The efficacy and cost-effectiveness of vaccination against influenza among elderly persons living in the community

Nichol K L, Margolis K L, Wuorenma R N, Von Sternberg T

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.

Health technology
Vaccination against influenza

Type of intervention
Primary prevention

Economic study type
Cost-effectiveness analysis

Study population
All persons aged 65 or over, enrolled in a Health Maintenance Organisation (HMO).

Setting
The practice setting was primary care. The economic study was carried out in Minneapolis, USA.

Dates to which data relate

Source of effectiveness data
Single study

Link between effectiveness and cost data
Cost data related to the same patient sample as used in the effectiveness study. Data were collected prospectively.

Study sample
The study sample included 25,532 elderly persons (of which 45% and 55% in the intervention and comparator groups respectively) in the study cohort in 1990-91; 26,369 (of which 58% in intervention group and 42% in comparator group) in 1991-92; and 26,626 (of which 55% in intervention group and 45% in comparator group) in 1992-93. The authors justified the choice of patient sample on the grounds that a cohort of 25,000 would give an 85% chance of detecting outcome events among vaccine recipients.

Study design
Serial cohort study. The study was based on multiple centre locations: 23 clinics. Each study period included both the vaccination season and the subsequent influenza season. There was no loss to follow-up.
Analysis of effectiveness
Results were based on intention-to-treat analysis. The outcomes studied included hospitalisation for pneumonia and influenza, for all acute and chronic respiratory conditions and for congestive heart failure and mortality rate from all conditions. Vaccine recipients had more coexisting illnesses at baseline than those who did not receive the vaccine. However, an adjustment for risk factors was allowed.

Effectiveness results
During each influenza season vaccination was associated with a reduction in the rate of hospitalisation for pneumonia by 48% to 57% (p <= 0.002) and for all acute and chronic respiratory conditions by 27% to 39% (p <= 0.01). Vaccination was also associated with a 37% reduction (p = 0.04) in the rate of hospitalisation for congestive heart failure during the 1991-92 season when influenza was epidemic. In the three seasons, vaccination was associated with significant decreases of 39% to 54% in mortality from all causes (p<0.001).

Clinical conclusions
Among elderly people living in the community, vaccination against influenza was associated with less frequent hospitalisations for complications of influenza and with fewer deaths during the influenza season.

Measure of benefits used in the economic analysis
The economic benefit measure used was reductions in deaths from influenza and its complications.

Direct costs
Only health service costs were considered. The costs of hospitalisation for pneumonia and influenza, all acute and chronic respiratory conditions, and congestive heart failure were included in the analysis. Costs reflected actual charges for hospitalised enrollees.

The cost of vaccination included all costs of vaccine, supplies, advertising and mailings, personnel to administer the vaccine and miscellaneous administrative expenses. Costs were not discounted. Price date was not given.

Currency
US dollars

Sensitivity analysis
No sensitivity analysis was performed

Estimated benefits used in the economic analysis
Vaccination was associated with significant decreases of 39% to 54% in mortality from all causes (p<0.001).

Cost results
After subtracting the mean costs of the programme, the savings in the costs of hospitalisation for influenza complications were $114 (in 1990-91) and $235 (1991-1992) per person vaccinated. During 1991-92 the range of hospitalisation cost reduction was 47% to 66% (p< 0.005).

Synthesis of costs and benefits
The synthesis of costs and benefits was not relevant since incremental benefits were positive and incremental costs were negative.
Authors' conclusions
The authors concluded that for elderly citizens living in the community, vaccination against influenza was associated with reductions in the rate of hospitalisation and in deaths from influenza and its complications. Vaccination produced on average dollar savings of $117 per person vaccinated, with cumulative savings of nearly $5 million.

CRD Commentary
Sensitivity analysis to test the robustness of the model would have been useful. Costs have not been discounted to baseline period.

Implications of the study
This was a well conducted study and health care programmes should consider the potential net benefits due to elderly vaccination.

Source of funding
Part grant from Connaught Laboratories

Bibliographic details

PubMedID
8065407

DOI
10.1056/NEJM199409223311206

Original Paper URL

Indexing Status
Subject indexing assigned by NLM

MeSH
Acute Disease; Aged; Chronic Disease; Cohort Studies; Cost-Benefit Analysis; Female; Heart Failure /etiology /mortality; Hospitalization /statistics & numerical data; Humans; Influenza Vaccines; Influenza, Human /complications /mortality /prevention & control; Male; Pneumonia, Viral /etiology /mortality; Respiratory Tract Infections /economics /etiology /mortality; Treatment Outcome; Vaccination /economics /statistics & numerical data

AccessionNumber
21995007055

Date bibliographic record published
27/06/1995

Date abstract record published
27/06/1995