

Influenza.
Don't get it.
Don't give it.

Everything you
need to know about

FLU

2017



The Immunisation
Advisory Centre



MINISTRY OF
HEALTH

MANATŪ HAUORA

CONTENTS

Key reference material

Key messages	2
Influenza the disease	3
NZ immunisation strategy	4
Eligibility for funded seasonal vaccine	4
Eligible medical conditions for funded influenza vaccine	5
Should healthcare workers be vaccinated?	6
Recording influenza vaccinations on the NIR	7
2017 Seasonal influenza vaccine order form	8
Ordering, delivery and storage	9
Patient consent form	10
Useful contact information	11

Clinical information

2017 seasonal influenza vaccine	12
2017 funded influenza vaccine summary table	14
Effectiveness of inactivated influenza vaccines	15
Safety of influenza vaccines	17

Influenza in specific patient groups

Influenza and children	19
Influenza and other special patient groups	20
Help protect our mums-to-be and newborns	21
The impact of influenza infection during pregnancy	22
Immunise to protect pregnant women and their babies	23
Questions and answers for pregnant women	24

The list of references is available in a separate document in the Resources section of the www.influenza.org.nz website

Introduction

The Ministry of Health and the Immunisation Advisory Centre appreciate all your hard work, and thank you for your role in ensuring New Zealanders are protected from influenza

This resource can be used by healthcare professionals supporting and/or providing influenza vaccinations in a variety of settings.

2017 key messages for use by health professionals:

- Around one in four New Zealanders are infected with influenza or 'flu' each year. Many won't feel sick at all, but can still pass it on to others. Getting an influenza vaccination before winter offers you and others the best protection
- Pregnant women and their babies can suffer serious consequences as a result of influenza. A FREE influenza vaccination during any trimester of the pregnancy reduces this risk
- Older people and those with certain medical conditions are more likely to have medical complications from influenza. A FREE influenza vaccination reduces these risks
- Influenza is a serious illness that can put anyone in hospital or even kill them, including young and healthy people
- Influenza vaccination is safe, effective and cannot give you "the flu"

The influenza immunisation programme goals are to:

- Achieve the target of 75% of the population aged 65 years and over are immunised against influenza annually
- Improve immunisation coverage for individuals under 65 years of age with certain medical conditions, and pregnant women
- Improve healthcare worker influenza immunisation coverage
- Achieve 1.2 million doses distributed annually immunisation coverage

Influenza vaccine availability

The funded influenza vaccine will be available from early March for those who meet PHARMAC's eligibility criteria i.e. pregnant women, those 65 years and over and those under 65 with certain medical conditions. The vaccine will be available until 31 December.

The key message is for people to get vaccinated before winter. Note that those at greatest risk from influenza will continue to have access to the funded influenza vaccine until the end of December if they have a change in their circumstances and/or they were not vaccinated earlier in the year.

Ordering influenza vaccine

Online ordering is available at www.hcl.co.nz. The online order process is less susceptible to error, has an audit trail and is faster. The Fax order form is available on page 8.

Recording influenza immunisation on the National Immunisation Register (NIR)

Ideally all influenza vaccinations are recorded on the NIR. This provides invaluable information for the planning of the programme to protect our population. For more information please refer to the section on 'Recording influenza vaccinations on the NIR' on page 7.

From 2017, the NIR web browser called Immunise Now will be used by pharmacist vaccinators to record influenza vaccinations on the NIR. If a general practice has previously recorded their patient's influenza vaccination on the NIR and this patient is then vaccinated by a pharmacist, the general practice will get an electronic notification that this vaccination has occurred. Pharmacist vaccinators are still required to inform an individual's GP when they have administered an influenza vaccine. It is planned for this process to be fully automated in the future.

An influenza coverage report is available for providers including general practice with access to the Business Objects NIR Datamart. The report provides information by DHB, PHO, Ethnicity and Deprivation.

Pharmacist vaccinators

From 2017, some pharmacist vaccinators will also be providing funded influenza vaccine to:

- Individuals aged 65 years and older
- Pregnant women

Go to influenza.org.nz for additional associated content

- Related diseases (pneumococcal, meningococcal and pertussis)
- Flu Kit References
- Claiming funded vaccine
- Use of antivirals for influenza treatment and/or prevention
- INFLUVAC® Data Sheet

Key messages

Your regular use and support of the following messages will play an essential role in increasing influenza immunisation and lowering infection rates.

- 1. Around one in four New Zealanders are infected with influenza or 'flu' each year. Many won't feel sick at all, but can still pass it on to others. Getting an influenza vaccination before winter offers you and others the best protection.**

Infected people have minor symptoms or no symptoms. But they can still pass their 'flu' onto other people, and some of these people will get very ill and may be hospitalised. Contact with the influenza virus is almost unavoidable, and while it does not always mean you'll be infected, it does mean the risk is never far away.

It is important you do what you can to prevent the virus being passed on to those who are more likely to get very sick from influenza – including young infants, pregnant women, the elderly and people with certain medical conditions such as asthma or heart problems.

- 2. Pregnant women and their babies can suffer serious consequences as a result of influenza. A FREE influenza vaccination during any trimester of the pregnancy reduces this risk.**

Unvaccinated pregnant women are at a higher risk from influenza, even when they are fit and well. Influenza during pregnancy increases the risks of premature birth, low birth weight, miscarriage, stillbirth or birth defects. The influenza vaccine is available from early March until 31 December.

- 3. Older people and people with certain medical conditions are more likely to have medical complications from influenza. A FREE influenza vaccination reduces these risks.**

Influenza can lead to serious complications, particularly in people 65 years and over, and those with certain medical conditions such as heart or lung conditions. Complications of influenza include pneumonia, heart failure, and worsening asthma. The influenza vaccine is available from early March until 31 December.

- 4. Influenza is a serious illness that can put anyone in hospital or even kill them, including young and healthy people.**

Influenza can make healthy adults, children and infants seriously ill or cause death. Influenza is more than just a 'bad cold'. Although some of the symptoms are the same as a bad cold, influenza is usually much more severe and lasts for longer. Symptoms of influenza include fever, sore throat, muscle aches, headache, cough and severe fatigue. A healthy diet and regular exercise may help support your immune system but will not protect you from influenza.

- 5. Influenza vaccination is safe, effective and cannot give you the 'flu'.**

It has an excellent safety record and has been proven to provide effective protection for most vaccinated people, including pregnant women and their unborn or newborn babies. There are no live viruses in the influenza vaccine.

Influenza the disease

Influenza is caused by different strains of influenza viruses. Symptoms may vary with age, immune status and health of the individual, and include fever, sore throat, muscle aches, headache, cough and severe fatigue. The fever and body aches can last 3–5 days and the cough and fatigue may last for two or more weeks.¹

Not everyone with influenza has symptoms or feels unwell. However, asymptomatic individuals can still transmit the virus to others.¹ Following the 2009 New Zealand influenza season almost one quarter of adults who reported that they had not had influenza in 2009 had serological evidence of prior infection (21% [95% CI 13–30%]).²

Influenza can be difficult to diagnose based on clinical symptoms alone because influenza symptoms can be similar to those caused by other infectious agents including *Neisseria meningitidis, respiratory syncytial virus (RSV), rhinovirus, and parainfluenza viruses.¹**

* For more information go to www.influenza.org.nz/meningococcal-disease

Almost one quarter of adults who reported having had influenza during 2009 had no serological evidence of prior infection (23% [95% CI 12%–35%]).²

During seasonal increases most influenza diagnoses are based on symptoms. The definitive diagnosis of influenza can only be made in the laboratory, usually from PCR testing of secretions from a nasopharyngeal swab. Samples should be collected within the first four days of illness.¹

The Southern Hemisphere Influenza and Vaccine Effectiveness Research and Surveillance (SHIVERS) study, based in Auckland, identified around one in four people were infected with influenza during the 2015 influenza season. Preliminary data suggests that 80% of children and adults with influenza did not have symptoms.³ Asymptomatic but infectious influenza cases can increase the spread of disease in the community and healthcare institutions.¹

The SHIVERS hospital-based surveillance for severe acute respiratory infections in Auckland during 2015 identified that infants aged less than 1 year had the highest severe acute influenza respiratory infection hospitalisation rates than all other age groups, 289 cases per 100,000 people compared with 20/100,000 for midlife adults and 141/100,000 for adults aged 80 years or older.⁴

Pacific peoples (115/100,000) had higher hospitalisation rates for severe acute influenza respiratory infection than Maori (51/100,000), and both groups had significantly higher hospitalisation rates than Asian, European and Other ethnicities. Individuals living in an area identified as having the highest deprivation levels, NZDep9–10, were over represented with hospitalisation rates at 72/100,000 people compared with 18–33/100,000 people across the other four quintiles.⁴

Transmission

The influenza virus is transmitted among people by direct contact, touching contaminated objects or by the inhalation of aerosols containing the virus, therefore thorough handwashing is an important preventative method. Symptomatic and asymptomatic influenza cases can transmit the virus and infect others. Healthy adults with influenza are infectious for up to five days, and children for up to two weeks. Extended periods in an enclosed, poorly ventilated space with an infected person increases the chances of acquiring infection.¹

Handwashing is an important and effective way of reducing the spread of influenza.

New Zealand immunisation strategy

Who should be vaccinated?

Influenza continues to be a major threat to public health worldwide because of its ability to spread rapidly through populations. Anyone aged 6 months or older can be vaccinated against influenza.

The influenza vaccination is funded for certain groups of people who are considered to be at greater risk of complications from influenza. The vaccination

is recommended (although not funded), to reduce the risk of spread of the disease, for those who are in close contact with individuals at high risk of complications.

Eligibility for funded seasonal vaccine

INFLUVAC® is funded if administered to eligible people by 31 December 2017. Influenza vaccination before winter offers the best protection.

Note: INFLUVAC® is a Prescription Medicine. For full prescribing information please refer to the data sheets at www.medsafe.govt.nz or www.influenza.org.nz

Eligibility criteria for FREE seasonal influenza vaccination for 2017:

- 1. Pregnant women (any trimester)**
- 2. Anyone under 65 years with any of the medical conditions listed on opposite page**
- 3. Anyone aged 65 years or over**

The following conditions are excluded from funding:

- Asthma not requiring regular preventative therapy
- Hypertension and/or dyslipidaemia without evidence of end-organ disease

Patient eligibility and clinical queries contact:

Immunisation Advisory Centre (IMAC)
The University of Auckland

Phone: **0800 IMMUNE (0800 466 863)**

Email: **0800immune@auckland.ac.nz**

Also refer to the New Zealand Pharmaceutical Schedule on the PHARMAC website (www.pharmac.govt.nz/patients/PharmaceuticalSchedule)

Eligible medical conditions for funded influenza vaccine

List of eligible medical conditions for funded influenza immunisation (adults and children).
For eligibility queries call 0800 IMMUNE (0800 466 863).

Funded influenza vaccine is available each year for patients who meet the following criteria as set by PHARMAC:

- all people 65 years of age and over; or
- people under 65 years of age who:
 - have any of the following cardiovascular diseases:
 - ischaemic heart disease, or
 - congestive heart failure, or
 - rheumatic heart disease, or
 - congenital heart disease, or
 - cerebrovascular disease; or
 - have either of the following chronic respiratory diseases:
 - asthma, if on a regular preventative therapy, or
 - other chronic respiratory disease with impaired lung function;^a or
 - have diabetes; or
 - have chronic renal disease; or
 - have any cancer, excluding basal and squamous skin cancers if not invasive; or

- have any of the following other conditions:
 - autoimmune disease^b, or
 - immune suppression or immune deficiency, or
 - HIV, or
 - transplant recipients, or
 - neuromuscular and CNS diseases/disorders^c, or
 - haemoglobinopathies^d, or
 - are children on long term aspirin, or
 - have a cochlear implant, or
 - errors of metabolism at risk of major metabolic decompensation, or
 - pre and post splenectomy, or
 - down syndrome, or
- are pregnant (any trimester); or
- children aged four years and under who have been hospitalised for respiratory illness or have a history of significant respiratory illness;

Unless meeting the criteria set out above, the following conditions are excluded from funding:

- asthma not requiring regular preventative therapy,
- hypertension and/or dyslipidaemia without evidence of end-organ disease.

a Chronic respiratory diseases may include: chronic bronchitis, chronic obstructive pulmonary disease, cystic fibrosis, emphysema.

b Autoimmune diseases may include: coeliac disease, Crohns disease, Graves' disease, Hashimoto's thyroiditis, lupus, rheumatoid arthritis: Immune suppression or immune deficiency includes diseases modifying anti-rheumatic drugs (DMARDs) or targeted biologic therapies.

c Neuromuscular and CNS diseases/disorders include: cerebral palsy, congenital myopathy, epilepsy, hydrocephaly, motor neurone disease, multiple sclerosis, muscular dystrophy, myasthenia gravis, Parkinson's disease.

d Haemoglobinopathies including: sickle cell anaemia, thalassemia.

Should healthcare workers be vaccinated?

Yes. The World Health Organization strongly recommends healthcare workers as a priority group for influenza vaccination, not only for their own protection and ability to maintain services but also to reduce the spread of influenza to their vulnerable patients including pregnant women.⁵

Healthcare workers can transmit influenza without knowing they are infected. Influenza does not always cause symptoms or make a person feel unwell. Following the 2009 influenza season in New Zealand, almost one quarter of the adults who reported that they had not had influenza in 2009 had serological evidence of prior infection (21% [95% CI 13–30%]).² More recently, preliminary data from the Southern Hemisphere Influenza and Vaccine Effectiveness Research and Surveillance (SHIVERS) study, based in Auckland, suggests that 80% of children and adults with influenza did not have symptoms.³

Healthcare workers have an **ethical responsibility** to protect vulnerable patients from the serious health threat of influenza illness. Studies demonstrate that annual influenza vaccination for healthcare workers is likely to reduce illness among the patients they care for.^{6–8} Relying on patients being vaccinated is not enough as vulnerable people may have a poor immune response to their vaccination or may not have been vaccinated this year.

District health board healthcare workers influenza vaccination coverage rates for district health board-based healthcare workers steadily improved from 45% in 2010 to 65% in 2016.⁹ The 2016 Workforce influenza Immunisation Coverage Rates by District Health Boards report is available on the Ministry of Health website www.health.govt.nz/our-work/diseases-and-conditions/influenza.

When should people be vaccinated?

The best time to be vaccinated is prior to influenza entering the community, before the start of the winter season. However, influenza vaccinations can be given when influenza virus activity has been identified as protective antibody levels

have been observed to develop rapidly from four days after vaccination.^{10,11} The funded vaccination will be available for 65 years and older, pregnant women and under 65 years old with certain medical conditions from early March until 31 December.

Why influenza vaccination is needed every year?

Annual influenza vaccination is required for two important reasons:

- Protection lessens over time
- The circulating influenza strains change each year and may not have been included in the previous year's vaccine

For 2017, of the three influenza strains included in the vaccine, one is new (in bold):¹²

- **A/Michigan/45/2015 (H1N1)pdm09-like virus**
- A/Hong Kong/4801/2014 (H3N2)-like virus
- B/Brisbane/60/2008-like virus

Recording influenza vaccinations on the National Immunisation Register

The National Immunisation Register (NIR) is a national database, held by the Ministry of Health. The NIR records immunisations given to New Zealand children and for other National Immunisation Schedule vaccines, including for influenza and pregnant women. The Ministry uses the NIR to help assess the protection against influenza, monitor vaccine coverage and plan future population health programmes.

The following points are useful for informing your patients about the NIR

- The NIR provides an accurate record of a person's immunisation history, to help with their ongoing health care even if they change doctors, and to help the Ministry measure immunisation coverage across the whole population
- The NIR records a person's NHI, name, gender, address, date of birth, and immunisation information
- Only authorised professionals will see, use or change the information
- Information that does not identify individuals may be used for research or planning

The NIR resource leaflet (HE2423) informs adults about the NIR. Leaflet pads can be ordered from www.healthed.govt.nz.

An influenza coverage report is available for providers including general practice with access to the Business Objects NIR Datamart. The report provides information by district health board, Primary Health Organisation, Ethnicity and Deprivation.

Recording adult influenza vaccine on the NIR in:

General Practice

The NIR and Practice Management Systems (PMS) record the influenza vaccine information given in general practice for all age groups and for pregnant women. To record an adult's influenza vaccine information on the NIR select the opt-on button on your PMS.

To help avoid errors in recording influenza on the NIR:

- Ensure you have the most up to date PMS software version
- Send a list of all the vaccinators and GPs who will deliver the influenza vaccine in your practice to your local district health board NIR administrator before the beginning of the influenza season to ensure they are entered into the system

- Vaccinators should validate patients' addresses in all address fields before they are messaged to the NIR
- The provider should be noted as the "GP" and the nurse the "vaccinator"
- For adults wanting to opt off the recording of their influenza vaccination on the NIR please leave the opt-on/off fields blank. The immunisation information will only be recorded on your PMS and will not be sent to the NIR

Note: the NIR influenza programme does not schedule vaccinations as it does for the childhood vaccines.

Pharmacy

From 2017, the NIR web browser called Immunise Now will be used by pharmacist vaccinators to send influenza vaccine messages to the NIR.

Pharmacist vaccinators are still required to notify an individual's GP when they have administered an influenza vaccine to their patient so their records can be updated. It is planned for this process to be fully automated in the future.

Other influenza vaccination settings

The Ministry is working towards expanding access to 'Immunise Now' in the future for other influenza vaccination settings such as district health board clinics or workplaces.

Occupational health providers are also expected to notify an individual's general practice when they have administered an influenza vaccine so their records can be updated

For questions about:

- The NIR please contact your local district health board NIR administrator or contact the Ministry of Health Support team 0800 505 125 and select option 3
- Immunise Now contact the Ministry of Health Support Team (details above)
- Your general practice or pharmacy PMS, please contact your vendor directly.

2017 Seasonal influenza vaccine order form

(Failing to complete in full may delay the processing of your order)

TO: Healthcare Logistics

ONLINE – preferred option: www.hcl.co.nz (registration required) or

TOLL-FREE FAX: 0508 408 358

Date: _____ Healthcare Logistics Customer Number: _____

Surgery name: _____

Contact name: _____

Delivery address: _____

Contact phone: _____

Email address for invoice: _____

(Email address for invoicing only needs to be provided once)

Customer purchase order number (if applicable): _____

I would like to order:

☐

DOSES [1128082], Seasonal Influenza Vaccine (only available in multiples of 10).

You will be supplied the doses that you commit to in your online or faxed order (please remember we cannot split boxes).

Influenza chilly bins cannot be recycled. To reduce wastage when ordering, please consider your expected usage.

A small bin holds 60 doses, a medium chilly bin holds up to 120 doses, a large bin holds up to 180 doses, the extra-large bin holds up to 500 doses.

Depending on your fridge capacity, please try to order every two weeks (the same ordering pattern as you order for funded-schedule vaccines).

Note: Due to demand, please allow up to 48 hours before dispatch. Please do not book your clinics before the stock has arrived.

Minimum order quantities apply as follows:

MARCH	APRIL	MAY	JUNE	JULY	AUG-DEC
Min 60 doses	Min 60 doses	Min 60 doses	Min 30 doses	Min 20 doses	Min 10 doses

NOTE: Some orders may have a temperature logging device included with the shipment. Do not be concerned if your shipment does not contain a temperature logging device.

Note to providers: Consider combining your influenza vaccine order with your non-funded vaccines order as part of a consolidated order.

Refund for unused stock

One refund per season will be available for a total of 10 doses of unused stock of seasonal influenza vaccine INFLUVAC® from any one account. Unused stock can be returned from 1 September 2017. Please ensure you continue to have influenza vaccine stock available until 31 December for those who are eligible for influenza vaccination.

Thereafter surgeries should contact their immunisation coordinator for information on safe disposal.

For any further information on ordering, please phone Healthcare Logistics Customer Services **0508 425 358**.

This form is also available on www.influenza.org.nz in the Resource section.



Key reference material

Ordering, delivery and storage

Seasonal influenza vaccine ordering is handled by Healthcare Logistics (HCL). You can order in two ways:

ONLINE – preferred option: www.hconline.co.nz (registration required) or TOLL FREE Fax: 0508 408 358

Enquiries can be made by calling: **0508 425 358**. Order form is also available on www.influenza.org.nz in Resource section.

Cost of the influenza vaccine

The vaccine costs \$9.00 (excl. GST) per dose. For patients eligible for funded influenza vaccine (refer to page 5), the vaccine is free (i.e. no vaccine cost and no administration service cost to the patient). General practices can claim for the cost of the vaccine and the immunisation benefit for administration of a funded influenza vaccine to an eligible individual via the usual Sector Services process.

Note: Claims can only be made when the vaccine is given during the funded seasonal influenza immunisation programme, usually early March to 31 December.

Influenza vaccine is still available following the funded period, however, all patients will have to pay for it.

How much is the immunisation benefit?

\$20.14 (excl. GST)

Delivery charges?

There are no delivery charges.

Minimum order requirements?

The following minimum order quantities apply:

MARCH	Min 60 doses	JUNE	Min 30 doses
APRIL	Min 60 doses	JULY	Min 20 doses
MAY	Min 30 doses	AUG-DEC	Min 10 doses

Note to providers: Consider combining your influenza vaccine order with your non-funded vaccines order as part of a consolidated order.

Influenza vaccine chilly bins

Influenza vaccine chilly bins **cannot** be recycled. To reduce wastage when ordering, please consider your expected usage. A small bin holds 60 doses, a medium chilly bin holds up to 120 doses, a large bin holds up to 180 doses, the extra-large bin holds up to 500 doses. Depending on your fridge capacity, please try to order every two weeks (the same ordering pattern as you order for funded, schedule vaccines).

Vaccine availability at the start of the season

Orders will be dispatched as soon as the vaccine is released by Ministry of Health. **Please do not organise clinics before vaccine stock has arrived.**

Influenza vaccine stock damaged in transit

Influenza vaccine damaged in transit may be returned to Healthcare Logistics for destruction. Please contact Healthcare Logistics 0508 425 358 before returning.

Refund for unused stock/expired influenza vaccine

- A refund will be available for a total of 10 doses of unused stock of seasonal influenza vaccine for INFLUVAC® from any one account. Unused stock can be returned from 1 September 2017, please ensure you continue to have influenza vaccine stock available until 31 December for those who are eligible for influenza vaccination.
- If the vaccine was supplied to you by Healthcare Logistics directly, please contact 0508 425 358 to request a Return Authorisation.
- After that date, clinics/practices should contact their immunisation coordinator for information on safe disposal.

The shelf life of INFLUVAC®

Twelve months from date of manufacture, if stored between +2°C and +8°C at all times. All pre-filled syringes are marked with an expiry date which should be checked before vaccine administration.

Cold Chain

The vaccine must be stored between +2°C and +8°C at all times. It must not be frozen. If the vaccine has been stored outside the +2°C to +8°C temperature range at any time (e.g. inadvertently left out of the refrigerator or has been frozen), please contact your local immunisation coordinator for advice and refer to the National Standards for Vaccine Storage and Transportation for Immunisation Providers 2017. See www.health.govt.nz/coldchain.

Temperature logging devices

A temperature logging device may be included with your order. Details about the device will also be included with your order.

Patient consent form

Patient/Guardian

Surname: _____ First name: _____

Phone: _____ Date of birth: _____ M F NHI: _____

Ethnicity: ☐ NZ European ☐ Māori ☐ Samoan ☐ Cook Island Māori ☐ Tongan ☐ Niuean ☐ Chinese
☐ Indian ☐ Other (such as Dutch, Japanese, Tokelauan) Please state: _____

Name of guardian (if applicable): _____

Address: _____

Your doctor's name / surgery address and postcode: _____

This form confirms that you have given your consent to have an influenza vaccination.

If any of the following apply to you then please advise your healthcare professional:

- ☐ I am currently unwell with a high fever ☐ I have had a previous severe response to an influenza vaccination
☐ I have a history of a bleeding disorder ☐ I have a severe allergy to eggs and / or any chicken products

Possible responses to influenza vaccination:

Influenza vaccination is usually well tolerated. Possible responses include redness, tenderness or hardness at the injection site for a day or two; a mild fever, muscle aches or headache within the first two days. Rarely, an allergic response can occur.

You should remain under observation to watch for an allergic response for 20 minutes after your vaccination.

The influenza vaccine does not protect against other respiratory viruses such as the common cold. For more information on the influenza vaccine please refer to the Consumer Medicine Information located at www.medsafe.govt.nz

The Ministry of Health keeps a record of influenza vaccination on the National Immunisation Register so that authorised health professionals can find out what vaccinations have been given. It helps to monitor the population's protection against influenza. If you do not want your vaccination recorded on the National Immunisation Register please advise your doctor, nurse or healthcare professional.

I have read or have had explained to me information about influenza vaccination, and I have had a chance to ask questions that were answered to my satisfaction. I believe I understand the benefits and risks of influenza vaccination. I understand getting the vaccination is my choice. I agree to get the vaccination and that it is recommended that I wait here for 20 minutes after my vaccination.

I consent to this information being given to my healthcare provider to update applicable records.

Signed: _____ Date: _____

Signed/Guardian (if applicable): _____

Relationship to the child/patient: _____

Vaccination record (for Clinic Use Only)

Vaccine: _____ Administered: Left / Right Arm

Vaccine Batch Number: _____ Vaccinator: _____

Expiry Date: _____

The influenza vaccine is a prescription medicine. Talk to your healthcare professional about the benefits and possible risks.

Useful contact information

Ordering resources – Visit influenza.org.nz/resources and choose your occupational group to see what resources are available

All the information and contacts you may need are here:

Ordering vaccine:

All influenza vaccine ordering is handled by Healthcare Logistics (HCL).

ONLINE – preferred option: www.hcl.co.nz (registration required)
or TOLL FREE Fax: 0508 408 358

For questions about ordering vaccine contact HCL, on their Customer Service line **0508 425 358**

Patient eligibility, clinical queries and general information:

Immunisation Advisory Centre (IMAC),
The University of Auckland

Phone: 0800 Immune (0800 466 863)
Email: 0800immune@auckland.ac.nz
Website: www.immune.org.nz

New Zealand Pharmaceutical Schedule on the
PHARMAC website

Website: www.pharmac.govt.nz/patients/PharmaceuticalSchedule

Information on claiming funded vaccine:

For vaccine claim queries contact Sector Services Help Desk on

Phone: 0800 458 448

For manual forms download the format: <http://www.health.govt.nz/new-zealand-health-system/claims-provider-payments-and-entitlements/immunisation-subsidy>

If you do not know your patient's NHI number contact Sector Services on

Phone: 0800 855 151

Information on the national influenza immunisation campaign:

Email: influenza@auckland.ac.nz

Phone: (09) 373 7599 ext. 82075

Website: www.influenza.org.nz

Your local immunisation coordinator may be able to assist with more information.

Centre for adverse reactions monitoring (CARM):

Health professionals can report any adverse reaction to influenza vaccination online at New Zealand Pharmacovigilance Centre's website: <https://nzphvc.otago.ac.nz> (use your practice number as login).

Phone: (03) 479 7247

Fax: (03) 479 7150

Email: nzphvc.otago.ac.nz

**Post: NZPhvC, University of Otago Medical School
PO Box 913, Dunedin 9054**

2017 seasonal influenza vaccine

What are the influenza vaccine strains for 2017?

This year's seasonal influenza vaccine will offer protection against the following strains:¹²

- A/Michigan/45/2015 (H1N1)pdm09-like virus
- A/Hong Kong/4801/2014 (H3N2)-like virus
- B/Brisbane/60/2008-like virus

What is the additional influenza vaccine strain in the 2017 quadrivalent vaccine?

B/Phuket/3073/2013-like virus.

What is the funded influenza vaccine for 2017?

INFLUVAC® (Mylan) is the funded vaccine for 2017. For more information on the vaccine, please refer to the vaccine data sheet (www.medsafe.govt.nz or www.influenza.org.nz) and Vaccine Summary Table on page 14 of this resource.¹³

Is INFLUVAC® a single dose vaccine?

Yes. When a half-dose (0.25mL) of vaccine is required for a child aged 6–35 months, the unused portion of vaccine must be discarded.

How is INFLUVAC® produced?

INFLUVAC® is a subunit vaccine that contains only viral surface antigens (haemagglutinin proteins). The vaccine is inactivated.

Influenza virus is grown in embryonated hens' eggs from disease-free flocks. The haemagglutinin protein for each strain is harvested and purified for use in the vaccine.

Does INFLUVAC® contain blood products?

No. Blood products are not used in the INFLUVAC® manufacturing process.¹³

Does INFLUVAC® contain gentamicin?

Yes. INFLUVAC® vaccine contains traces of gentamicin due to the use of this substance during production.¹³ INFLUVAC® should be used with caution in people with a hypersensitivity to gentamicin.

Is INFLUVAC® latex free?

INFLUVAC® syringes do not contain any latex components. However, the manufacturer (Mylan) is unable to confirm that the product did not come in contact with any latex materials during the manufacturing and packaging process. Patients highly sensitive to latex, who have a history of severe hypersensitivity response to this material, are advised that they should consult their doctor.

Do INFLUVAC® contain thiomersal?

No. INFLUVAC® is preservative free. The vaccine does not contain thiomersal.¹³

Can INFLUVAC® be administered simultaneously with other vaccines?

Yes. Influenza vaccine can be administered with other vaccines, such as Tdap, pneumococcal vaccines or the childhood National Immunisation Schedule vaccines. However, the vaccines must be given at different injection sites.

Children receiving influenza and 13-valent pneumococcal conjugate (PCV13) vaccines concurrently have an increased risk of post-

vaccination fever.^{14,15} Adults have an increased risk of fatigue, headache and body aches and pains when these vaccines are administered concurrently.¹⁶ Separating administration of these vaccines by two days can be offered, but is not essential.

Adults receiving influenza and 23PPV (PNEUMOVAX® 23) vaccines concurrently have an increased risk of redness at the site of one or both injections.¹⁷

Can INFLUVAC® be given to people with egg allergies?

In most cases the vaccine can be safely administered to people with a history of allergy to egg.^{18–20} An individual with an egg allergy that does not result in anaphylaxis can be vaccinated at general practices, pharmacies or the workplace.

If an individual has a high-risk of complications from influenza and has a history of anaphylaxis to eggs, it is important to seek specialist advice about influenza vaccination. The risk of anaphylaxis needs to be considered against the benefits of being protected from influenza or its complications. As the vaccine virus is grown in hens' eggs it may contain minute amounts of egg protein.

Can INFLUVAC® be given to people with a sulfonamide (sulfur) allergy?

Yes. Sulfonamide (sulfur) antibiotics, such as co-trimoxazole, sulfasalazine, and sulphite preservatives used in food are different to medicines containing the words sulfate or sulphate, e.g. gentamicin sulphate.²¹

Can you get influenza from INFLUVAC®?

No. The vaccine has been made from influenza viruses that have been concentrated, inactivated, and then broken apart. INFLUVAC® cannot cause influenza as the vaccine does not contain any live viruses.¹³

Sometimes influenza vaccination is accused of causing the disease. There are two possible reasons for this. Firstly when vaccinated, the body responds to vaccination by producing an immune response. This can include systemic symptoms such as fever, headache or fatigue, which may mistakenly be assumed to be early signs of influenza but are the body responding to the vaccination. Secondly, other respiratory viruses and bacteria circulate during the winter months and influenza vaccination does not protect against these.

Most of these other viruses cause milder infections. However, some viruses and bacteria may produce influenza-like symptoms and/or quite severe illness which can lead to the suggestion that influenza vaccination is ineffective. These illnesses should not be confused with influenza.

How effective is the vaccine against influenza strains not included in the formulation?

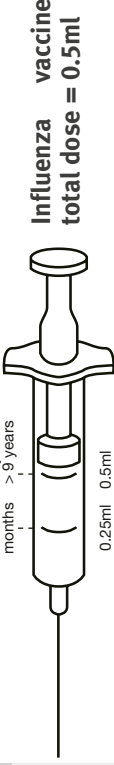
Effectiveness can be reduced by the difference between circulating virus strains and vaccine strains. The influenza virus keeps changing and new vaccines are formulated for each northern and southern hemisphere season. There may be some cross protection against an influenza virus not in the vaccine.^{22,23}

Pharmacist vaccinators

Some community pharmacies provide purchased influenza vaccination to individuals aged 13 years and older. In 2017, some community pharmacies will also be able to provide funded influenza vaccination to:

- those aged 65 years and over
- pregnant women

2017 funded influenza vaccine summary table

	INFLUVAC®												
Manufacturer:	Mylan												
Influenza strains for 2017:	• A/Michigan/45/2015 (H1N1)pdm09-like virus • A/Hong Kong/4801/2014 (H3N2)-like virus • B/Brisbane/60/2008-like virus												
Dosage:	<p>Where the recommendation differs from the manufacturer's datasheet, the latest Ministry of Health Immunisation Handbook takes preference:</p> <table><tr><th>Age</th><th>Dose</th><th>Number of doses</th></tr><tr><td>6-35 months</td><td>0.25mL</td><td>1 or 2*</td></tr><tr><td>3-8 years</td><td>0.5mL</td><td>1 or 2*</td></tr><tr><td>≥9 years</td><td>0.5mL</td><td>1</td></tr></table>  <p>*Two doses separated by at least four weeks if an influenza vaccine is being used for the first time. INFLUVAC® is a single dose vaccine.</p>	Age	Dose	Number of doses	6-35 months	0.25mL	1 or 2*	3-8 years	0.5mL	1 or 2*	≥9 years	0.5mL	1
Age	Dose	Number of doses											
6-35 months	0.25mL	1 or 2*											
3-8 years	0.5mL	1 or 2*											
≥9 years	0.5mL	1											
Route of administration:	Intramuscular or deep subcutaneous injection												
Latex:	INFLUVAC® syringes do not contain any latex components. However, the manufacturer (Mylan) is unable to confirm that the product did not come in contact with any latex materials during the manufacturing and packaging process. Patients highly sensitive to latex, who have a history of severe hypersensitivity response to this material, are advised that they should consult their doctor.												
Components of special note:	• Gentamicin												
Presentation:	Pre-filled syringe: 0.5mL												
Storage:	• Vaccines must be stored, protected from light, at +2°C to +8°C. DO NOT FREEZE. Contact your Immunisation Coordinator if the vaccine has been stored outside the required +2°C to +8°C range. For more information refer to the National Standards for Vaccine Storage and Transportation for Immunisation Providers 2017 available on the Ministry of Health website www.health.govt.nz/coldchain												
Phone regarding clinical information:	Mylan: 0800 737 271												
Funding status:	Fully funded for eligible groups												
Order from:	Healthcare Logistics (HCL) • Phone: 0508 425 358 • Fax: 0508 408 358 • www.hcl.co.nz												

INFLUVAC® is a prescription only medicine.

Please refer to manufacturers data sheet for further details

www.medsafe.govt.nz and www.influenza.org.nz

Effectiveness of inactivated influenza vaccines

How effective is the trivalent inactivated influenza vaccine?

The efficacy (prevention of illness among vaccinated persons in controlled trials) and effectiveness (prevention of illness in vaccinated populations) of influenza vaccines is dependent on several factors. The age, immune status and health of the recipient are important as well as the match between circulating viral strains and the vaccine. Randomised controlled trials comparing vaccinated with unvaccinated participants show that outcome measures that include laboratory-confirmed infection with influenza virus provide the most robust evidence of vaccine efficacy.

Inactivated seasonal influenza vaccine effectiveness against influenza in recent meta-analyses and systematic reviews ranges from 59% (95% CI 51–67)²² to 73% (54–84)²³ in healthy adults for years when circulating and vaccine strains are well matched. Vaccine effectiveness may not be as high in the elderly and those with high-risk conditions. A re-analysis of the Cochrane Review, *Vaccines for preventing influenza in the elderly*,²⁴ applying a biological perspective to the same information found that influenza vaccination of the elderly is often protective.²⁵

The following table summarises selected current estimates of both vaccine efficacy and vaccine effectiveness against a range of clinical outcomes.

Population	Type of Outcome	Level of protection (95% confidence intervals)
Infants less than 6 months whose mothers received an influenza vaccination during pregnancy	Efficacy against laboratory confirmed influenza	41%–48% ^{26,27}
Healthy children less than 2 years of age	Effectiveness against laboratory confirmed influenza	Insufficient data ^{22,28} 66% (9%–88%) ²⁶
Healthy children aged 6–35 months	Effectiveness against laboratory confirmed influenza	66% (29%–84%) ²⁹
Healthy children less than 16 years of age	Effectiveness against influenza requiring hospitalisation	56% (12–78%) ³⁰
Healthy adults (18–64 years)	Effectiveness against influenza-like illness requiring a GP visit or hospitalisation in NZ	30%–60% ^{4,31}
Pregnant women	Effectiveness against laboratory confirmed influenza	59% (51%–67%) ²²
	Effectiveness against acute respiratory illness requiring: an emergency department visit, or hospitalisation	81% (31%–95%) ³² 65% (3–87%) ³²
	Effectiveness in preventing influenza, influenza-like illness, hospitalisations, complications and mortality	Inconclusive due to poor quality of studies ²⁴

Population	Type of Outcome	Level of protection (95% confidence intervals)
Elderly aged 65 years and over (Re-analysis of Cochrane Review 2010 information ²⁵)	Effectiveness against non-fatal and fatal complications	28% (26% – 30%) ²⁰
	Effectiveness against influenza-like illness	49% (33%–62%) ²⁵
	Effectiveness against laboratory confirmed influenza	39% (35%–43%) ²²

Influenza vaccines are effective in children; however less evidence is available for children less than 2 years of age.^{22,28} In healthy adults, influenza vaccines are effective in reducing cases of influenza particularly when the vaccine and circulating virus strains are well matched.^{22,31} Evidence suggests the effectiveness of influenza vaccination in the community-dwelling elderly is modest. There is some evidence that in long-term care facilities, influenza vaccination is effective against complications.²⁴

New Zealand data from the SHIVERS study have shown that the influenza vaccine used during the 2014 influenza season was around 53% effective (95% confidence intervals, 28–70%) at preventing influenza-related presentations to general practice and 52% effective (27%–68%) preventing hospitalisations overall.³¹ In the 2015 season the influenza vaccine was around 36% effective (95% confidence interval, 11–54%) at preventing influenza-related presentations to general practice and 50% effective (20%–68%) preventing influenza-related hospitalisations overall.⁴

Is the vaccine useful in older people?

Although older people (65 years plus) may have a reduced immune response to influenza vaccine compared with younger adults, they may still benefit from influenza vaccination.²⁵ Older people are more likely to have a condition that places them at higher risk of complications from influenza.

Influenza vaccination is recommended (although not funded) for those who are in close contact with older people and individuals at high-risk of influenza infections to reduce the spread of disease to those who are more vulnerable and also may be less likely to mount a strong immune response to the vaccine.

How long after vaccination does it take for antibodies to be produced?

It takes up to two weeks for the vaccine to start providing protection. Some studies have observed protective levels of antibodies developing as early as four days after vaccination.^{10,11}

Why does a child need two doses if vaccinated for the first time?

Children less than 9 years of age have a better immune response after two doses for the first influenza vaccination. This may be because they are more likely to be immunologically naive to influenza.³³

Safety of influenza vaccines

Common responses to vaccination

Influenza vaccine is generally well tolerated.

Common responses associated with inactivated influenza vaccines in adults and children include pain and/or redness at the site of injection. Local responses are almost always mild. Systemic events such as headache and fatigue may occur in adults.^{34–36} Fever, irritability and loss of appetite are more likely to occur in children.^{34–37} These are generally mild and of short duration. Other systemic events such as muscle aches or cough may appear influenza-like. However, the influenza vaccine currently used in New Zealand does not contain live viruses and cannot cause the disease.^{34–36}

Serious events associated with influenza vaccine

The most significant serious adverse event associated with influenza vaccination is anaphylaxis, a serious allergic response that usually comes on within minutes of receiving the vaccine. This occurs around once in a million influenza vaccine doses.³⁸

With the possible exception of Guillain-Barré syndrome, other serious adverse events, such as onset of autoimmune conditions, are no more likely to occur in vaccinated persons compared with unvaccinated people.^{34–36}

Guillain-Barré Syndrome and influenza vaccine

Guillain-Barré syndrome (GBS) has an annual incidence of around 1–4 cases per 100,000 people worldwide.³⁹

During a swine influenza vaccination campaign in the United States in the 1970s, an increase in GBS was observed in vaccine recipients (around one case per 100,000 vaccinations) and the vaccination campaign was halted and surveillance of GBS expanded.⁴⁰

Epidemiological studies since then have suggested either no increased risk or a possible slight increase in risk of around one case per million adult influenza

vaccinations. A recent meta-analysis of these studies identified a small increase in the risk of GBS following influenza vaccination.⁴¹ However, studies have also identified that the risk of GBS following an episode of influenza-like illness is significantly higher than the risk following influenza vaccination, especially in older adults.^{42,43} This highlights the importance of balancing the potential risks of disease with the potential risks and benefits of influenza vaccination to make an informed decision.⁴⁴

Febrile adverse events

Fever is a common adverse event in children after vaccination. Convulsions associated with fever can occur in susceptible children. Around 3–8 children in 100 aged less than 7 years will experience a febrile convulsion, most likely when aged between 16 and 30 months.⁴⁵

Studies identified an increased risk of fever 38°C or over in children aged 6–23 months when an influenza and 13-valent pneumococcal conjugate vaccine PCV13 (PREVENAR 13®) vaccines were administered concurrently.^{17,18} Parents/guardians whose children are recommended to receive both influenza vaccine and PCV13 should be advised of the increased risk of fever following concurrent administration of these vaccines. Separating administration of these vaccines by two days can be offered, but is not essential.

For the PREVENAR 13® Datasheet please refer to the Medsafe website www.medsafe.govt.nz.

Reporting adverse events following influenza vaccination

Health professionals/vaccinators are professionally and ethically responsible for reporting any serious or unexpected adverse events after the administration of all medicines, including the influenza vaccine regardless of whether or not they consider the event to have been caused by the vaccination.

Information should include:

- individual's details
- the vaccine administered
- vaccine batch number
- date of onset of symptoms
- type and duration of adverse event
- treatment required
- outcome if known but do not delay reporting while waiting outcome information

Some providers are able to report events through their practice management system. Reports can be completed online (<https://nzphvc.otago.ac.nz/carm>), or the form can be downloaded and printed using the above link, completed and mailed to:

Freepost 112002
The Medical Assessor
Centre for Adverse Reactions Monitoring (CARM)
PO Box 913, Dunedin, 9710
or faxed to: (03) 479 7150

Contraindications to receiving influenza vaccine

Who should not receive the vaccine?

Influenza vaccination is contraindicated for individuals who have had documented anaphylaxis to any ingredient in the vaccine except egg,²⁰ or a previous dose of inactivated influenza vaccine. These individuals should not receive the vaccine.

Influenza and children

Influenza vaccine: use in children

Influenza infection rates are generally highest in children.^{4,46,47} Healthy children are also the major cause of the spread of influenza viruses in the community.^{46,47} Vaccination of healthy children has the potential to substantially reduce influenza-like illness and related costs in both the children themselves and their families.⁴⁸

Influenza vaccination recommendations vary between countries. The United States (U.S.) recommends annual vaccination for all persons from 6 months of age.⁴⁹

The United Kingdom influenza vaccination programme includes annual vaccination for all children aged 2–18 years with a live attenuated nasal spray influenza vaccine with the strategy to offer both individual protection and herd immunity.⁵⁰ This type of influenza vaccine is expected to be more effective in children but is not currently available in New Zealand.

New Zealand's current strategy

The current New Zealand strategy for children is to offer free influenza vaccination to those with certain medical conditions most likely to lead to serious influenza-related complications.⁵¹

Children aged 6 months to less than 9 years of age who are receiving the influenza vaccine for the first time should receive two doses four weeks apart, as they may be immunologically naive and so get a better response from a two dose priming regime.³³ Children who have received a previous influenza vaccination need only a single dose.

Age	Dose	Number of doses
6-35 months	0.25 mL	1 or 2*
3-8 years	0.5 mL	1 or 2*
≥9 years	0.5 mL	1

*Two doses separated by at least four weeks if an influenza vaccine is being used for the first time.

Use of paracetamol following vaccination

The routine prophylactic use of paracetamol or any other antipyretic to control fever either prior to or following vaccine administration is not recommended. Evidence shows that the immune response to some antigens can be reduced.⁵² However, there is no evidence that this causes individuals to be less protected from disease.

The current recommendations are as follows:

- Do not use routine prophylactic antipyretics pre- or post-vaccination in the absence of pain or significant discomfort
- Infants who are uncomfortable with fever should first be managed with appropriate removal of clothing and other cooling measures such as cool drinks or tepid sponging
- Only use analgesics (paracetamol or ibuprofen) for relief of pain or significant discomfort post vaccination

Anyone with concerns following vaccination should seek medical advice.

*** NOTE that treatment advice may differ for other groups. For example, it is important to manage fever carefully in pregnant women because of the potential risks to mother and baby. Seek specialist advice as appropriate.**

Influenza and other special patient groups

Immune compromised

Individuals who are immune compromised are at high-risk of severe influenza and complications.

It is important to offer vaccination prior to the initiation of chemotherapy or radiation treatment. When this is not possible, influenza vaccination is recommended and can be given while an individual is receiving treatment. Two doses of vaccine administered four weeks apart are recommended in all age groups undergoing chemotherapy.⁵³ Following cessation of chemotherapy, normal immune responses return after about 30 days. Specialist's advice should be sought when considering influenza vaccination of individuals following haematopoietic stem cell or solid organ transplantation.

Regardless of their age, in the first year of being immune compromised/immunosuppressed individuals are recommended to receive two doses of influenza vaccine administered four weeks apart. Then in subsequent years, only one dose required.⁵⁴

As the response to influenza vaccination in those with a poorly functioning immune systems is likely to be low, additional preventative strategies are important. Influenza vaccination is recommended (although not funded) for those who are in close contact with individuals at high-risk of complications to reduce the risk of spread of the disease to those who are more vulnerable and also may be less likely to mount a strong immune response to the vaccine.

International travel

Studies have indicated that influenza is the most commonly contracted vaccine preventable disease amongst international travellers.^{55,56} Influenza outbreaks have been linked to travellers.⁵⁵⁻⁵⁷ Certain types of travel where large numbers of people are likely to be in close proximity, such as cruise ship voyages^{58,59} or events that include mass gatherings⁶⁰ are particularly high-risk. For these reasons, all people travelling outside New Zealand should consider influenza vaccination pre-travel. This is especially important for those who are at higher risk of influenza complications, many of whom will be eligible for subsidised vaccine.

In tropical countries, influenza activity can occur throughout the year, so vaccination is worthwhile regardless of season. In temperate climates in the northern hemisphere activity is more common between the months of December and March. If a traveller has received the southern hemisphere vaccine in the preceding New Zealand autumn or winter and the same strains are circulating in the northern hemisphere, they should remain protected. If they haven't been immunised in the preceding autumn or winter or it is getting close to 6–8 months since their last influenza vaccination, repeat vaccination is recommended prior to travel. However, depending on stock, influenza vaccine may not be available for private purchase far beyond the funded time period. Anyone receiving an influenza vaccination outside the funded period will need to pay.

If the southern and northern hemisphere vaccine strains differ significantly*, it would be preferable to obtain the local vaccine on arrival. However, vaccination with the southern hemisphere vaccine may offer some protection and would be preferable to having no vaccine. The northern hemisphere vaccine is not available in New Zealand.

*A comparison chart of southern hemisphere and northern hemisphere influenza vaccine strains can be seen on the inside back cover of this booklet.⁶¹

Are there any circumstances where people may consider re-vaccinating within a year, e.g. prior to travel?

Yes. When the available vaccine gives protection against influenza viruses circulating in the northern hemisphere, travellers – particularly those in 'high-risk' groups – who will be exposed to a northern hemisphere influenza season should consider vaccination or repeat vaccination prior to travel.⁵⁶

However re-vaccination prior to travel is not funded. Protective antibodies peak one week to one month after vaccination and then begin to wane.^{10,11} By 6–8 months after vaccination, protective levels are lower and may not be sufficient to provide good protection.

Help protect our mums-to-be and newborns

Influenza affects different population groups disproportionately with pregnant women, the very young, the very old and people with certain health conditions at highest risk of serious complications.

Two important groups at high-risk of disease and serious complications have been recognised since the 1918 influenza pandemic,⁶² they are pregnant women and their babies (up to 6 months of age).^{4,63-70}

Influenza vaccination of pregnant women during any stage of pregnancy has been found to be highly effective in preventing influenza and its complications in the woman and her baby, during pregnancy and for up to 6 months after birth by the passive protection passed on to the growing baby through the placenta.^{26,27,32,71-75}

The World Health Organization recommends influenza vaccination of pregnant women at any stage of pregnancy, and that they are given the highest priority.⁷⁶ Influenza vaccination has been recommended and funded in New Zealand for pregnant women since 2010.

Inactivated influenza vaccine is used in New Zealand. There are no concerns about the safety of influenza vaccination during any trimester of pregnancy.⁷⁷⁻⁸³

The funded influenza vaccine is available in early March for pregnant women. The vaccine will be available until 31 December.

The importance of health professional recommendation for influenza vaccination of pregnant women

There is considerable research to show that patients value the commendation of their health professional.⁸⁴⁻⁸⁶ Studies have indicated that an explanation covering the following three aspects is important.⁸⁴⁻⁸⁷

- 1. The risk of influenza for the pregnant woman, her growing baby and her vulnerable newborn**
- 2. The effectiveness of the vaccine in reducing the risk of influenza for the woman and her baby, both during pregnancy and after birth**
- 3. The excellent safety record of influenza vaccination during pregnancy, and that the potential complications from catching influenza pose a greater threat to the pregnant woman and her baby**

The impact of influenza infection during pregnancy

It is well established that some of the physiological changes that occur during pregnancy leave pregnant women and their growing baby at greater risk of serious influenza complications.^{67,88–90}

Influenza infection during pregnancy can have catastrophic consequences for both mother and baby including premature birth, stillbirth, small for gestational age and perinatal death.^{64–68}

Physiological changes during pregnancy that can lead to complications from influenza include the following:

- **Immune system:** While humoral (antibody mediated) immunity appears to be enhanced, the cellular arm of the immune system is temporarily suppressed. This is to prevent harmful immune responses being directed at the growing baby, which is genetically foreign to the mother. These changes can leave a pregnant woman more vulnerable to some intracellular pathogens including viral infections.^{67,88–90}
- **Physical changes:** Changes in the pelvic region, abdominal and thoracic cavities place pressure on surrounding organs. Lung capacity is decreased and oxygen consumption increased. Blood volume, heart rate and the amount of blood pumped per contraction (stroke volume) are increased.⁸⁸

Risk to the woman

Preliminary data from the SHIVERS hospital-based surveillance for severe acute respiratory infections in Auckland during 2012–2014 identified that pregnant women with influenza were five times more likely to be hospitalised than non-pregnant women.⁹¹ A normally healthy woman who is pregnant has a similar risk for complications from influenza as non-pregnant women who have co-morbidities. This risk increases with gestation. When pre-existing medical

conditions are superimposed on pregnancy the risks become even higher.⁶³

Evidence suggests that pregnant women are even more vulnerable during pandemics.^{64,65}

Risk for the growing baby

Direct vertical transmission of the influenza virus to the growing baby is thought to be extremely rare. The adverse effects observed on the baby in mothers who have influenza are likely to be indirect i.e. as a result of the mother's response to the virus. Maternal influenza infection can be associated with congenital abnormalities caused by fever.⁶⁸ Overall there is an increase of general pregnancy complications in women who have influenza.^{64–67}

Historical studies proposed a possible link between maternal influenza infection during pregnancy and an increased risk of cancer in infants and children, such as leukaemia after the 1957 influenza pandemic, brain tumours or neuroblastomas. The increased risk of cancer in a child born to a mother who had influenza during pregnancy was extremely low as these are rare cancers.⁹²

Risk for young babies

Babies less than 6 months of age have a higher risk of being hospitalised with influenza than other age groups.^{69,70,93} Influenza related complications can include fever related convulsions, vomiting and diarrhea, pneumonia and occasionally brain inflammation.

In Auckland during 2015, infants aged less than 1 year had the highest rate of hospitalisation with a severe acute influenza respiratory infection than all other age groups, 289 cases per 100,000 people compared with 20/100,000 midlife adults and 141/100,000 adults aged 80 years or older.⁴

Immunise to protect pregnant women and their babies

Vaccine efficacy

The immune response to influenza vaccination in pregnant women is similar to that of non-pregnant women.^{94,95} The efficacy (prevention of illness among vaccinated persons in controlled trials) and effectiveness (prevention of illness in vaccinated populations) of influenza vaccines is dependent on several factors. The age and immune status of the recipient are important as well as the match between circulating viral strains and the vaccine.

Influenza vaccination during pregnancy provides “two for one” protection, reducing the maternal risk of influenza disease and associated complications and the risk for their baby during the first 6 months after birth.^{26,27,32,71–75}

A review of acute respiratory illness (ARI) and influenza vaccination during pregnancy over the 2012 and 2013 Australian influenza seasons identified that women who received an influenza vaccination during their pregnancy were 81% less likely to attend an emergency department with an ARI, and 65% less likely to be hospitalised than pregnant women who were not vaccinated.³²

An increase in circulating maternal influenza antibodies after vaccination supports maximum transplacental antibody transfer to the growing baby and protection against influenza after birth.⁹⁵ Babies born during an influenza season in 2002–2005 in the U.S. were followed until they were aged 6 months. Those born to mothers who received an influenza vaccination during pregnancy were 41% less likely to have laboratory-confirmed influenza and 39% less likely to be admitted to hospital with an influenza-like illness than babies whose mother didn’t have an influenza vaccination.²⁶

Safety of influenza vaccine in pregnant women and their babies

Inactivated influenza vaccines have been recommended for and used in pregnant women since the 1960s. No safety concerns about influenza vaccination during any trimester of pregnancy have been identified in studies of millions of vaccine doses administered to pregnant women.^{77–83}

Influenza vaccination during pregnancy has not been associated with any increase in pregnancy complications,⁸⁰ or the occurrence of congenital malformations.^{78,82} Maternal influenza vaccination has been associated with a lower incidence of stillbirths, when vaccinated women were compared with unvaccinated women.^{77,83}

Poor vaccination uptake

Within New Zealand, influenza vaccination of pregnant women has been very modest. The most significant barriers to vaccination during pregnancy are a lack of information about influenza disease and potential complications, and the “two for one” benefit of maternal influenza vaccination, no recommendation from the woman’s Lead Maternity Carer or other health professionals involved in her care, and structural barriers to accessing services through general practice.⁹⁶ The NIR records influenza vaccination for pregnant women. Refer to the section on Recording influenza vaccinations on the NIR on page 7.

Questions and answers for pregnant women

When is the best time to be vaccinated?

Influenza vaccination can be given at any time during pregnancy. It is preferable to vaccinate as soon as the vaccine is available (usually from early March) well before the start of winter. The funded vaccine is available through to 31 December.

How many doses do I need?

Just one dose of influenza vaccine is required each year.

I've had a history of miscarriage. Is it OK to receive the vaccine?

Yes. Influenza vaccination does not increase the risk of miscarriage. However, catching influenza can increase the risk.

I am pregnant and want the influenza vaccination but I have a cold, should I still get it?

If you don't have a high fever and are only experiencing a cold, runny nose or sniffles, it's okay to receive the vaccination. However, if you are very unwell, wait until you are better. If in doubt, check with your Lead Maternity Carer, doctor or practice nurse.

I have just had my baby, can I have the influenza vaccination? Will it protect my baby if I am breastfeeding?

It is safe for a breastfeeding woman to have the influenza vaccination. Breastfeeding may offer some initial influenza protection to your baby. However, babies will have more protection if their mother is vaccinated during pregnancy.

Is the influenza vaccine a live vaccine?

No. The seasonal influenza vaccine does not contain any live viruses; the influenza viruses are completely inactivated and cannot give you influenza.

Are there any preservatives in the influenza vaccine, e.g. thiomersal?

No. The vaccine used in New Zealand is preservative free.

I had an influenza vaccination last year, why do I need it this year?

Yearly vaccination is recommended for two reasons: first, because protection lessens over time; and second, because the circulating influenza viruses can change and the strains in the vaccine usually change each year in response to the changing virus pattern.

I am pregnant and work with children, should I have the influenza vaccination?

Yes. Influenza infection rates are generally highest in children, and they are a major source of the spread of influenza. The influenza virus may be found in respiratory secretions (breathing, coughing and sneezing) for two weeks or longer in children. Your risk of exposure to the influenza virus is higher and, as you are pregnant, so is your risk of influenza disease and serious complications.

Young babies are also at high-risk of influenza and complications, it is important to vaccinate those around them to stop the spread of influenza to them.

Vaccination and Breastfeeding

The influenza vaccine can be given to a breastfeeding woman. Protecting the mother can help prevent her becoming infected and transmitting influenza to her baby. Breastfeeding may offer some protection against influenza.

Southern hemisphere vaccine vs Northern hemisphere vaccine

The 2016–2017 northern hemisphere vaccine is different to the 2017 southern hemisphere vaccine.^{12,61}

Southern hemisphere influenza vaccine for 2017¹²

Trivalent vaccines

- A/Michigan/45/2015 (H1N1)pdm09-like virus
- A/Hong Kong/4801/2014 (H3N2)-like virus
- B/Brisbane/60/2008-like virus

Quadrivalent vaccines will also include

- B/Phuket/3073/2013-like virus

Northern hemisphere influenza vaccine for 2016–2017⁶¹

Trivalent vaccines

- A/California/7/2009 (H1N1)pdm09-like virus
- A/Hong Kong/4801/2014 (H3N2)-like virus
- B/Brisbane/60/2008-like virus

Quadrivalent vaccines will also include

- B/Phuket/3073/2013-like virus

Note: these strains are the same as for the Southern hemisphere influenza vaccine for 2016

The list of references is available in a separate document in the Resources section of the www.influenza.org.nz website

Influvac® (inactivated influenza vaccine, surface antigen): Single-dose 0.5 mL pre-filled glass syringe with needle, 1's and 10's. **Indication:** For the prevention of influenza caused by influenza virus, types A and B in adults and children older than 6 months in accordance with the recommendations in the National Immunisation Guideline. **Contraindications:** Hypersensitivity to eggs, chicken, gentamycin, formaldehyde, cetrimonium bromide, polysorbate 80 or other constituent of the vaccine. Acute febrile illness. **Precautions:** Thrombocytopenia, bleeding disorder (administer SC); immuno-compromised; previous Guillain-Barre syndrome. **Interactions:** Warfarin, theophylline, phenytoin, phenobarbitone and carbamazepine. **Adverse reactions:** Local reactions, headache, fever, malaise, allergic reactions leading to shock, post-vaccination neurological disorders such as encephalomyelitis, neuritis and Guillain-Barre syndrome. **Dosage:** **influvac®:** Adults & children 3 years and older: 0.5 mL; Children from 6 months up to 35 months: 0.25 mL is recommended. Children 6 months to 9 years not previously vaccinated, and immuno-compromised persons – two doses at least four weeks apart. **Administration:** IM or deep SC injection. **Presentation:** Single dose 0.5 mL pre-filled glass syringe with 16mm needle, 1's, 10's **Minimum Data Sheet Updated:** 16 December 2015.

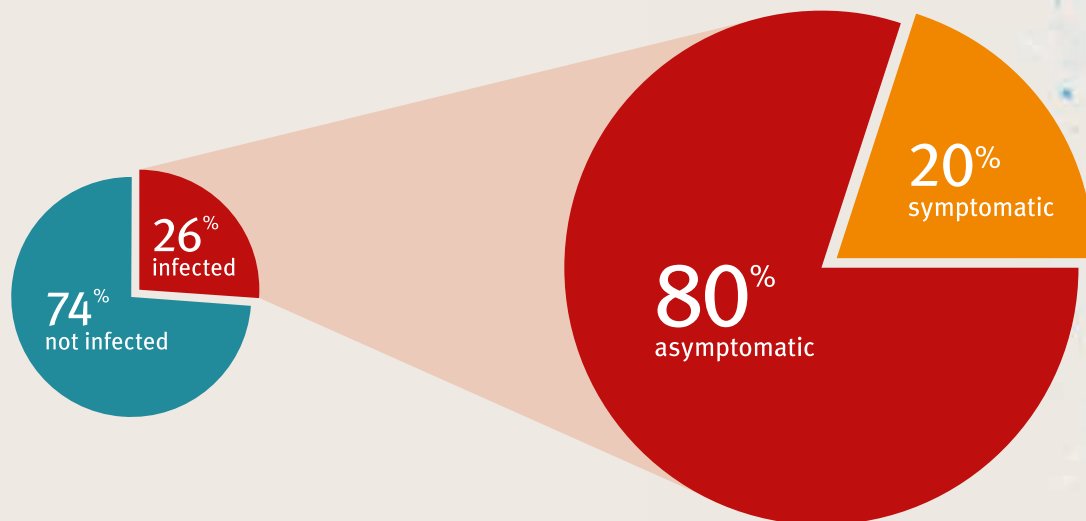
INFLUVAC® is a Prescription Medicine. Before you administer this vaccine, please read the Data Sheet (at www.medsafe.govt.nz and www.influenza.org.nz) for information on the active ingredients, contraindications, precautions, interactions and adverse effects. TAPS PP9167. IMAC1700.



New data: 4 out of 5 people infected show no symptoms of influenza

In 2015, the SHIVERS Serosurvey started to help us understand the immunity people in the community have against influenza.

The latest results showed that 26% of people were infected with influenza and **4 out of 5 influenza carriers were asymptomatic**.³ These carriers could have spread the virus among their family, co-workers, classmates and patients without ever realising it.



And once spread, influenza has a serious effect on our community

Other SHIVERS data showed that when applied to the New Zealand population:

- 31,850 sought help at their GP
- 2,209 were hospitalised

Help prevent the potentially devastating effects of influenza in your community

Recommend immunisation for your patients
Please make sure you get immunised

The Southern Hemisphere Influenza and Vaccine Effectiveness, Research and Surveillance (SHIVERS) Serosurvey

This serosurvey study aimed to find out if participants:

- developed immunity to influenza by the end of the winter
- had influenza during the winter AND
- to contribute to understanding about influenza infection in the community

Study Overview: The study took place between February and November 2015 and involved about 1500 adults and children randomly selected from general practices in Auckland. After a short health survey a blood sample was taken before the influenza season, and from May to September, regular weekly contact was used to check for cold or influenza symptoms. For those meeting the influenza-like-illness case definition, and who hadn't visited a GP, a nose or throat swab was taken to test for viruses or bacteria that cause influenza, colds or sore throats. At the end of winter a longer questionnaire was completed and a second blood sample was collected. Detection of influenza RNA or antibody against haemagglutinin was used to estimate influenza infection rates.

For more information, visit: <http://www.esr.cri.nz/health-science/our-work/shivers/>