Influenza (flu)

Influenza is a highly infectious, viral infection of the respiratory tract

Key messages

- **Influenza (flu) is a viral infection that spreads easily from person to person. When an infected person coughs or sneezes, the virus can land on those close by and live on hands and 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.**
- **Influenza is usually self-limiting with recovery within two to seven days; severe illness and death can occur, particularly in those with pre-existing medical conditions.**
- **The three main ways to prevent influenza are vaccination, good cough and hand hygiene and 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. For the winter season 2021-2022 the Department for Health and Social Care (DHSC) have announced the expanded vaccination programme will remain in place to protect vulnerable people and support the NHS during the COVID-19 pandemic.**
- **In addition to vaccination, special antiviral medications may be considered for some individuals, in some circumstances, either as treatment or prevention.**

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 is a viral infection of the respiratory tract; symptoms appear rapidly but last a relatively short period of time. In healthy individuals, influenza is usually self-limiting (i.e. it resolves without treatment), with recovery within two to seven days [1].

There are four types of influenza viruses, types A, B, C and D [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 and influenza type D mainly affects cattle and is not known to cause human illness [2].

In April 2009, an influenza A/H1N1 virus of swine origin was the cause of a global pandemic which continued until July 2010 [3]. Influenza A(H1N1) pdm09, continues to circulate globally [4].

The relevant strains of influenza viruses to be included in influenza vaccines are determined each year by the World Health Organization (WHO) [5, 6].

Risk areas

Influenza occurs throughout the world. In temperate regions of the northern hemisphere, most influenza activity is from November to March (between December and March in the United Kingdom). In the southern hemisphere most influenza activity occurs between April and September. In the tropics, influenza viruses can circulate throughout the year.

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

Risk for travellers

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

The risk of exposure to influenza during travel depends on time of year, type of travel, destination and duration. However, travellers can be at risk during the summer months at their destination, particularly if travelling in large groups that include tourists from other regions of the world where influenza viruses are currently circulating [10]. Transmission and spread of influenza infection is accelerated in crowded conditions (e.g. during travel by air plane, cruise ship or when attending mass gatherings) [7].

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 or sneezes, the virus can land on those close by and live on hands and surfaces for up to 24 hours [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 is usually self-limiting, 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].

Pandemic influenza A (H1N1) pdm 09 in 2009/10 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].

Diagnosis and treatment

During the influenza season, diagnosis is usually made by consideration of clinical signs and symptoms; specific testing for influenza virus (laboratory diagnosis) is usually only indicated in cases of complicated influenza [13], or for surveillance purposes.

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.

Travellers are 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.
- Avoid crowded conditions where possible.
- Practise frequent hand washing.
- 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 guidance on prophylaxis and treatment from the National Institute for Health and Care Excellence (NICE).

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 [4].

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).

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 approximately one year, although this may be less for the elderly. After vaccination, antibody levels take 10 to 14 days to reach protective levels [1].

Further information on the influenza programme in the UK, is available from UK Health Security Agency (UKHSA) formerly Public Health England.

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 50 years and above).
- The very young.
- Pregnant women.
- Those with underlying disease such as chronic respiratory of cardiac disease.
- Those who are immunosuppressed.

Further details are available from UKHSA annual national flu immunisation programme plan.

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

Influenza activity levels were extremely low globally in the winter season 2020 to 2021 due to the COVID restrictions in place. As a result, a lower level of population immunity against influenza is expected for winter 2021 to 2022. As social mixing returns towards pre-pandemic levels, it is possible the 2021 to 2022 winter influenza season could be larger and begin earlier than usual [14].

For the winter season 2021-2022, the DHSC will extend the expanded influenza vaccination programme in use last season to include all children aged 2 to 15 on 31 August 2021, and people aged 50 to 64. See the national flu immunisation programme 2021 to 2022 letter for full details [14].

Clinical risk groups

- Asplenia (absent spleen) or splenic dysfunction (spleen not fully functioning).
- Chronic (long-term) respiratory disease.
- Chronic heart disease.
- Chronic renal (kidney) disease.
- Chronic liver disease.
- Chronic neurological (nervous system) disease.
- Diabetes.
- 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 an non-NHS service, if the proposed trip will be during the influenza season at the destination 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 LAIV in the hospital setting (see Immunisation against infectious disease (the Green Book) influenza chapter for full details) [1].

Most influenza vaccines in the UK are prepared from viruses grown in embryonated hen's eggs. Influenza vaccines with egg albumin content greater than 0.12 µg/ml, or where the content is not stated, should not be given to egg allergic individuals. Some influenza vaccines are either 'egg free' or have very low ovalbumin content. The ovalbumin content of available influenza vaccines and guidance on their use for individuals with egg allergy is available from UKSA [1].

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]. 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.

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 and other systemic symptoms are also reported [1].

Following administration of LAIV, symptoms such as nasal congestion and a runny nose, headache 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
- Public Health England: National flu immunisation programme plan
- Public Health England: Influenza: treatment and prophylaxis using anti-viral agents
- Public Health England: Influenza vaccine - Ovalbumin content 2021-22 season
- World Health Organization: Influenza

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Published Date: 11 Nov 2021

Updated Date: 11 Nov 2021