Influenza (flu)

Influenza is a highly infectious, viral infection of the lungs and airways

Key messages

- **Influenza (flu) is a viral infection that spreads easily from person to person. When an infected person coughs, sneezes or talks, the virus can disperse into the air and infect those close by and live on hands or surfaces for up to 24 hours.**
- **Influenza occurs throughout the world; outbreaks peak during the winter months of the northern and southern hemispheres and occur year-round in the tropics. Travellers may also be exposed to influenza outside of the typical season if in contact with an infected person.**
- **Influenza is usually self-limiting with recovery within two to seven days; severe illness and death can occur, particularly in infants under 6 months of age, older people and those with pre-existing medical conditions.**
- **The three main ways to prevent influenza are vaccination, good cough and hand hygiene and for some individuals, in some circumstances, antiviral medication.**
- **In the UK, annual vaccination is recommended for some individuals prior to the start of the influenza season to provide protection to those who are at higher risk of severe illness.**

Overview

Note: Avian influenza (bird flu) is not covered in this factsheet, for information on this topic, see our avian influenza in brief article.

Influenza (flu) is a common viral infection affecting the lungs and airways; symptoms appear rapidly but last a relatively short period of time. In healthy individuals, influenza usually resolves without treatment, with recovery within two to seven days [1]. However, influenza can occasionally cause

severe illness or death, especially in vulnerable groups [1, 2].

There are three types of influenza viruses which affect humans, types A, B and Cs [1, 2]. Influenza A and B viruses cause outbreaks and epidemics. Only influenza type A viruses are known to have caused pandemics (i.e. worldwide spread of a new disease) [2]. Influenza type C virus usually causes mild infections and is detected much less frequently. The relevant strains of influenza viruses to be included in influenza vaccines are determined each year by the World Health Organization (WHO) [3, 4].

Influenza is among the most prevalent infectious diseases in travellers [5-7]. Those who are vulnerable to severe disease should ensure they have received the vaccination within the last year. Vaccination is the most effective way to prevent influenza [2].

Risk areas

Influenza occurs throughout the world. In temperate regions of the northern hemisphere, most influenza activity is from October to March. In the southern hemisphere most influenza activity occurs between April and September [8]. In the tropics, influenza viruses can circulate throughout the year [2]. Travellers may be exposed to influenza outside of the typical season if in contact with a person from a country experiencing influenza outbreaks [7].

Up to date worldwide information on influenza activity is available from the World Health Organization (WHO)/ FluNet. Data on influenza activity in Europe is also available from the European Centre for Disease Prevention and Control and WHO Europe.

Risk for travellers

Influenza has been described as the most frequent vaccine preventable infection among travellers to tropical and subtropical countries [5-7, 9].

The risk of exposure to influenza during travel depends on time of year, type of travel, destination and duration. Transmission and spread of influenza infection is accelerated in crowded environments (e.g. during travel by aeroplane, cruise ship or when attending mass gatherings) [5, 10]. On aeroplanes, effective air ventilation systems can reduce the spread of air-borne viruses such as influenza, but these may not be operational during boarding and disembarking [5]. Busy transport hubs such as airports will bring together people from all over the globe and infections can be passed on whilst queuing at check-in, security screening, immigration and whilst on crowded buses between gates and aircraft [5].

Likewise, modern cruise ships can have excess of 6,000 passengers and up to 2,300 crew members from all parts of the world, with communal dining/activities leading to close contact. Influenza is reported to be the second most frequently reported infectious illness after gastroenteritis on cruise ships [5].

There is limited data on foreign travel-related cases of influenza in the UK, as travel history is not routinely collected for influenza cases.

Transmission

Influenza virus spreads easily from person to person. When an infected person coughs, sneezes or talks, the virus can land on those close by and live on hands and surfaces [11]. Individuals can pick up the infection by breathing in the virus or from touching a surface or object that has the virus on it and then touching their own mouth, nose, or possibly their eyes [11]. Crowded, enclosed environments facilitate transmission [1].

Most healthy adults may be able to infect others from 1 day before symptoms develop and up to 5 to 7 days after becoming ill. Children, and some people with weakened immune systems, may pass the virus on for longer than 7 days [11].

Signs and symptoms

Classic symptoms of influenza are the sudden onset of fever, chills, headache, cough (usually dry), extreme fatigue, sore throat, runny nose and muscle and joint pain [1, 2]. Influenza can affect all age groups, and the burden of disease on each age group can vary from season to season, depending on the strains circulating.

Although infection usually resolves without treatment, it can be complicated by secondary infections (such as bronchitis, bacterial pneumonia and ear infections). Influenza may exacerbate underlying medical conditions leading to life threatening illness. The elderly, the very young and those with serious medical issues e.g. chronic (long-term) heart conditions, chronic respiratory conditions and immunosuppression, are particularly at risk. Unusually, influenza may be complicated by encephalitis (inflammation of the brain) and meningitis (infection of the protective membranes that surround the brain and spinal cord) [1].

In 2009/2010 a pandemic virus influenza A(H1N1)pdm09 generally caused a mild disease in children and young adults, however, severe cases and deaths did occur in these age groups. In the UK, most deaths were in those younger than 65 years old, the majority of whom suffered from an underlying illness, although deaths in previously healthy individuals were documented. Pregnant women were also at higher risk of severe illness [12]. This virus continues to circulate globally [13].

Diagnosis and treatment

Formal testing and treatment with antivirals are not required for most healthy individuals as most will recover with only medication to help with symptoms. Diagnosis of influenza by clinical signs and symptoms has been made more challenging by the similarity of presentation of coronavirus (COVID-19) [14]. Recommendations on the use of influenza diagnostic tests and the use of antiviral medications for prevention and treatment of influenza are available from UK Health Security Agency [14].

Preventing influenza

Vaccination against influenza is the most effective way of preventing the illness [1]. See 'Vaccine information' section for details on who should be offered vaccination for personal protection by the NHS.

Travellers are also advised to take the following precautions to reduce their risk of exposure to respiratory infections and prevent spreading them:

- Avoid close contact with symptomatic individuals where possible.
- Avoid crowded conditions where possible.
- Practise frequent hand washing and avoid touching your eyes, nose and mouth.
- Practise 'cough hygiene': sneezing or coughing into a tissue and promptly discarding it safely, and frequent hand washing.
- Avoid travel if unwell with influenza-like symptoms.

In the UK, there are licensed antiviral drugs that can be considered (in addition to vaccination) in certain circumstances for protection against severe influenza, or for treatment of infection for those who are indicated; health professionals should follow UKHSA guidance on use of antiviral agents for the treatment and prophylaxis of seasonal influenza.

Vaccine information

In the UK, influenza vaccines are prepared using virus strains recommended annually by WHO. The vaccine formulation is reviewed and changed as necessary to provide protection against strains of influenza viruses that are predicted to circulate in a given season. Information on epidemiological trends and circulating influenza viruses are gathered by WHO, to ensure the closest possible match between circulating influenza viruses and influenza vaccines [13].

In the UK, influenza vaccines are prepared more than 6 months in advance of the northern hemisphere winter season. The vaccines are either trivalent (containing two influenza A subtypes and one influenza B subtype) or quadrivalent (containing two influenza A subtypes, and two influenza B subtypes) [2].

All but one influenza vaccine currently used in the UK are inactivated. The vaccines do not cause clinical influenza in those who are vaccinated [1]. One vaccine, the intranasal administered vaccine (a nasal spray squirted up each nostril), contains attenuated (weakened), cold adapted viruses, which cannot replicate at body temperature. The live virus vaccine may cause symptoms of a mild cold [1].

Following vaccination, protection is thought to last for at least three to six months. After vaccination, protective immune responses may be achieved within 14 days [1].

Further information on the influenza programme in the UK, is available from UK Health Security

Agency (UKHSA).

Indications for use of vaccine

The aim of the UK's influenza programme is to protect those most vulnerable to serious illness or death if they develop influenza including:

- older people (aged 65 years and above)
- pregnant women
- those in clinical risk groups (such as those with respiratory or cardiac disease or a weakened immune system - see below)

In addition, a vaccination programme for children provides individual protection to the children and reduces transmission to the wider population.

Influenza vaccine becomes available annually in the UK in September/October.

Clinical risk groups

- asplenia (absent spleen) or splenic dysfunction (spleen not fully functioning)
- chronic (long-term) respiratory disease
- chronic heart and vascular disease
- chronic kidney disease
- chronic liver disease
- chronic neurological (nervous system) disease
- diabetes and adrenal insufficiency
- immunosuppression (weakened immune system)
- morbidly obese (defined as having a BMI of 40 and above)
- pregnant women

In addition, vaccination is recommended for:

- those living in long stay care facilities
- health care and social care workers with direct patient or service user contact
- carers of disabled or vulnerable individuals
- household contacts of people with weakened immune systems

The list above is not exhaustive. UKHSA states that influenza vaccine can be offered to others based on the clinical judgement of a health professional [1].

In the UK, vaccination is not routinely recommended for travellers who are not in the groups already invited for NHS vaccination. Health professionals should carefully assess the risk of influenza for these travellers and consider recommending vaccination, given as a non-NHS service. In the UK, northern hemisphere influenza vaccines for the winter season usually become available

in October. Most of the stock is used over the winter and supplies may not be available during the spring and summer months. Currently, the southern hemisphere vaccine (which may contain different strains of influenza viruses as recommended by WHO) is not available in the UK.

See Immunisation against infectious disease (the 'Green Book' Influenza chapter) for further information on the influenza vaccine including details on the vaccine schedules, routes of administration and dosages.

Detailed vaccine information can also be found in the manufacturer's Summary of Product Characteristics (SPC) on the electronic medicines compendium (emc).

Contraindications

Very few individuals are unable to receive any influenza vaccine. As with all vaccines, anyone with a moderate to severe acute febrile illness should delay vaccination until they have recovered.

The vaccine should not be given to anyone with a confirmed anaphylactic reaction to a previous dose of the vaccine, or to any component of the vaccine [1]. However, the Joint Committee on Vaccines and Immunisation (JCVI) has advised that children with an egg allergy, including those with previous anaphylaxis to egg, can be safely vaccinated with the live attenuated influenza vaccine (LAIV) in any setting (including primary care and schools). The only exception is for children who have required admission to intensive care for a previous severe anaphylaxis to egg, for whom no data are available; such children are best given a vaccine in the hospital setting (see Immunisation against infectious disease (the Green Book) influenza chapter for full details) [1].

Inactivated influenza vaccines that are egg-free or have a very low ovalbumin content are available [1], see Green Book, influenza chapter link above.

JCVI have advised (2019) that, on the basis of recent data, children with asthma on inhaled corticosteroids may safely be given LAIV, irrespective of the dose prescribed. LAIV is not recommended for children and adolescents currently experiencing an acute exacerbation of severe asthma or active wheezing and/or needed additional bronchodilator treatment in the previous 72 hours [1]. Such children should be offered a suitable inactivated vaccine.

There is limited safety data in children who require regular oral steroids for maintenance of asthma control or have previously required intensive care for asthma exacerbation - such children should only be given LAIV on the advice of their specialist and an alternative inactivated influenza should be offered where appropriate [1].

The LAIV should not be given to immunosuppressed individuals. Pregnant women should be offered an inactivated vaccine.

There is a potential for influenza antiviral agents to lower the effectiveness of LAIV. LAIV should be delayed until 48 hours following the cessation of treatment with influenza antiviral agents.

Practitioners should refer to Immunisation against Infectious Disease (the 'Green Book') influenza chapter for further guidance and seek specialist advice if appropriate.

Adverse events

Transient reactions such as soreness, swelling or redness at the site of injection can occur. Fever, malaise (tiredness) and other systemic symptoms are also reported [1].

Following administration of LAIV, symptoms such as nasal congestion and a runny nose, headache, reduced appetite, and weakness occur commonly [1].

Rarely, other more serious adverse events (i.e. convulsions, nerve pain and a temporary low platelet count in the blood) have been reported following influenza vaccination. However, no relationship between vaccination and these adverse events has been established [1]. Please refer to Immunisation against infectious disease (the 'Green Book') influenza chapter for detailed information.

Allergic reactions such as angioedema (swelling of the lower layer of skin and tissue just under the skin or mucous membranes), bronchospasm (swelling and narrowing of breathing tubes leading to difficulties with breathing) and urticaria (hives), or full anaphylaxis (where these symptoms occur together very quickly and are life-threatening) can rarely occur and are usually due to hypersensitivity to egg protein [1].

Resources

- UK Health Security Agency, 'Green Book' Immunisation against infectious disease Chapter 19 Influenza
- UK Health Security Agency: National flu immunisation programme plan
- UK Health Security Agency: Influenza: treatment and prophylaxis using anti-viral agents
- UK Health Security Agency: Influenza vaccines marketed in the UK - Ovalbumin content
- World Health Organization: Influenza

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