

# About the Immunisation Coalition

Our mission is to protect Australians against infectious diseases by advocating for immunisation and fight the misinformation from antivax groups with science based medical facts.



# What we do:

- Create public awareness regarding the importance of immunisation by providing educational materials and communication programs.
- Co-operate with key Australian professional bodies, consumer groups and the Australian, State and Territory Governments in their educational activities focused on immunisation to bring information to Australian healthcare professionals and the public.
- Work with consumers, health professionals and organisations with an interest in immunisation, ensuring that the information provided to consumers through our website and other communication channels is current, easily understood and scientifically informed.

# Follow us

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

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# Influenza

Date of Preparation: March 2020



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# Influenza

## What is influenza?

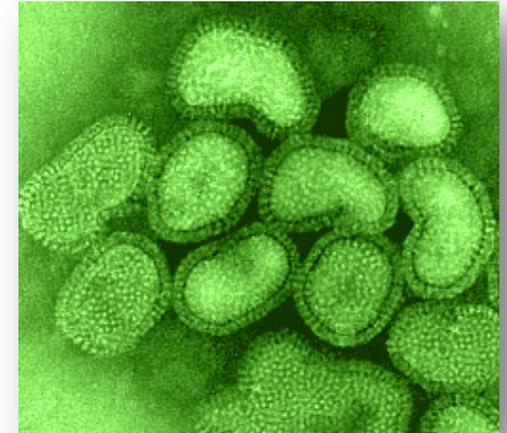
- Respiratory disease caused by influenza virus infection.

## Influenza infection can cause a wide spectrum of disease

- Minimal to no symptoms in some people.
- Respiratory symptoms with **systemic features** (i.e. involving the whole body) in others.
- In some patients **progression to** viral pneumonia or secondary bacterial **pneumonia**.
- In other patients **worsening** of an underlying **comorbidity** or precipitation of events such as myocardial infarction.

# Influenza viruses

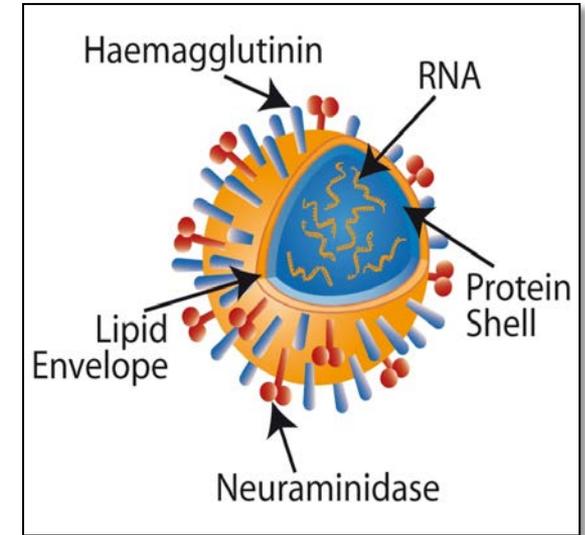
- During infection influenza virus enters the epithelial cells lining the airways. Replication of the virus leads to release of larger quantities of virus
- Influenza viruses have 2 surface glycoprotein antigens:
  - **Haemagglutinin (H)** – involved in cell attachment during infection
  - **Neuraminidase (N)** – facilitates the release of newly synthesized virus from the cell.



# Influenza viruses

## Influenza A and influenza B viruses undergo frequent changes in their surface antigens

- Stepwise mutations of genes coding for Haemagglutinin and Neuraminidase result in changes in surface antigens.
  - This leads to **new strains** and **repeated outbreaks** and **epidemics** of influenza.
  - Reason why the **composition** of influenza vaccines is **reviewed yearly**.



Influenza virus

# Influenza

## How does influenza spread?

- Via respiratory aerosols, droplets produced during coughing/sneezing, and direct contact with respiratory secretions containing influenza viruses deposited on surfaces.

## Typical course of influenza disease in symptomatic individuals

Incubation period of 1 to 3 days followed by abrupt illness, including:

- Cough, sore throat
- Feeling of discomfort (malaise)
- Fever
- Chills
- Headache
- Aching muscles (myalgia)

May also be accompanied by nasal discharge and sneezing



# Influenza

## Complications of influenza

- Acute bronchitis
- Acute otitis media
- Pneumonia
  - Primary viral pneumonia (rare)
  - Secondary bacterial pneumonia (frequent complication in individuals at high risk of influenza complications)
- Cardiovascular complications (e.g. myocardial infarction, myocarditis, pericarditis)
- Stroke
- Encephalopathy
- Reye syndrome
- Guillain-Barre syndrome
- Death from pneumonia or cardiac failure

# Burden of influenza disease



Annual influenza attack rates:  
typically 5-10% of the community  
In some years, may be up to 20%  
Paediatric levels are higher ~30%  
Influenza-like illness accounts for  
significant morbidity in the general  
population and substantial  
economic losses through  
increased healthcare utilisation  
and lost productivity

Estimated to be responsible per  
annum for approx:

1,500,000 lost work days

>300,000 GP visits

18,000 hospitalisations

1,500 - 3,000 deaths



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# Burden of influenza disease

## In Australia in 2019

- More than 300,000 confirmed influenza cases
- Over 29,000 hospitalisations (2017 figure)



# Who is at increased risk of complications from influenza infection?

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In 2017, 91% **deaths** were in people aged **over 65 years**.

Ref: Australian Influenza Surveillance  
Report 22 November 2017



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Who is at increased risk of complications from influenza infection?

**All older Australians and Aboriginal and Torres Strait Islanders**

- All individuals aged  $\geq 65$  years
- All Aboriginal and Torres Strait Islander People from six months and over



# Who is at increased risk of complications from influenza infection?

**Individuals ( $\geq 6$  months) with chronic conditions or other factors predisposing to severe outcomes from influenza**

- **Pregnant women**
- **Cardiac disease**
- **Chronic respiratory conditions**
  - COPD (chronic obstructive pulmonary disease) and chronic emphysema
  - Severe asthma
  - Suppurative lung disease, bronchiectasis, and cystic fibrosis
- **Other chronic illnesses** requiring regular medical follow up or hospitalisation in the preceding year, e.g.
  - Diabetes mellitus
  - Chronic renal failure
  - Chronic metabolic diseases
  - Haemoglobinopathies
  - Alcoholism



# Who is at increased risk of complications from influenza infection?

**Individuals ( $\geq 6$  months) with chronic conditions or other factors predisposing to severe influenza**

- Chronic neurological conditions that can compromise respiratory function
- Chronic liver disease
- Impaired immunity (e.g. HIV infection or malignancy)
- Preterm infants ( $< 37$  weeks gestation) with chronic lung disease, cardiac disease or neurological conditions
- Children aged 6 months to 10 years on long-term aspirin therapy
- Down syndrome
- Obesity ( $\text{BMI} > 40 \text{kg/m}^2$ )



# Who else is at risk from influenza infection?

## Others to consider:

- Every-one  $\geq 5$  years (even healthy individuals!) – note that  $\geq 6$ mths to  $< 5$ years is now funded under NIP
- Residents of RACF's and other long term care facilities
- Homeless people
- Commercial poultry or pork industry staff (during confirmed avian or swine influenza activity)
- Essential Services personnel
- Travellers



# Influenza infection and cardiac disease

## Cardiac diseases that increase the risk of severe influenza

- Cyanotic congenital heart disease
- Coronary artery disease
- Congestive heart failure



Increased rates of myocardial infarction and coronary death often occur during the influenza season.

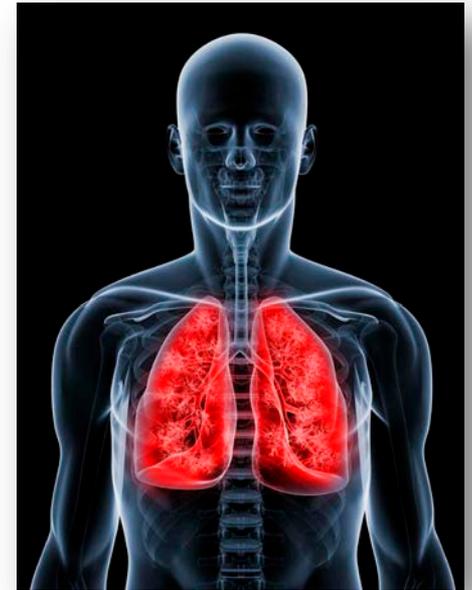
Pulmonary congestion in chronic heart failure patients predisposes them to increased risk of respiratory infections.

Patients with chronic heart failure are at increased risk of hospitalisations and death during the influenza season.

# Influenza infection and chronic lung disease

## COPD

- Patients with COPD are at increased risk for respiratory illness-related hospitalisation during influenza outbreaks.
- Influenza infection is an important cause of excess mortality and morbidity in COPD.
- Effective management of acute exacerbations of COPD can be challenging and so prevention strategies are preferred.



# Influenza infection and chronic lung disease

## Asthma

- Asthmatic children experience a significantly greater incidence of viral respiratory tract infections than do their non-asthmatic siblings of similar age.
- The course of illness was typically longer in the asthmatic siblings.
- Influenza can cause severe exacerbations of wheezing and about 10% of episodes of virus-induced wheezing are attributable to influenza.



## Suppurative lung disease, bronchiectasis, and cystic fibrosis

- Patients with these conditions are at increased risk of contracting influenza, which can lead to irreversible deterioration in lung function.

# Influenza infection and diabetes

## Increased risk from influenza infection in people with diabetes

- People with diabetes may develop more severe disease.
- Those with Type I or Type II diabetes are at increased risk of lower respiratory tract infections including influenza.
- Influenza infection may be associated with increased morbidity and mortality in people with diabetes.
- Factors such as malnutrition, blood vessel damage and other co-existing conditions (e.g. cardiovascular and chronic renal disease) can increase the risk of lower respiratory tract infections.

# Influenza infection and diabetes

## Deaths from influenza in people with diabetes

- A sizeable fraction (~10%) of deaths associated with influenza and pneumonia are attributable to diabetes.
- In the general population, people aged 25 to 64 years with diabetes were 4 times more likely to die with pneumonia and influenza than people without diabetes of comparable age, sex, race, and socioeconomic status.



# Pregnancy

- Pregnant women, and women planning pregnancy, are at increased risk of morbidity and mortality from influenza
- The risk of complications due to influenza increases during the later stages of pregnancy
- Selective suppression of immune components significantly increases the rate of serious illnesses and hospitalisations in pregnant women
- RANZCOG recommend the routine vaccination of pregnant women against influenza in every pregnancy
- Vaccination during pregnancy also provides protection for the neonate



# Influenza vaccination for travellers

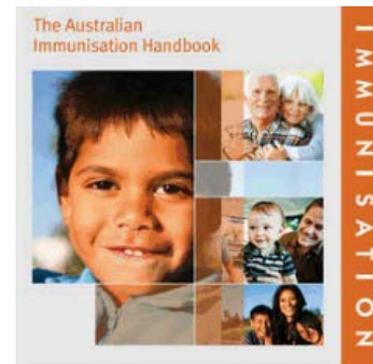
- Frequent vaccine preventable disease in travellers
  - Low rate all year round in the tropics
  - Peaks seasonally in Northern and Southern hemispheres
- Australian residents undertaking international travel has almost doubled
  - 2008: 5.1 million
  - 2018: 9.5 million
- Risk factors
  - Aeroplanes / Airport lounges etc
  - Cruise ships (majority elderly)
  - Hajj (~30% elderly)
  - Other mass gatherings:
    - FIFA World Cup, Olympics, Divali etc



# Influenza vaccination for at-risk groups: NHMRC recommendations

## The Australian Immunisation Handbook:

- Recommends annual influenza vaccination for any person aged  $\geq 6$  months wishing to reduce the likelihood of becoming ill with influenza.
- **Strongly recommends** influenza vaccination in groups at risk of severe influenza or complications from influenza.
- Advises that influenza vaccination should be actively promoted in these groups.



# Government-funded influenza vaccine for at-risk groups

## Free influenza vaccine is available through the National Immunisation Program Schedule for the following individuals at risk of severe influenza and its complications

- Individuals aged  $\geq 65$  years
- All children aged  $\geq 6$  months to less than 5 years.
- All Aboriginal and Torres Strait Islander people aged 6 months and over.
- Individuals aged  $\geq 6$  months with the following chronic conditions:
  - Cardiac disease
  - Chronic lung conditions
  - Other chronic illnesses requiring regular medical follow up or hospitalisation in the past year
  - Diabetes mellitus
  - Diseases of the nervous system that impact on respiratory function
  - Impaired immunity (e.g. HIV infection or malignancy)
- Pregnant women
- Children aged 6 months to 10 years on long-term aspirin therapy

# Influenza vaccination of at-risk groups – what the NHMRC says

**NHMRC's Australian Immunisation Handbook recommends:**  
*Annual vaccination of individuals at risk of complications of influenza infection is the single most important measure for preventing or attenuating\* influenza infection and preventing mortality.*

- After vaccination:
  - Most adults develop antibody levels that are likely to protect them against virus strains included in the vaccine for that influenza season
  - They also may be protected against related variants
- Persons with impaired immunity may develop lower antibody levels post-vaccination.
  - Rather than preventing influenza infection in these individuals, vaccination may be more effective in preventing lower respiratory tract involvement or other complications of influenza

\*Attenuation = reducing the severity of disease

# When to administer influenza vaccine?

- Need to allow time for the full development of protective antibody levels (10-14 days).
- Vaccination is encouraged throughout the influenza season and in some settings such as pregnant women and residents of northern Australia, this should occur as soon as vaccine is available.
- The duration of protection for elderly people and residents of nursing homes is shorter, perhaps only three to six months, so it is important not to vaccinate them too early. While opportunistic vaccination is always important, dedicated clinics for elderly patients should occur in April.
- Some people will miss the pre-season window for vaccination. It is important to continue to offer vaccination throughout the influenza season.



# Influenza: how often to vaccinate?

## Annual vaccination is recommended

- The influenza virus is always changing.

Antibody levels decrease over the course of a year.

- For optimal protection against influenza and potentially, its complications – **yearly vaccination is recommended.**
- Annual vaccination is advised even if a person has been vaccinated previously and the new season influenza vaccine contains the same influenza strains as in the previous season's vaccine.

# Influenza vaccine: adverse events and contraindications

## Adverse events

Very common (> 10%)	Local reactions (swelling, induration, redness and pain)
Common (1-10%)	Mild, short-lived fever, malaise and myalgia
Rare	Immediate reactions, e.g. hives, angioedema, or anaphylaxis

## Contraindications

- Anaphylaxis following a previous dose of any influenza vaccine.
- Anaphylaxis following any vaccine component.

Note: It is now considered that persons with egg allergy, including anaphylaxis, can be safely vaccinated with influenza vaccines that have less than 1µg of residual egg ovalbumin per dose.

# AIVC Recommendations for composition of 2020 Influenza Vaccine for Australia

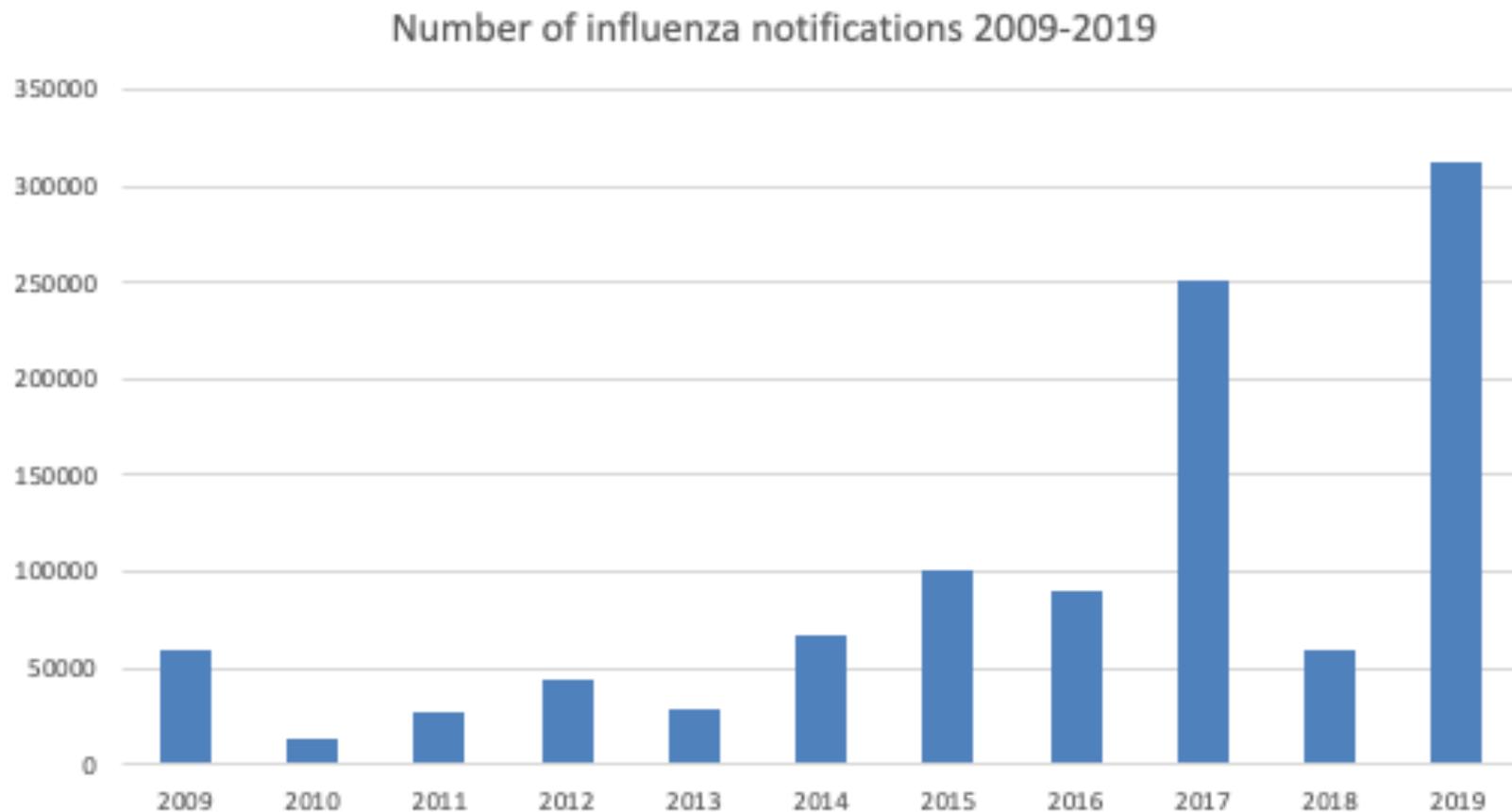
In 2020, vaccine composition:

The quadrivalent influenza vaccine components for the Australian 2019 influenza season should contain the following:

- **A (H1N1):** an A/Brisbane/02/2018 (H1N1) - like virus
- **A (H3N2):** an A/South Australia/34/2019 (H3N2) - like virus
- **B:** a B/Washington/02/2019 -like virus (B/Victoria/2/87 lineage)
- **B:** a B/Phuket/3073/2013 - like virus (B/Yamagata/16/88 lineage)

There will be no trivalent vaccines 2020

# Number of Influenza notifications (laboratory confirmed) from 2009 to 2019



# Number of Influenza notifications (laboratory confirmed) 2020 Australia



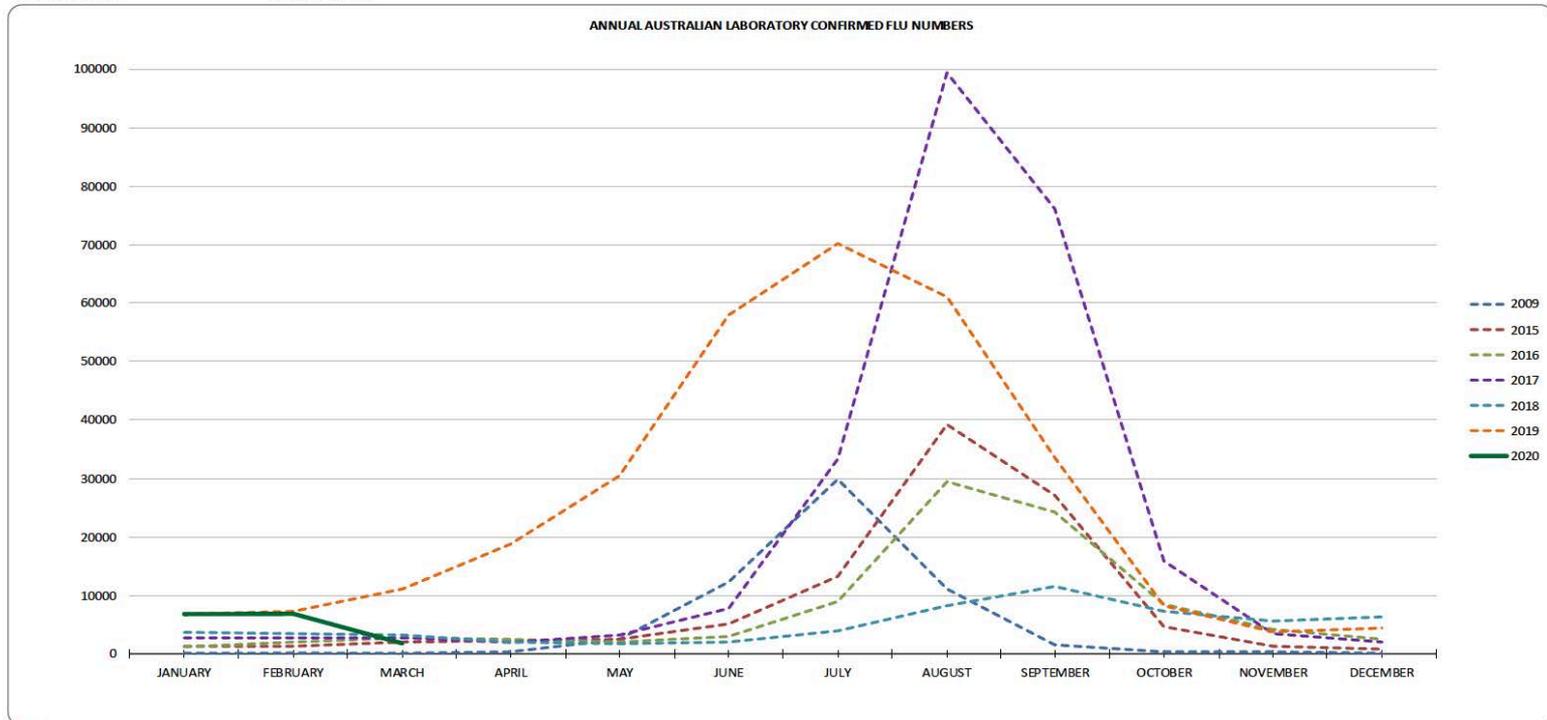
The Immunisation Coalition is the leading voice in whole-of-life immunisation in Australia, protecting all Australians against communicable diseases.

website: <http://www.immunisationcoalition.org.au/news-media/2019-influenza-statistics/>

## ANNUAL AUSTRALIAN INFLUENZA STATISTICS

YEAR	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	TOTALS
2009	182	125	164	275	2557	12318	29840	11119	1627	407	255	171	59040
2015	1249	1339	1967	2217	2529	5021	13282	39198	27080	4734	1179	788	100583
2016	1169	1970	2664	2433	2064	2837	9042	29426	24217	8465	4040	2557	90884
2017	2762	2750	2815	1939	3285	7793	33207	99367	76060	15912	3369	2031	251290
2018	3746	3481	3174	1977	1717	1988	3969	8168	11506	7320	5548	6267	58861
2019	6829	7161	11158	18667	30372	57842	70151	60964	33572	8319	3734	4316	313085
2020	6715	6825	1784										15324

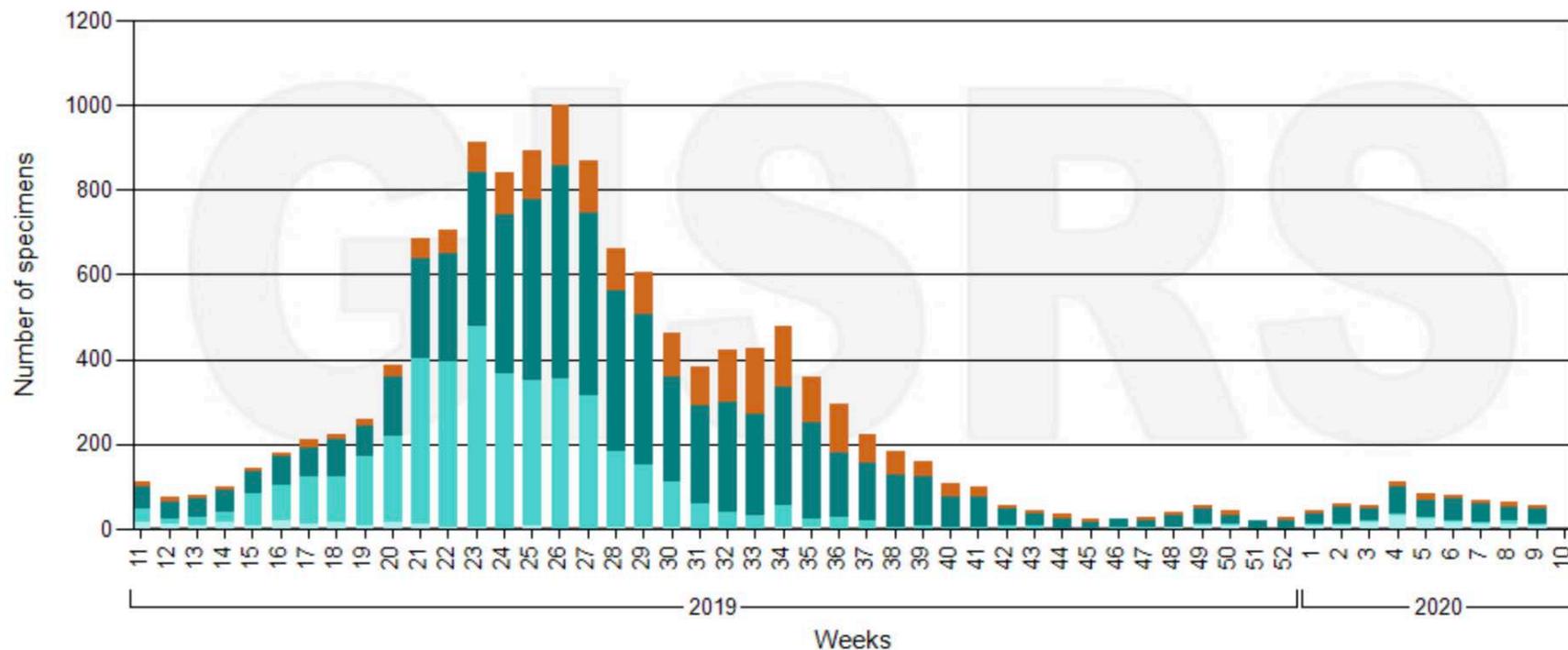
LAST UPDATED: 12 March 2020



# Notifications of laboratory confirmed influenza, Australia, April 2019 to March 2020, by subtype.

## Australia

Number of specimens positive for influenza by subtype



Data from: All sites

# Influenza Quadrivalent Vaccine Age Recommendations 2020

Vaccine	<u>FluQuadri</u> 0.50 mL (Sanofi)	<u>Vaxigrip</u> <b>Tetra</b> 0.50 mL (Sanofi)	<u>Flurix</u> <b>Tetra</b> 0.50 mL (GSK)	Afluria <b>Quad</b> 0.50 mL (Seqirus)	★ <u>Influvac</u> <b>Tetra</b> 0.50 mL (Mylan)	<u>Fluad</u> <b>Quad</b> 0.50 mL (Seqirus)
Registered Age group						
6 to 35 months (<3 years)	✓	✓	✓	<b>X</b>	<b>X</b>	<b>X</b>
≥3 to <5 years	✓	✓	✓	<b>X</b>	✓	<b>X</b>
≥5 to <65 years	✓	✓	✓	✓	✓	<b>X</b>
≥65 years	✓	✓	✓	✓	✓	✓†



Private market only



Adjuvanted QIV preferred over standard QIVs



# Vaccination coverage

	Seasonal influenza immunisation coverage
65 years and over	75%
≥18 to 64 years	23%

Reporting all adult vaccinations, including influenza vaccinations to the AIR will give us a better understanding of vaccine uptake.

# COVID-19 and influenza

- Symptoms are similar
- At risk groups are also similar
- Most other people experience mild disease
- There is presently no vaccine for COVID-19
- Vaccination against influenza will not protect from COVID-19
- It is more important than ever to be vaccinated against influenza
- If infection by influenza is followed by infection from COVID-19, it could have devastating effects
- And vice versa

# The practice nurse as an advocate for adult immunisation

- Accessible by patients.
- Trusted and credible.
- Ability to help educate and provide additional information:
  - Identify misconceptions e.g. “can get flu from the flu vaccine”
  - Address concerns
- General practice is at the forefront of healthcare in Australia and in a pivotal position to deliver preventive healthcare.

# Conclusions

- Many people are at increased risk of severe influenza or influenza-related complications because of their underlying medical conditions such as diabetes, heart disease, or lung disease even where these are controlled by medication.
- In an effort to prevent the disease burden of influenza in at-risk individuals, Australian guidelines recommend **yearly influenza vaccination**
- Funding for the vaccines in certain at-risk groups is available through the NIP (National Immunisation Program)
- Only QIV vaccines available in 2020
- Free flu vaccines for children under 5 now on the NIP
- At-risk individuals should be encouraged to speak to their doctor about their influenza vaccination status.
- Vaccination of those in close contact with at-risk individuals can provide them with an additional level of protection.





## Other take home messages:

- Offer influenza vaccine to every individual aged  $\geq 6$  months of age
- Undertake robust pre-vaccination checklist to identify 'at risk' individuals

Thank you for attending this webinar