Cost-effectiveness of influenza vaccination of people aged 50-64 years in Australia: results are inconclusive
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Record Status
This is a critical abstract of an economic evaluation that meets the criteria for inclusion on NHS EED. Each abstract contains a brief summary of the methods, the results and conclusions followed by a detailed critical assessment on the reliability of the study and the conclusions drawn.

CRD summary
The objective was to assess the cost-effectiveness of vaccination against influenza for everyone aged between 50 and 64 years, compared with the existing policy, in Australia, of vaccinating those over 65 years old. The authors concluded that there was great uncertainty in the cost-effectiveness of universal influenza vaccination and insufficient evidence to determine it; further research was needed. The methods were satisfactory and the results were well reported. The authors' conclusions appear to be appropriate.

Type of economic evaluation
Cost-effectiveness analysis, cost-utility analysis

Study objective
The objective was to assess the cost-effectiveness of vaccination against influenza for everyone aged between 50 and 64 years, compared with the existing policy of vaccinating those over 65 years old.

Interventions
Influenza vaccination for everyone aged 50 to 64 years was compared with vaccination for those aged over 65 years.

Location/setting
Australia/primary care.

Methods
Analytical approach:
A published decision-tree model was adapted to estimate the impact of vaccination. The authors stated that the perspective was that of the health care system, which included health costs borne by individuals, the government, and the private sector.

Effectiveness data:
The vaccine efficacy was from a published 2007 Cochrane review. The incidence of disease was primarily based on estimates from a published study. Other estimates, such as the proportion of high risk people, the complication rates, the mortality, and the vaccination uptake, were from Australian national databases and published studies.

Monetary benefit and utility valuations:
Averted influenza mortality was calculated, using burden of disease methods, which corrected for disability due to diseases other than influenza-like illness (ILI), as this was assumed to be of short duration.

Measure of benefit:
The primary benefit measure was disability-adjusted life-years (DALYs), which were discounted at an annual rate of 3%. The reduction in ILI cases, hospitalisations, and deaths, and the expected life-years were presented.

Cost data:
The cost categories were vaccine acquisition, general practitioner (GP) or nurse visits for vaccine administration, GP surgery and home visits for primary care, and hospitalisation. These data came from national databases, including the Pharmaceutical Benefits Scheme, National Immunisation Program, Medicare Benefit Schedule, Australian Institute of...
Health and Welfare, and National Hospital Cost Data Collection. All costs were reported in Australian dollars (AUD) and the price year was 2003.

Analysis of uncertainty:
One-way sensitivity analyses were conducted on the key model inputs, including the incidence of ILI, vaccine uptake, vaccine efficacy, and discount rate.

Results
Vaccination of 50- to 64-year-olds, led to 1.7 million people being vaccinated, an 8.9% decrease in ILI incidence, and a 51% decrease in deaths. There were 54,454 ILI cases, which resulted in 28 deaths, 1,203 life-years lost, and 755 DALYs lost. With the existing policy of vaccination for those over 65 years old, there were 59,604 ILI cases, which resulted in 59 deaths, 583 life-years lost, and 366 DALYs lost.

The total costs were AUD 70,653,285 for vaccination of those aged 50 to 64 years, and AUD 27,283,305 for vaccination of those aged over 65 years. The incremental cost-utility ratio of younger vaccination was AUD 111,574 per DALY averted.

The sensitivity analysis indicated that the results were sensitive to the variations in most of the model inputs. The incremental cost per DALY averted, with younger vaccination, ranged from AUD 6,000 to AUD 135,000.

Authors’ conclusions
The authors concluded that there was great uncertainty in the cost-effectiveness of universal influenza vaccination, for those aged 50 to 64 years, and insufficient evidence to determine it. They suggested that further research was needed to reduce the uncertainty around influenza and ILI incidence in Australia.

CRD commentary
Interventions:
The comparator was the existing vaccination policy in the authors’ setting. This is likely to have been a relevant comparator in other settings.

Effectiveness/benefits:
It was unclear whether a review of the literature was undertaken to identify the best available evidence, but vaccine efficacy was from a published systematic review, which appears to have been appropriate. Most of the epidemiological evidence came from national databases, which were relevant to the Australian setting. A number of benefit measures were used and these might be relevant to decision makers. Future DALYs and life-years were appropriately discounted. Further information on the data sources, model parameter assumptions, etc. was available upon request from the authors.

Costs:
The costs appear to have reflected the perspective stated and were reported clearly. A breakdown of the cost categories was not given and the costs and resource use were not reported separately, except for the vaccine. This reduces the transparency of the analysis, but the data were from Australia sources, which reflected the health care system, and were well reported. The price year was reported, which will facilitate reflation exercises. The costs were accrued over the first 12 months and were appropriately left undiscounted.

Analysis and results:
The time horizon for the analysis was not explicitly stated, but the costs were incurred in the first year only, while the benefits were accrued over a number of years. The synthesis of the costs and benefits was appropriately performed and presented. The uncertainty was partly investigated in a deterministic sensitivity analysis, which was clearly reported and discussed. The authors provided an explanation for not undertaking a probabilistic sensitivity analysis. They compared their results with those of another Australian study and suggested that the considerable uncertainty in their findings was the reason for the different conclusions.

Concluding remarks:
The methods were satisfactory and the results were well reported. The authors’ conclusions appear to be appropriate.

**Funding**
Not stated.

**Bibliographic details**

**PubMedID**
21463417

**DOI**
10.1111/j.1753-6405.2010.00639.x

**Original Paper URL**

**Indexing Status**
Subject indexing assigned by NLM

**MeSH**
Age Factors; Australia /epidemiology; Cost-Benefit Analysis; Decision Support Techniques; Female; Health Care Costs; Health Policy; Humans; Immunization Programs /economics; Influenza Vaccines /administration & dosage /economics; Influenza, Human /economics /epidemiology /prevention & control; Male; Middle Aged; Models, Econometric; Quality-Adjusted Life Years; Sensitivity and Specificity; Vaccination /economics

**AccessionNumber**
22011001316

**Date bibliographic record published**
31/08/2011

**Date abstract record published**
27/01/2012