Summary points

Public policy worldwide recommends the use of inactivated influenza vaccines to prevent seasonal outbreaks

Because viral circulation and antigenic match vary each year and non-randomised studies predominate, systematic reviews of large datasets from several decades provide the best information on vaccine performance

Evidence from systematic reviews shows that inactivated vaccines have little or no effect on the effects measured

Most studies are of poor methodological quality and the impact of confounders is high

Little comparative evidence exists on the safety of these vaccines

Reasons for the current gap between policy and evidence are unclear, but given the huge resources involved, a re-evaluation should be urgently undertaken

registered influenza vaccines. A similar philosophy is the “we have to make decisions and cannot wait to have perfect data” approach. This attitude may have an altruistic basis but has two important consequences. Firstly, it uses up resources that could be invested in a proper evaluation of influenza vaccines or on other health interventions of proven effectiveness. Secondly, the inception of a vaccination campaign seems to preclude the assessment of a vaccine through placebo controlled randomised trials on ethical grounds. Far from being unethical, however, such trials are desperately needed and we should invest in them without delay. A further consequence is reliance on non-randomised studies once the campaign is under way. It is debatable whether these can contribute to our understanding of the effectiveness of vaccines. Ultimately non-randomised designs cannot answer questions on the effects of influenza vaccines.

The optimistic and confident tone of some predictions of viral circulation and of the impact of inactivated vaccines, which are at odds with the evidence, is striking. The reasons are probably complex and may involve “a messy blend of truth conflicts and conflicts of interest making it difficult to separate factual disputes from value disputes”²² or a manifestation of optimism bias (an unwarranted belief in the efficacy of interventions).²³

Whatever the reasons, it is a sobering thought that Archie Cochrane’s 1972 statement that we should use what has been tested and found to reach its objectives is as revolutionary now as it was then.

Contributor: TJ designed and wrote the paper and is the sole contributor and guarantor.

Competing interests: TJ owned shares in Glaxo SmithKline and received consultancy fees from Sanofi-Synthelabo (2002) and Roche (1997-9).

- Centers for Disease Control and Prevention. Prevention and control of influenza: recommendations of the Advisory Committee on Immunization Practices (ACIP). *Morbidity and Mortality Weekly Report* 2006;55:1-41.
- American Academy of Pediatrics Committee on Infectious Diseases. Recommendations for influenza immunization of children. *Pediatrics* 2004;113:1441-7.
- Orr P. An advisory committee statement (ACS). National Advisory Committee on Immunization (NACI). Statement on influenza vaccination for the 2004-2005 season. *Canadian Communicable Disease Report* 2004;30:1-32.
- Van Essen GA, Palache AM, Forleo E, Fedson DS. Influenza vaccination in 2000: recommendations and vaccine use in 50 developed and rapidly developing countries. *Vaccine* 2003;21:1780-5.
- World Health Organization. Influenza vaccines. WHO position paper. *Weekly Epidemiol Rec* 2002;77:230-40.
- Bueving HJ, van der Wouden JC, Berger MY, Thomas S. Incidence of influenza and associated illness in children aged 0-19 years: a systematic review. *Rev Med Virol* 2005;15:383-91.
- Beyer WE, de Bruijn IA, Palache AM, Westendorp RG, Osterhaus AD. Protection against influenza after annually repeated vaccination: a meta-analysis of serologic and field studies. *Arch Intern Med* 1999;159:182-8.
- Smith S, Demicheli V, Di Pietrantonj C, Harnden AR, Jefferson T, Matheson NJ, et al. Vaccines for preventing influenza in healthy children. *Cochrane Database Syst Rev* 2006;(1):CD004879.
- Demicheli V, Rivetti D, Deeks JJ, Jefferson TO. Vaccines for preventing influenza in healthy adults. *Cochrane Database Syst Rev* 2004;(3):CD001269.
- Thomas RE, Jefferson T, Demicheli V, Rivetti D. Influenza vaccination for healthcare workers who work with the elderly. *Cochrane Database Syst Rev* 2006;(3):CD005187.
- Rivetti D, Demicheli V, Di Pietrantonj C, Jefferson TO, Thomas R. Vaccines for preventing influenza in the elderly. *Cochrane Database Syst Rev* 2006;(3):CD004876.
- Cates CJ, Jefferson TO, Bara AL, Rowe BH. Vaccines for preventing influenza in people with asthma. *Cochrane Database Syst Rev* 2003;(4):CD000364.
- Poole PJ, Chacko E, Wood-Baker RWB, Cates CJ. Influenza vaccine for patients with chronic obstructive pulmonary disease. *Cochrane Database Syst Rev* 2006;(1):CD002733.
- Jefferson T, Rivetti D, Rivetti A, Rudin M, Di Pietrantonj C, Demicheli V. Efficacy and effectiveness of influenza vaccines in elderly people: a systematic review. *Lancet* 2005;366:1165-74.
- Simonsen L, Reichert TA, Viboud C, Blackwelder WC, Taylor RJ, Miller MA. Impact of influenza vaccination on seasonal mortality in the US elderly population. *Arch Intern Med* 2005;165:265-72.
- Simonsen L, Viboud C, Taylor R. Influenza vaccination in elderly people. *Lancet* 2005;366:2086.
- Hak E, Verheij TJ, Grobbee DE, Nichol KL, Hoes AW. Confounding by indication in non-experimental evaluation of vaccine effectiveness: the example of prevention of influenza complications. *J Epidemiol Community Health* 2002;56:951-5.
- Jordan R, Connock M, Albon E, Fry-Smith A, Olowokure B, Hawker J, et al. Universal vaccination of children against influenza: are there indirect benefits to the community? A systematic review of the evidence. *Vaccine* 2006;24:1047-62.
- Bhalla P, Tan A, Smyth R. Vaccines for preventing influenza in people with cystic fibrosis. *Cochrane Database Syst Rev* 2000;(1):CD001753.
- Harling R, Hayward A, Watson JM. Implications of the incidence of influenza-like illness in nursing homes for influenza chemoprophylaxis: descriptive study [see comments]. *BMJ* 2004;329:663-4.
- Carman WF, Wallace LA, Walker J. Rapid virological surveillance of community influenza infection in general practice. *BMJ* 2000;321:736-7.
- MacCoun RJ. Biases in the interpretation and use of research results. *Annu Rev Psychol* 1998;49:259-87.
- Chalmers I, Matthews R. What are the implications of optimism bias in clinical research? *Lancet* 2006;367:449-50.

(Accepted 21 September 2006)

doi 10.1136/bmj.38995.531701.80

Endpiece

Eating twice as much as is necessary

We may safely take it for granted after long deliberation, that almost every man, woman and child in this country [the United States], habitually eats and drinks twice as much every day, on a moderate estimate, as is necessary.

Annotation. *The Southern Review*. Charleston, SC: AE Miller, 1829;4:221

Submitted by Jeremy Hugh Baron, honorary professorial lecturer, Mount Sinai School of Medicine, New York

doi 10.1136/bmj.38924.463947.F7