



# The Essentials of Flu Vaccines

There are three types of seasonal influenza viruses that infect humans and cause illness. However, only types A and B cause seasonal global epidemics. There are numerous subtypes of influenza A viruses, which vary in the surface proteins HA (haemagglutinin) and neuraminidase (NA).

Since 2009, mainly variants of influenza A subtypes A(H1N1) and A(H3N2) as well as influenza B viruses have been circulating seasonally. There are also genetically different variants of influenza B viruses, called lineages. Variants of the Yamagata lineage and Victoria lineage circulate all around the world.



**Different influenza virus variants circulate in each season, as the surface antigens of the viruses constantly change during propagation.**

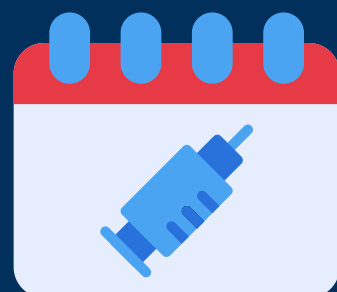


## Vaccination can protect against the disease caused by influenza viruses.

The disease is called influenza or the flu. It is characterised by a sudden onset of symptoms that are also common to other respiratory diseases. The component in the vaccine that triggers a targeted immune response is haemagglutinin (HA).



Flu vaccines are given an initial marketing authorisation. Each year, they must be adapted to the virus variants that are expected to circulate. An application for the master adaptation must be submitted and approved.



**Vaccinations should be carried out annually with an appropriately adapted vaccine.**

## WHO Recommends Flu Vaccine Composition



Reference laboratories (such as the National Reference Centre for Influenza, which is based in Germany at the Robert Koch-Institut) monitor which influenza viruses are circulating and send their results to the World Health Organization (WHO).

The WHO evaluates the results and issues recommendations for the northern and southern hemispheres as to which virus strains should be contained in the vaccine.



In the EU, the Committee for Medicinal Products for Human Use (CHMP) at the European Medicines Agency (EMA) decides which virus strains are suitable for vaccine production on the basis of the WHO's recommendation.

## Vaccine Production

Virus seeds for virus cultivation are obtained by manufacturers through WHO reference laboratories. Cultivation takes place in incubated chicken eggs or in cell cultures. The vaccines are produced from these viruses or virus components.



## It's a Match?

It is possible that during the influenza season the antigens of one or more of the virus variants recommended for the vaccines are not a perfect match. This could be the case if virus variants other than those predicted have become more prevalent. The progress and complications of the disease are nevertheless mitigated by the vaccination (also by any existing residual immunity).



## Vaccine Types

Both inactivated and live virus vaccines are produced, with the latter used only for children and adolescents. Vaccines may contain antigens from two A subtypes and one B lineage (trivalent = three virus strains) or from two A subtypes and two B lineages (tetraivalent = four virus strains). Since the 2018/2019 season, the Standing Committee on Vaccination (STIKO) has only recommended tetraivalent influenza vaccines for annual influenza vaccination in Germany.



## Vaccines Used Only after Batch Testing at the Paul-Ehrlich-Institut

Flu vaccines may only be sold and used in Germany after the Paul-Ehrlich-Institut has reviewed and approved the master adaptation and the batch release for the adjusted vaccines has been issued. During the season, the Paul-Ehrlich-Institut provides weekly information on the number of doses of influenza vaccine that have been approved.

