KEY POINTS
1. Children under 5 years of age are at increased risk of severe influenza infections and death.
2. Influenza vaccination of young children has been shown to be safe and effective.
3. Influenza vaccination of young children not only protects this vulnerable age-group but is also an important way to reduce influenza transmission to other vulnerable groups.

Background
The National Health and Medical Research Council recommends annual vaccination for individuals 6 months or older who wish to reduce their chances of becoming ill with influenza.

Infants and children younger than 5 years of age are at high risk of getting severe influenza infections that require hospitalisation. Around 10% of hospitalised infants and children need care in an intensive care unit, and some, even previously healthy children, will die.

The NSW Government provides free influenza vaccination for all children aged 6 months to under 5 years for the 2018 influenza season. Children aged over 5 years who have high risk medical conditions are also eligible for vaccination under the National Immunisation Program.

Burden of illness
In Australia, more children aged under 5 are hospitalised with influenza than any other vaccine preventable disease.

The annual hospitalisation rate attributable to influenza for children aged under 5 is 105 per 100,000 children. This increases to 192 per 100,000 for children aged 0-5 months.

While children with underlying health problems are at higher risk, healthy children are also at risk. One study found 57% of Australian children admitted to hospital with influenza were otherwise healthy.

An Australian review of the 2015 influenza season at two major hospitals found 7.3% of children admitted with confirmed influenza needed intensive care. Only 12% of the children had received a seasonal influenza vaccine.

A 6-year study of influenza in the US found the highest incidence of influenza-related deaths were in children aged under 6 months and those aged 6-23 months (0.66 and 0.33 per 100,000 children respectively). In the 2010-2011 season nearly half of the children who died were otherwise healthy.

Effectiveness
Protection of children
International studies have documented the effectiveness of immunising healthy young children against influenza. One European study in 2008 found a 66% vaccine efficacy (VE) against confirmed influenza for children aged 9 months to 3 years, while a Japanese study of children aged 6 months to 6 years found VE against influenza A ranged from 42% to 69%.
depending on the vaccine match, and estimated one influenza A hospitalisation was prevented for each 71 children vaccinated\textsuperscript{12}.

Recent NSW and Australian studies have also demonstrated relatively high vaccine effectiveness among previously healthy children\textsuperscript{13}, particularly for children aged under 2 years\textsuperscript{14}, and also among children at risk of severe disease\textsuperscript{15}.

**Indirect protection**

One indirect way to protect vulnerable people, such as infants less than 6 months of age, those with compromised immune systems and older adults, is to increase influenza vaccination coverage in children.

Influenza vaccination programs for children have been shown to significantly reduce influenza-related disease and death in older adults as well as reduce rates of influenza-like illness in children\textsuperscript{16, 17, 18}.

There is consistent evidence of influenza vaccination in children providing indirect protection of unvaccinated persons at the household and population level, from both randomised trials and ecological studies\textsuperscript{19}.

**Safety**

Fever and injection site reactions are expected mild adverse reactions following immunisation. The current vaccine safety surveillance program which links provider and parent vaccine adverse event reporting with jurisdictional health departments and the Therapeutic Goods Administration, and active surveillance by AusVaxSafety at the National Centre for Immunisation Research and Surveillance, provides reassurance that the influenza vaccines used in children continue to be safe\textsuperscript{20, 21, 22}.

Febrile seizures after influenza vaccination can occur although this is uncommon, occurring at a rate of 1 or less per 1,000 vaccinated children up to 6 years of age\textsuperscript{23}. Parents should be made aware of the possibility and the child should be monitored for fever. Paracetamol or tepid water sponging can be used to reduce fever.

The safety of influenza vaccine in children – both those with and without high-risk medical conditions – will continue to be closely monitored.

**Influenza vaccine and febrile seizures in children in WA**

The 2010 Southern Hemisphere formulation of the trivalent influenza vaccine Fluvax\textsuperscript{®} (CSL) was associated with an increase in the rate of febrile seizures and this was particularly notable in Western Australia due to their universal influenza vaccination program for children\textsuperscript{24}. This problem was limited to a single brand’s manufacturing processes.

In 2018, Seqirus, the manufacturer of the current version of this product, Afluria\textsuperscript{®} Quad (now a quadrivalent vaccine) advises that it is only for use in adults aged 18 years and over\textsuperscript{25}.

**Influenza immunisation for children**

Influenza vaccines recommended for use in children in Australia are:

- FluQuadri Junior\textsuperscript{®} for children 6 months to less than 3 years; and
- FluQuadri\textsuperscript{®} and Fluarix Tetra\textsuperscript{®} for children 3 years of age and over.

Note that no influenza vaccines are licenced for use in children less than 6 months of age however, vaccination during pregnancy provides protection to infants in the early months of life\textsuperscript{26}.

**First year of receiving the influenza vaccine**

Children aged 6 months to under 9 years receiving influenza vaccine for the first time require 2 doses of an age-appropriate vaccine one month apart to maximise the immune response to the vaccine strains.

**Subsequent years**

Children who have previously received 1 or more doses of a trivalent or quadrivalent influenza vaccine require only 1 dose of an age-appropriate influenza vaccine for all seasons thereafter.

Vaccine providers should ensure that all influenza vaccinations administered to children are recorded in the Australian Immunisation Register (AIR) under the specific brand name used.
Influenza vaccines for children in NSW in 2018

6 MONTHS TO LESS THAN 3 YEARS OF AGE

FluQuadi™ Junior
- All children aged 6 to 35 months (including Aboriginal children and those with medical risk factors)
- Give two doses one month apart if first year of receiving flu vaccine
- Does NOT contain latex

3 YEARS TO 17 YEARS

FluQuadi™ OR Fluarix Tetra®
- All children 3 years to less than 5 years
- Children 36 months of age to 17 years with medical risk factors predisposing to severe influenza
- All Aboriginal children 36 months to 5 years of age & 15 years to 17 years
- Give two doses one month apart for children aged 3 to less than 9 years if first year of receiving flu vaccine
- Do not give a half dose
- Do not use for children less than 3 years of age
- Does NOT contain latex in the presentation available in Australia

References