



Influenza is responsible for significant levels of sickness and death each year, and many countries support vaccination to help protect those at risk. As a result, there is much evidence on the burden of disease and the potential benefits of immunization that can help inform vaccination policy making.

Executive Summary

- **Influenza is a major burden on public health causing up to one million deaths annually.** Each year influenza attacks approximately 5–10% of adults and 20–30% of children worldwide, leading to significant levels of illness, hospitalization and death.
- **Several groups are at higher risk.**
 - **The elderly.** Older adults are at increased risk of serious illness and death from influenza. Limited new data suggest deaths may be higher in low- and middle-income countries.
 - **Those with chronic illnesses.** The risk of influenza-associated morbidity and mortality is higher in those with cardiovascular, pulmonary, metabolic, renal and immune-suppressing conditions.
 - **Young children.** Children suffer from the highest rates of influenza infection and act as an important source of transmission. Those aged < 2 years are at greater risk of hospitalization and death. Data show the burden of influenza may be higher in children in developing countries.
 - **Pregnant women.** Pregnancy is a risk factor for complications and more severe disease.
- **Vaccination is the most effective measure at preventing influenza and its severe outcomes.** Commonly-used vaccines are 70–90% effective at preventing influenza in healthy adults when matched to circulating strains. Many countries support immunization for risk groups.
- **Vaccination can help protect those at risk.** Vaccines can prevent up to 60% of severe illnesses and complications in the elderly and 80% of deaths, and can reduce hospitalizations and fatalities in at-risk adults. Vaccines may also help protect children, pregnant women and newborn infants.

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Public Health Benefits of Immunization

Seasonal Influenza Vaccination Series: Paper 1



IFPMA

**Influenza Vaccine Supply
International Task Force**

In recent years public health experts have focused on the impact of influenza, and an increasing number of countries have introduced influenza vaccines into their national immunization schedules^{1,2}. As a result, new insights are available into the burden imposed by the disease and the potential benefits offered by vaccination, which can help inform the development of future immunization policy.

Seasonal influenza is responsible for significant levels of sickness and death

Influenza circulates worldwide, affects people of all ages and can lead to severe illness and death in those at higher risk³. Quantifying the disease burden is complex, and hospitalization and death can result directly from influenza infection or complications linked with age, pregnancy or underlying diseases⁴. Much of the currently available evidence is from industrialized countries, although a growing body of information is emerging from developing nations^{1,5,6}.

- **Disease burden: influenza causes millions of cases of severe disease and death annually**

The World Health Organization (WHO) estimates influenza has a global annual attack rate of 5–10% in adults and 20–30% in children, and is responsible for 3–5 million cases of severe illness and 250,000–500,000 deaths annually^{3,5}. In 2003, at the 56th World Health Assembly it was noted that influenza could be responsible for up to one million fatalities each year⁷. In Europe, estimates suggest the virus may be responsible for between 40,000 and 220,000 deaths annually⁸. Data from the US show influenza has been associated with approximately 226,000 hospitalizations and 36,000 deaths annually⁴.

- **Disease burden: the elderly are at higher risk**

Several high risk groups, including the elderly, suffer more frequently from serious morbidity and mortality associated with influenza⁹. While estimates of the burden vary, a comparison of studies found influenza-related all-cause mortality rates of 116–168 per 100,000 person-years in those aged ≥ 65 years in Australia, Hong Kong, Singapore and the United States⁹. However, limited new data suggest the risk may be higher in low- and middle-income countries⁶: the comparison found rates were over three times higher in South Africa (545/100,000 person-years)⁹.

- **Disease burden: people with chronic conditions are at greater risk**

Those with underlying conditions, including cardiovascular, pulmonary and metabolic diseases (such as diabetes mellitus), renal dysfunction and immune-suppressing conditions are at greater risk from serious influenza-related illness and death⁵.

- **Disease burden: young children are at higher risk**

Children typically have the highest infection rates and act as an important source of transmission^{4,5}. Children aged < 2 years are at increased risk of serious illness and death, and hospitalization rates in this group are similar to the elderly^{4,5}. A recent review estimated there were 90 million cases of influenza in children aged < 5 years (in 2008), and 28,000–111,500 associated deaths¹⁰. The burden of influenza was greater in developing countries¹⁰.

- **Disease burden: pregnant women are at increased risk**

Studies indicate pregnancy increases the risk of greater disease severity and influenza-related complications^{4,5,6}.

Vaccination can help protect against the impact of influenza

WHO considers vaccination the most effective measure for preventing influenza and its severe outcomes³, and immunization is supported by many health authorities worldwide^{11,12}. While efficacy varies between groups, and much of the data relate to trivalent inactivated vaccines in industrialized countries, studies show they can prevent 70–90% of influenza illness in healthy adults when well matched to circulating strains^{3,4,5,8}. WHO considers these vaccines are 'in general very safe'⁵.

- **Benefits of vaccination: the elderly**

Estimates suggest vaccines can reduce severe illness and complications by as much as 60% in the elderly, and deaths by 80%, and during the influenza season can reduce hospitalizations by 50% in nursing home residents and by 25–39% in those not in nursing homes^{3,5}.

- **Benefits of vaccination: the chronically ill**

A number of studies have reported reductions in hospitalizations and deaths in those at higher risk for influenza complications⁴. A Thai study reported vaccination effectiveness of 76% in preventing influenza⁴. Another study found 36% effectiveness against hospitalizations, despite vaccines not matching circulating strains optimally⁴.

- **Benefits of vaccination: children and pregnant women**

Estimates of vaccine effectiveness in children vary, with higher efficacy seen in those who are older, and lower protection in those aged < 2 years^{4,5}. One study in children aged 6–24 months reported 66% efficacy against influenza illness, but found no substantial reduction the following year⁴. Evidence suggests immunization of children may help protect other groups in the community, such as the elderly^{4,5}. Results in pregnant women are varied, with one study in Bangladesh showing immunization may help protect mothers and their newborn infants⁴.

Conclusions

Seasonal influenza is a major burden on public health, and is responsible for substantial levels of sickness and death worldwide. The elderly, those with certain chronic conditions, young children and pregnant women are all at higher risk. Limited new data in the elderly and children suggest the burden may be higher in developing nations. Many countries use vaccines to help protect against the impact of influenza. Studies show vaccines can be highly effective at protecting healthy adults against influenza illness, can reduce the number of hospitalizations and deaths in the elderly and chronically ill, and may help protect young children, pregnant mothers and their newborn infants.

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About the IFPMA

IFPMA represents the research-based pharmaceutical companies and associations across the globe. The research-based pharmaceutical industry's 1.3 million employees research, develop and provide medicines and vaccines that improve the life of patients worldwide. Based in Geneva, IFPMA has official relations with the United Nations and contributes industry expertise to help the global health community find solutions that improve global health.

IFPMA manages global initiatives including: IFPMA Developing World Health Partnerships Directory studies and identifies trends for the research-based pharmaceutical industry's long-term partnership programs to improve health in developing countries, IFPMA Code of Practice sets standards for ethical promotion of medicines, IFPMA Clinical Trials Portal helps patients and health professionals find out about on-going clinical trials and trial results.

About the Influenza Vaccine Supply (IVS) Task Force

The IVS Task Force includes 16 vaccine manufacturing companies that are involved in research, development and production of influenza vaccines, representing more than 95% of world production. The IVS member companies are, Abbott, Adimmune Corporation, Baxter, Biken, CSL Limited, Crucell, Denka Seiken, GlaxoSmithKline Biologicals, Green Cross Corporation, Hualan Biologicals, Kaketsuken, Kitasato Institute, MedImmune, Novartis Vaccines & Diagnostics, Sanofi Pasteur, Sanofi Pasteur MSD, and Sinovac.



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