="list-style-type: none"> <li>• from 9 months of age</li> </ul>
<b>Meningococcal C conjugate vaccine (MenCCV)</b>	<b>NeisVac-C</b> (single vaccine)  <b>Menitorix</b> (in combination with Hib vaccine)	<b>C</b>	The ATAGI recommends meningococcal C vaccination is routinely not recommended before 12 months of age (unless specifically indicated).
Multicomponent <b>meningococcal B</b> vaccine	<b>Bexsero</b>  <b>Trumbena</b>	<b>B</b>	<b>Bexsero</b> – from 6 weeks of age <b>Trumbena</b> – from 10 years of age only



## Poll 2

How are Menveo and Nimenrix vaccines administered to the patient?

- A. In a liquid form and simply drawn up and administered by IM injection
- B. Consists of a powder and a liquid which need to be combined before they are administered by IM injection
- C. An oral formulation
- D. Are best administered 2 months after other vaccinations have been given

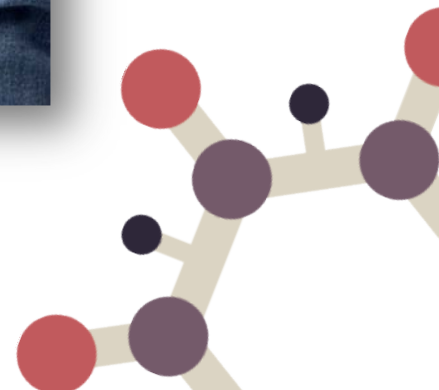


# Who should be vaccinated?

## Quadrivalent meningococcal conjugate vaccines (A,C,W, Y) 4vMenCV

- Adolescents/young adults (15-19 year olds)
- Aboriginal and Torres Strait Islander people aged 2 months to 19 years
- People with medical conditions associated with an increased risk of IMD
- Travellers
- People who have occupational risk
- Anyone  $\geq$  2 months who wants to reduce risk

**Availability: Private prescription for non-NIP eligible cohorts**



## Poll 3

A 5-year-old child presents for catch-up vaccination. You note the child received Menitorix vaccine at 12 months of age.

Would you offer a dose of Meningococcal ACWY vaccine?

- A. Yes, as it is funded on the NIP
- B. No, as it is not funded on the NIP
- c. Yes, but on private prescription



# Who should be vaccinated?

## Meningococcal ACWY conjugate vaccines (MenCCV)

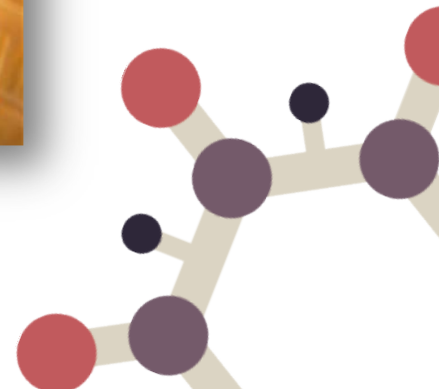
### Nimenrix funded under NIP for:

- **All children at 12 months (from 1<sup>st</sup> July 2018)**
- **14 – 19 year old adolescent program (from 1<sup>st</sup> April 2019)**
  - **adolescents aged 14 to 16 years as part of the SIP**
  - **adolescents aged 15 to 19 years who missed the vaccine at school can access the vaccine at their GP or primary care provider.**



Ref.: Australian Technical Advisory Group on Immunisation (ATAGI). *The Australian immunisation Handbook 10th ed* (2017 update). Canberra: Australian Government Department of Health, 2017.

Meningococcal vaccines for Australians/ NCIRS Fact sheet: March 2019





# Who should be vaccinated?

## Meningococcal B vaccines

- **Infants and young children** particularly those:
  - **< 2 years of age**
  - **Adolescents**
  - Those with **increased medical or occupational exposure**

**Vaccination:** anyone  $\geq 6$  weeks who wants to reduce risk

**Availability:** Private prescription

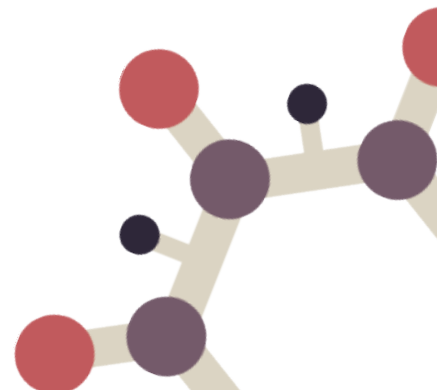
Funded vaccination in SA for adolescents\*



## Poll 4

Should pregnant women be immunised against meningococcal disease?

- A. Yes immunise with MenBV between weeks 28 to 32 of the pregnancy to protect the mother and the infant
- B. Yes immunise with 4vMenCV between weeks 28 to 32 of the pregnancy to protect the mother and the infant
- C. Yes immunise with MenCCV between weeks 28 to 32 of the pregnancy to protect the mother and the infant
- D. Meningococcal vaccines are not usually recommended for pregnant women but may be given in patients considered at high risk of developing the disease



# Vaccine effectiveness in adolescents

## 4vMenCV (A,C,W and Y)

- **Prevent** meningococcal disease in adolescents
- **Prevent spread** of meningococcal to the broader community (herd immunity)
- **Vaccine effectiveness** of a **4vMenCV adolescent vaccination** program in the United States:
  - ❑ consisting of a single dose
  - ❑ has been estimated at **80 to 85%**.



# Vaccine efficacy

## Meningococcal C conjugate vaccines (MenCCV)

- Use **from 2003** in Australia resulted in a **96% reduction in MenC invasive disease** in all age groups **by 2012**
- Evidence of indirect protective benefits (herd immunity) in non-vaccinated age groups



# Vaccine efficacy

## MenBV

Based on lab tests:

Estimated vaccine **induces protective antibodies against 76% of MenB** strains in Australia



# Vaccine Safety

## Meningococcal conjugate vaccines:

- Safe and well tolerated

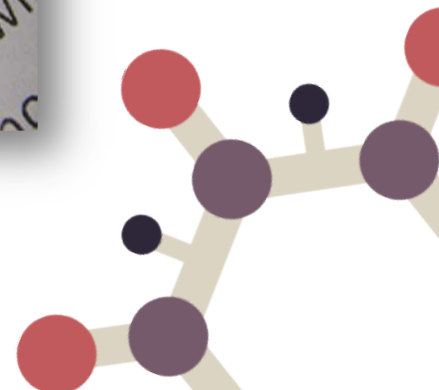
### **4vMenCV's** most frequent side effects:

Fever, headache, dizziness and erythema around injection site

Erythema resolves in 48-72 hours

### **MenCCV** common side effects:

Pain, tenderness and occasional erythema at injection site which resolves in 1 day, transient headache



# Vaccine Safety

## Multicomponent meningococcal B vaccine

### Side effects

**Fever** most common in infants and young children

- **Prophylactic paracetamol** with every dose MenBV to children <2 years of age

Other common side effects:

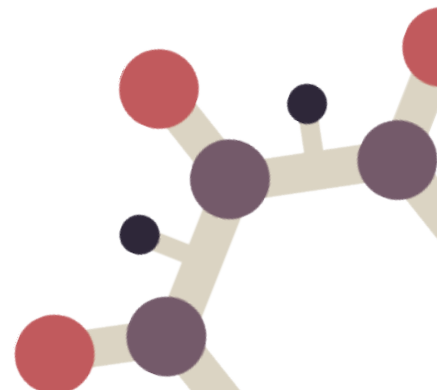
Tenderness, swelling and erythema around injection site, irritability, sleepiness, change in eating habits, unusual crying, rash, vomiting and diarrhea.

Side effects : mild or moderate and transient



Ref:: Australian Technical Advisory Group on Immunisation (ATAGI). *The Australian immunisation Handbook 10th ed* (2017 update). Canberra: Australian Government Department of Health, 2017.

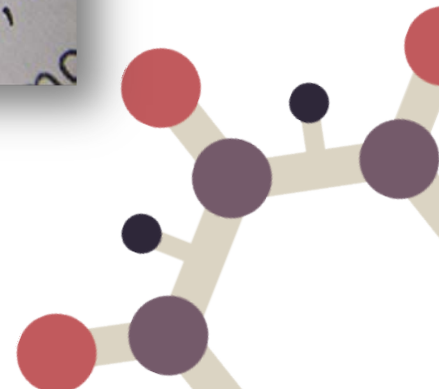
Meningococcal vaccines for Australians/ NCIRS Fact sheet: March 2017.



# Vaccine contraindications

The **absolute contraindications for all meningococcal vaccines** are:

- **anaphylaxis** following a **previous dose** of the respective vaccine or
- **anaphylaxis** following any **vaccine component**.



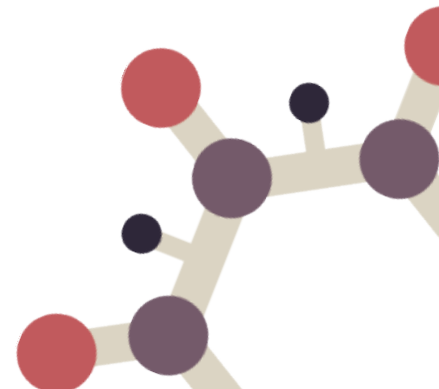


# Management of meningococcal disease

- Notifiable in all states/territories
- Prompt diagnosis and treatment
- Treated with parenteral antibiotics (usually penicillin) and referred to hospital for clinical management

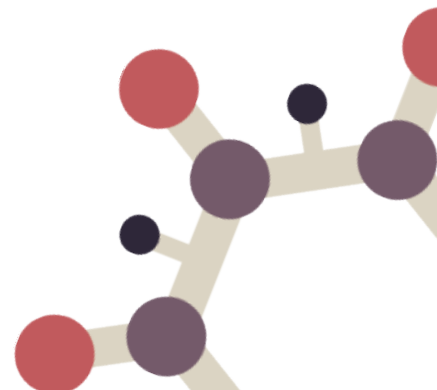


Ref.: Australian Technical Advisory Group on Immunisation (ATAGI). *The Australian immunisation Handbook 10th ed* (2017 update). Canberra: Australian Government Department of Health, 2017. Better Health Channel Meningococcal disease Fact Sheet (Accessed August 2017)



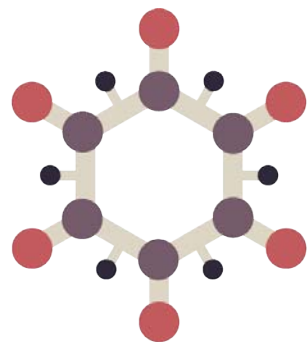
# Conclusions

- **Recent emergence of Men W** - a **hypervirulent strain** of meningococcal disease
- Up to **1 in 10 will die** from Meningococcal disease
- Meningococcal disease progresses **very rapidly**. In fatal cases, **deaths** can occur in as little as a **few hours**
- People who survive infection can develop **long term health problems**, including limb deformity, skin scarring, deafness and neurologic deficits
- Some of the highest rates of meningococcal carriage and illness are among **older teenagers**
- **Meningococcal vaccines** are available to protect against disease **strains A,B,C,W and Y**
- **Free meningococcal ACWY** vaccination program is available for **teenagers (15-19 years old)**



# Follow us for upcoming events

[www.immunisationcoalition.org.au](http://www.immunisationcoalition.org.au)



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**C O A L I T I O N**