The cost-effectiveness of a universal influenza vaccination program for adults aged 50-64 years in Australia

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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 study assessed the cost-effectiveness of a universal immunisation programme against influenza in people aged 50 to 64 years, compared with the current vaccination programme in Australia (universal vaccination only for those aged 65 years or older). The authors concluded that the vaccination policy for people aged 50 to 64 years was highly cost-effective in the Australian setting and should be part of the National Immunisation Program. The study methodology was robust in terms of both the reporting and presentation of the data and results. The authors’ conclusions appear valid.

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

Study objective
The primary objective of the study was to examine the cost-effectiveness of a universal immunisation programme against influenza in people aged 50 to 64 years, compared with the current vaccination programme in Australia. The current programme was universal vaccination only for those aged 65 and older.

Interventions
The study examined a national programme of universal influenza vaccination in people aged 50 to 64 years. This intervention was compared against the current strategy in which the Australian government only recommends and funds influenza vaccine for those aged at least 65 years and indigenous people aged at least 50 years.

Location/setting
Australia/primary care.

Methods
Analytical approach:
A published decision model on the natural history of influenza was adapted to reflect the Australian setting and to estimate the impact of the vaccination programme. The time horizon of the analysis was 1 year. The authors stated that the perspectives of the analysis were that of the health care payer (including also patient co-payments), that of the government (including only direct costs to Australian governments at federal and state levels), and that of society (which also included lost production costs).

Effectiveness data:
The clinical data used to populate the decision model were presumably derived from a selection of known, relevant studies. The vaccine effectiveness data were retrieved from a published review of influenza vaccines in healthy adults. Other estimates on incidence of disease, proportion of high-risk people, mortality rates and vaccination uptake were mainly derived from national databases. Vaccine uptake under the new policy was based on expert opinion and assumptions. Most of the information on primary sources of clinical data was presented in a companion paper.

Monetary benefit and utility valuations:
Utility valuations were derived from an Australian study (details not give). However, the authors stated that a conservative approach was taken by not applying lower utility weights to the period of illness that individuals may experience for influenza-like illness (ILI) and its complications. Thus, it seems that the utility weights were only related to age groups.
Measure of benefit:
The key summary benefit measure used in the economic evaluation was the expected number of quality-adjusted life-years (QALYs). These were estimated using the decision model. An annual discount rate of 5% was applied to benefits accrued after the first year. The reduction in ILI cases, hospitalisations, deaths and work-days, as well as the expected life-years (LYs), were also presented and were combined with the costs.

Cost data:
The health service costs included in the analysis were vaccine (acquisition), general practitioner (GP) visits for vaccine administration, hospitalisations, emergency department visits, prescriptions and diagnostic tests, and lost productivity costs. With the exception of a few items, the unit costs and the quantities of resources used were not presented separately. The cost of the vaccine reflected the price negotiated by the health authority. The cost of a GP visit was derived from a database of GP activity. Hospital-related costs were obtained using Australian Refined Diagnosis Related Group supplied by the Australian Institute of Health and Welfare. Other health care costs were obtained from the Medicare Benefits Scheme. The costs of lost productivity were valued using the human capital approach and data from the Australian Bureau of Statistics. Data on absenteeism for influenza cases were obtained from a published French study. Other resource use data were derived from published studies. The costs were in Australian dollars (AUD). The price year was 2005.

Analysis of uncertainty:
The authors undertook a univariate sensitivity analysis on model parameters that they considered likely to be influential. Some specific items, such as the costs of the national campaign or costs of vaccine leakage, were further investigated in the sensitivity analysis. A probabilistic sensitivity analysis was also performed by assigning probabilistic distributions to model inputs. Details of these simulations were given, and cost-effectiveness acceptability curves were presented.

Results
At a national level, the new vaccination programme would reduce the annual number of ILI cases by 3,124 (a 0.09% reduction in the incidence of ILI, from 1.90 to 1.81%), and prevent 1,172 hospitalisations, 89 deaths and 2,805 work-days lost. At an individual level, the expected QALYs were 11.8254 with universal vaccination and 11.8251 with the current vaccination programme.

From the perspective of the health care payer, the total costs per individual were AUD 19.29 with vaccination and AUD 16.61 with no vaccination. The corresponding values from the perspective of the government were AUD 18.55 and AUD 11.83.

The cost per QALY gained with vaccination over no vaccination was AUD 8,908 from the perspective of the health care payer, AUD 8,338 from the perspective of society, and AUD 22,408 from the perspective of the government.

The deterministic sensitivity analysis indicated that the incremental cost per QALY gained with vaccination did not exceed the value of AUD 18,000 from the perspective of the health care payer (AUD 50,000 from the perspective of the government) in any scenario, except when considering variations in the probability of death due to influenza.

The probabilistic sensitivity analysis confirmed that vaccination remained below the threshold of AUD 50,000 per QALY in 99% of the simulations.

Authors' conclusions
The authors concluded that a vaccination policy for people aged 50 to 64 years was highly cost-effective in the Australian setting and should be part of the National Immunisation Program.

CRD commentary
Interventions:
The selection of the comparator (i.e. no universal vaccination) was appropriate in that it reflected the current pattern of care in Australia. It is also likely to represent a relevant comparator in other settings.
Effectiveness/benefits:
The authors appear to have directly selected the sources used to derive the clinical estimates. It was not stated whether a review of the literature was undertaken. Most of the epidemiological evidence came from national databases, which were relevant to the Australian setting. Vaccine effectiveness was based on a published review study, which appears an appropriate approach. A number of benefit measures were used in the analysis. Clearly, QALYs were the main measure since they are comparable with the benefits of other health care interventions. Nevertheless, other health care benefits might be relevant to decision-makers.

Costs:
The analysis of the costs was undertaken from three different perspectives, the cost items relevant to each being reported. A breakdown of the cost categories was given, but the resource quantities and unit costs were presented only for selected items. The process of identifying cost categories, together with the selection of key sources of data, was clear. The costs reflected the typical health system in the Australian setting. The price year was reported, which will facilitate inflation exercises in other time periods.

Analysis and results:
The synthesis of the costs and benefits was appropriately performed and presented. Similarly, the results of the sensitivity analysis were reported clearly and discussed. The issue of uncertainty was satisfactorily addressed by means of both deterministic and probabilistic sensitivity analyses. Furthermore, the authors stated that, when uncertain estimates were found in the literature, conservative assumptions were made in order to bias the model against the vaccination strategy. The issue of generalisability of the current findings to other settings was not explicitly addressed, although the results from studies performed in other health care systems were discussed.

Concluding remarks:
The study methodology appears robust in terms of the reporting of data used in the model and the presentation of results. The authors’ conclusions appear valid.

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Bibliographic details

Other publications of related interest


Indexing Status
Subject indexing assigned by NLM

MeSH
Australia; Cost-Benefit Analysis; Humans; Immunization Programs; Influenza Vaccines; Influenza, Human /economics