An incremental economic evaluation of targeted and universal influenza vaccination in pregnant women

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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 targeted and universal vaccination against influenza in pregnant women. The authors concluded that targeted vaccination of women with at least one comorbidity could be economically dominant but a strategy of universal vaccination provided value for money compared with targeted vaccination (especially if delivered as part of a routine pre-natal visit). The study used valid cost-effectiveness methodology that reported all model assumptions clearly. The authors’ conclusions appear robust.

Type of economic evaluation
Cost-utility analysis

Study objective
The study assessed the cost-effectiveness of targeted and universal vaccination against influenza in pregnant women.

Interventions
Two vaccination strategies were considered: targeted vaccination of pregnant women with one or more comorbidities and universal vaccination of all pregnant women. Vaccination was delivered by a family practitioner. The comparator was no vaccination.

Location/setting
Canada/primary care.

Methods
Analytical approach:
The analysis was based on a decision tree model with a one-year time horizon. The perspective was that of the health system payer.

Effectiveness data:
Clinical inputs for non-vaccinated women were derived from an administrative database in Nova Scotia of 134,188 pregnant women over the period 1990 to 2003. A randomised controlled trial was used to estimate the efficacy of vaccination on pregnant women. The main endpoints were event rates defined as the number of physician visits or hospital admissions for an influenza-related diagnosis.

Monetary benefit and utility valuations:
Utility valuations were based on published sources supplemented with an authors’ assumption regarding the quality of life associated with the Guillain-Barré syndrome.

Measure of benefit:
Quality-adjusted life-years (QALYs) were used as the summary benefit measure.

Cost data:
The economic analysis included costs of vaccination, family practitioner delivery, influenza-related physician utilisation, hospital services and treatment of Guillain-Barré syndrome. These costs were derived from official sources such as Nova Scotia Department of Health and Wellness, Nova Scotia physician utilisation database and Ontario Case
Cost Initiative database. The annual cost of Guillain-Barré syndrome was taken from a USA study. Costs were in Canadian dollars ($). The price year was 2010.

Analysis of uncertainty:
An alternative scenario considered the vaccination strategies being delivered in a public health clinic or delivered with an additional family practitioner visit. One-way sensitivity analyses and threshold analyses were carried out on selected inputs using published and assumed ranges of values.

Results
In the whole cohort, expected one-year costs and QALYs were $344,878 and 9,492.23 with no vaccination, $335,392 and 9,492.55 with targeted vaccination and $426,536 and 9,494.83 with universal vaccination.

Incremental analysis revealed that targeted vaccination dominated no vaccination (no vaccination was less effective and more expensive). The incremental cost per QALY gained with universal vaccination over targeted vaccination was $39,942.

When vaccination was delivered by a public health clinic, targeted vaccination remained dominant over no vaccination and universal vaccination was highly cost-effective over targeted vaccination. The need for an additional visit would make the two vaccination strategies no longer cost-effective. In the other sensitivity analyses, base case findings held.

Authors’ conclusions
The authors concluded that targeted vaccination of women with at least one comorbidity could be economically dominant but a strategy of universal vaccination provided value for money compared with targeted vaccination (especially if delivered as part of a routine pre-natal visit).

CRD commentary
Interventions:
Selection of the comparators was appropriate as the two possible vaccination strategies were compared against no vaccination, which might represent the conventional pattern of care in several settings.

Effectiveness/benefits:
Baseline event rates were taken from a large population-based study which was representative of Canadian pregnant women. The authors stated that a small percentage of these women were vaccinated and real event rates for unvaccinated women might have been slightly higher. This would go against the vaccination strategy. Vaccine efficacy was taken from the only randomised trial available for this population. Extensive sensitivity analysis was conducted on model parameters. The authors pointed out the appropriateness of using QALYs given the impact of the disease on patients’ health. Published estimates of utility weights were used for most conditions, but methodological details of these sources were not given.

Costs:
Overall, the economic analysis was performed satisfactorily. The cost categories and the sources used were consistent with the perspective adopted in the study. Local sources were used for most costs. Resource use was taken from a large population-based study that represented a strength of the analysis. The price year was reported, which facilitated reflation exercises in other time periods. Unit costs were reported for most items. Economic inputs were analysed using the probabilistic approach to consider the variability around these estimates. The impact of variations in individual inputs was tested in a deterministic sensitivity analysis.

Analysis and results:
The study results were presented extensively. Costs and benefits were combined using an incremental approach that enabled identification of the optimal strategy. A conventional cost-effectiveness threshold of $50,000 per QALY was adopted. Methodologically appropriate approaches were used to deal with the issue of uncertainty. The results of the sensitivity analyses were clearly reported. The authors compared their results with those of other published studies that showed similar findings. The issue of the transferability of study results was not addressed explicitly, but the study findings might be relevant for countries with similar prices and epidemiological characteristics.
Concluding remarks:
The study used valid cost-effectiveness methodology that reported all model assumptions clearly. The authors’ conclusions appear robust.

Bibliographic details

PubMedID
22164556

Original Paper URL

Indexing Status
Subject indexing assigned by NLM

MeSH
Comorbidity; Cost-Benefit Analysis; Female; Humans; Influenza Vaccines /administration & dosage /economics; Influenza, Human /economics /immunology /prevention & control; Models, Economic; Nova Scotia; Pregnancy; Pregnancy Complications, Infectious /economics /immunology /prevention & control; Pregnant Women; Quality-Adjusted Life Years

AccessionNumber
22012002798

Date bibliographic record published
10/03/2012

Date abstract record published
20/07/2012