

# Vaccines for preventing influenza in healthy adults (Review)

Jefferson T, Di Pietrantonj C, Rivetti A, Bawazeer GA, Al-Ansary LA, Ferroni E



**THE COCHRANE  
COLLABORATION®**

This is a reprint of a Cochrane review, prepared and maintained by The Cochrane Collaboration and published in *The Cochrane Library* 2010, Issue 7

<http://www.thecochranelibrary.com>



[Intervention Review]

## Vaccines for preventing influenza in healthy adults

Tom Jefferson<sup>1</sup>, Carlo Di Pietrantonj<sup>2</sup>, Alessandro Rivetti<sup>2</sup>, Ghada A Bawazeer<sup>3</sup>, Lubna A Al-Ansary<sup>4</sup>, Eliana Ferroni<sup>5</sup>

<sup>1</sup>Vaccines Field, The Cochrane Collaboration, Roma, Italy. <sup>2</sup>Servizio Regionale di Riferimento per l'Epidemiologia, SSEpi-SeREMI - Cochrane Vaccines Field, Azienda Sanitaria Locale ASL AL, Alessandria, Italy. <sup>3</sup>Department of Clinical Pharmacy & KKUH, King Saud University, Riyadh, Saudi Arabia. <sup>4</sup>Department of Family & Community Medicine, Holder of "Shaikh Abdullah S. Bahamdan" Research Chair for Evidence-Based Health Care and Knowledge Translation, College of Medicine, King Saud University, Riyadh, Saudi Arabia. <sup>5</sup>Infectious Diseases Unit, Public Health Agency of Lazio Region, Rome, Italy

Contact address: Tom Jefferson, Vaccines Field, The Cochrane Collaboration, Via Adige 28a, Anguillara Sabazia, Roma, 00061, Italy. [jefferson.tom@gmail.com](mailto:jefferson.tom@gmail.com). [jefferson@assr.it](mailto:jefferson@assr.it).

**Editorial group:** Cochrane Acute Respiratory Infections Group.

**Publication status and date:** New search for studies and content updated (no change to conclusions), published in Issue 7, 2010.

**Review content assessed as up-to-date:** 2 June 2010.

**Citation:** Jefferson T, Di Pietrantonj C, Rivetti A, Bawazeer GA, Al-Ansary LA, Ferroni E. Vaccines for preventing influenza in healthy adults. *Cochrane Database of Systematic Reviews* 2010, Issue 7. Art. No.: CD001269. DOI: 10.1002/14651858.CD001269.pub4.

Copyright © 2010 The Cochrane Collaboration. Published by John Wiley & Sons, Ltd.

### ABSTRACT

#### Background

Different types of influenza vaccines are currently produced worldwide. Healthy adults are presently targeted mainly in North America.

#### Objectives

Identify, retrieve and assess all studies evaluating the effects of vaccines against influenza in healthy adults.

#### Search methods

We searched the Cochrane Central Register of Controlled Trials (CENTRAL) (*The Cochrane Library*, 2010, issue 2), MEDLINE (January 1966 to June 2010) and EMBASE (1990 to June 2010).

#### Selection criteria

Randomised controlled trials (RCTs) or quasi-RCTs comparing influenza vaccines with placebo or no intervention in naturally-occurring influenza in healthy individuals aged 16 to 65 years. We also included comparative studies assessing serious and rare harms.

#### Data collection and analysis

Two review authors independently assessed trial quality and extracted data.

#### Main results

We included 50 reports. Forty (59 sub-studies) were clinical trials of over 70,000 people. Eight were comparative non-RCTs and assessed serious harms. Two were reports of harms which could not be introduced in the data analysis. In the relatively uncommon circumstance of vaccine matching the viral circulating strain and high circulation, 4% of unvaccinated people versus 1% of vaccinated people developed influenza symptoms (risk difference (RD) 3%, 95% confidence interval (CI) 2% to 5%). The corresponding figures for poor vaccine matching were 2% and 1% (RD 1, 95% CI 0% to 3%). These differences were not likely to be due to chance. Vaccination had a modest effect on time off work and had no effect on hospital admissions or complication rates. Inactivated vaccines caused local harms and an estimated 1.6 additional cases of Guillain-Barré Syndrome per million vaccinations. The harms evidence base is limited.

---

**Vaccines for preventing influenza in healthy adults (Review)**

Copyright © 2010 The Cochrane Collaboration. Published by John Wiley & Sons, Ltd.

## **Authors' conclusions**

Influenza vaccines have a modest effect in reducing influenza symptoms and working days lost. There is no evidence that they affect complications, such as pneumonia, or transmission.

### **WARNING:**

This review includes 15 out of 36 trials funded by industry (four had no funding declaration). An earlier systematic review of 274 influenza vaccine studies published up to 2007 found industry funded studies were published in more prestigious journals and cited more than other studies independently from methodological quality and size. Studies funded from public sources were significantly less likely to report conclusions favorable to the vaccines. The review showed that reliable evidence on influenza vaccines is thin but there is evidence of widespread manipulation of conclusions and spurious notoriety of the studies. The content and conclusions of this review should be interpreted in light of this finding.

## **PLAIN LANGUAGE SUMMARY**

### **Vaccines to prevent influenza in healthy adults**

Over 200 viruses cause influenza and influenza-like illness which produce the same symptoms (fever, headache, aches and pains, cough and runny noses). Without laboratory tests, doctors cannot tell the two illnesses apart. Both last for days and rarely lead to death or serious illness. At best, vaccines might be effective against only influenza A and B, which represent about 10% of all circulating viruses. Each year, the World Health Organization recommends which viral strains should be included in vaccinations for the forthcoming season.

Authors of this review assessed all trials that compared vaccinated people with unvaccinated people. The combined results of these trials showed that under ideal conditions (vaccine completely matching circulating viral configuration) 33 healthy adults need to be vaccinated to avoid one set of influenza symptoms. In average conditions (partially matching vaccine) 100 people need to be vaccinated to avoid one set of influenza symptoms. Vaccine use did not affect the number of people hospitalised or working days lost but caused one case of Guillian-Barré syndrome (a major neurological condition leading to paralysis) for every one million vaccinations. Fifteen of the 36 trials were funded by vaccine companies and four had no funding declaration. Our results may be an optimistic estimate because company-sponsored influenza vaccines trials tend to produce results favorable to their products and some of the evidence comes from trials carried out in ideal viral circulation and matching conditions and because the harms evidence base is limited..