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[Lancet](#). 2005 Feb 26-Mar 4;365(9461):773-80.

Assessment of the efficacy and effectiveness of influenza vaccines in healthy children: systematic review.

[Jefferson T](#), [Smith S](#), [Demicheli V](#), [Harnden A](#), [Rivetti A](#), [Di Pietrantonj C](#).

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Comment in:

- [Lancet](#). 2005 Jun 18-24;365(9477):2086; author reply 2087.
- [Lancet](#). 2005 Jun 18-24;365(9477):2086-7; author reply 2087.

Abstract

BACKGROUND: We aimed to assess evidence of efficacy and effectiveness of live attenuated and inactivated influenza vaccines in children up to 16 years of age.

METHODS: We searched the Cochrane Library, MEDLINE, EMBASE Biological Abstracts, and Science Citation Index to June, 2004, in any language, and contacted vaccine manufacturers and authors of relevant studies to identify additional data. We included randomised, cohort, and case-control studies comparing efficacy of vaccines against influenza (reduction in laboratory-confirmed cases), effectiveness of vaccines against influenza-like illness (reduction in symptomatic cases), or both, with placebo or no intervention. We analysed the following outcomes: influenza, influenza-like illness, admissions, school absences, complications, and secondary transmission.

FINDINGS: We included 14 randomised controlled trials, eight cohort studies, one case-control study, and one randomised controlled trial of intraepidemic use of the vaccines. Live attenuated influenza vaccines had 79% efficacy and 38% effectiveness in children older than 2 years compared with placebo or no immunisation. Inactivated vaccines had lower efficacy (65%) than live attenuated vaccines, and in children aged 2 years or younger they had similar effects to placebo. Effectiveness of inactivated vaccines was about 28% in children older than 2 years. Vaccines were effective in reducing long school absences (relative risk 0.14 [95% CI 0.07-0.27]). Studies assessing the effects of vaccines against secondary cases, lower-respiratory tract disease, acute otitis media, and hospital stay suggested no difference with placebo or standard care, but lacked statistical power.

INTERPRETATION: Influenza vaccines (especially two-dose live attenuated vaccines) are efficacious in children older than 2 years. Efficacy and effectiveness of the vaccines differed strikingly. Only two small studies assessed the effects of influenza vaccines on hospital admissions and no studies assessed reductions in mortality, serious complications, and community transmission of influenza. If influenza immunisation in children is to be recommended as public-health policy, large-scale studies assessing such important outcomes and undertaking direct comparisons of vaccines are urgently needed.

PMID: 15733718 [PubMed - indexed for MEDLINE]

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