

Adjuvanted influenza vaccines

Influenza vaccination is a critical tool in preventing illness, reducing severe outcomes and minimising the overall burden of influenza.

Vaccination in high-risk individuals, including older people, offers protection against severe influenza illness, hospitalisation and lowers the risk of major adverse cardiovascular events.

For the elderly, adjuvanted influenza vaccines have been shown to offer modest improvements in immune response and effectiveness against influenza-related primary care visits and hospitalisations compared with non-adjuvanted influenza vaccines.

Influenza disease risk

People aged 65 years or older are at a higher risk for influenza-related mortality. Research indicates that this age group accounts for 7–8 out of 10 influenza-related deaths and 5–7 out of 10 influenza-related hospitalisations each flu season.¹

The urgent need for more effective influenza vaccines in the elderly population arises from unique challenges and vulnerabilities associated with ageing. A natural decline in the immune system's effectiveness is a phenomenon known as immunosenescence. This age-related weakening of the immune response makes older people more susceptible to infections, such as influenza.

Benefits of influenza vaccination

Vaccinated elderly people who are exposed to influenza are less likely to develop severe illness^{2,3}, be hospitalised⁴⁻⁷ or require admission to an intensive care unit, compared with unvaccinated individuals.⁸ Standard influenza vaccination is also associated with a 36% [95% CI 16–51%] lower risk of major adverse cardiovascular events.⁹

Benefits of influenza vaccines vary from season to season and by age group and other factors, such as comorbidities. It is estimated that small improvements in influenza vaccine effectiveness can lead to significant reductions in the burden of disease.

Mathematical modelling in the US has estimated that a 5% absolute increase in vaccine effectiveness would prevent more than 1,000,000 influenza cases and 25,000 hospitalisations in those aged ≥ 65 years, and 785,000 influenza cases and 11,000 fewer hospitalisations in adults aged 18–64 years.¹⁰ The benefit of improved vaccine effectiveness is greater in those aged ≥ 65 years, while improvements in coverage have a greater impact in age groups ≤ 65 years.

What is an adjuvant?

The inclusion of an adjuvant intends to broaden the immunogenic response. This provides some benefit to the elderly who could be experiencing immunosenescence.

Fluad Quad contains MF59, a squalene-based, oil-in-water emulsion adjuvant, that has been used in influenza vaccines since 1997. Squalene is a naturally occurring substance, found in humans and other animals, and is highly purified during the vaccine manufacturing process.

Why are adjuvants added to influenza vaccines?

An adjuvant heightens the immune response to a vaccine antigen. This provides some additional benefit to the elderly who could be experiencing a natural decline in immune function.

Benefits for ≥ 65 years

For adjuvanted trivalent and quadrivalent influenza vaccines, studies have found a modest improvement in vaccine effectiveness in individuals, aged 65 years and older, vaccinated with an adjuvanted vaccine, compared with standard influenza vaccines.

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Data suggests that adjuvanted influenza vaccines can reduce respiratory-related hospitalisations^{11,12} and influenza-related primary care consultations, compared to standard influenza vaccines.¹³

Adjuvanted vaccine safety

Influenza vaccines are generally well tolerated. As a result of the enhanced responsiveness in adjuvanted vaccines, there can be an increased likelihood of local (such as redness, swelling, and pain at the injection site) and/or systemic reactions (such as fever, chills and body aches) compared to standard, non-adjuvanted vaccines.¹⁴⁻¹⁶ The MF59 adjuvant has an excellent safety record.¹⁷

Effectiveness data

The effectiveness of adjuvanted influenza vaccines has been examined in a number of studies performed in different settings.

A study examining relative vaccine effectiveness (rVE) for influenza vaccines in US adults over the age of 65 years during two flu seasons over the 2017- 2019 period, found that those who received adjuvanted trivalent influenza vaccine had fewer influenza-related medical encounters compared to those who received a standard quadrivalent influenza vaccine. The authors note that this study evaluated the rVE specifically in older adults with underlying medical conditions, a subgroup who is at high risk of influenza and severe complications – yet are often excluded from randomised controlled trials. The adjuvanted vaccine was 7.1% [95% CI 3.3-10.8] and 20.4% [95% CI 16.2-24.2] more effective at preventing influenza-related medical encounters, for the 2017-2018 and 2018-2019 flu seasons, respectively.¹²

A similar US study comparing the efficacy of the adjuvanted trivalent influenza vaccine with a non-adjuvanted trivalent vaccine in aged-care residents, showed that the adjuvanted influenza vaccine reduced primary care consultations and respiratory related hospitalisations. Pneumonia, influenza and all-cause hospitalisation rates were lower for the adjuvanted vaccine cohort.¹¹

Over three influenza seasons (2017-2020) in the US, the use of adjuvanted influenza vaccine in adults aged from 65 years was shown to improve vaccine effectiveness against influenza-related medical encounters, compared with standard egg-based vaccines (overall relative vaccine effectiveness point estimate range 20.8-27.5%).¹⁸

A recent systematic review examining real-world data found that adjuvanted trivalent influenza vaccines were more effective than standard trivalent and quadrivalent influenza vaccines in reducing influenza-related outcomes in older adults. The relative vaccine effectiveness (rVE) of adjuvanted influenza vaccines ranged from 7.5% to 36.3% against standard influenza vaccines in reducing medical encounters and hospitalisations.¹⁹

In the interest of reducing uncertainties surrounding variations in single-season vaccine effectiveness estimates, a cohort study estimated the relative effectiveness of trivalent adjuvanted influenza vaccines versus non-adjuvanted trivalent/ quadrivalent influenza vaccines in preventing all- cause hospitalisation over 18 consecutive flu seasons. The study found that the adjuvanted vaccine cohort was associated with a 12% [OR 0.88, 95% CI 0.80-0.97] lower chance of hospitalisation for older adults.²⁰

A study that expands on CDC mathematical modelling to estimate the number of additional influenza-related outcomes averted with adjuvanted versus standard influenza vaccines, found that adjuvanted trivalent influenza vaccines were more effective, preventing twice as many influenza illnesses over three seasons in adults over the age of 65 years. Proportionate decreases were also observed in related healthcare use and complications.²¹

In large-scale post-licensure studies of community-dwelling adults aged ≥ 65 years, adjuvanted influenza vaccine was between 4.7% and 33% more effective in preventing hospitalisation from influenza or pneumonia, compared to standard influenza vaccines.²²⁻²⁴

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