Cost utility of public clinics to increase pneumococcal vaccines in the elderly

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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.

Health technology
The administration of pneumococcal polysaccharide vaccines (PPV) to people aged at least 65 years in non-traditional settings, such as community clinics (Community Clinics Program, CCP).

Type of intervention
Vaccination.

Economic study type
Cost-utility analysis.

Study population
The study population comprised the general population of individuals aged 65 years or over.

Setting
The setting was community clinics that were set up specifically to provide influenza and pneumococcal vaccinations. The economic study was carried out in Monroe Country (Rochester), New York, USA.

Dates to which data relate
The effectiveness evidence referred to studies published in 1997 and 2000. The resource use and cost data were gathered in 1998 and from the previously mentioned studies. The price year was 1998.

Source of effectiveness data
The effectiveness data were obtained from two published studies.

Outcomes assessed in the review
The outcomes assessed from the published studies were the quality-adjusted life-years (QALYs) gained with no vaccination and with vaccination in a physician's office and with the PPV programme.

Study designs and other criteria for inclusion in the review
Not stated.

Sources searched to identify primary studies
Not stated.
Criteria used to ensure the validity of primary studies
Not stated.

Methods used to judge relevance and validity, and for extracting data
Not stated.

Number of primary studies included
The effectiveness evidence was obtained from two primary studies, conducted by the same authors.

Methods of combining primary studies
Irrelevant.

Investigation of differences between primary studies
Irrelevant.

Results of the review
The QALYs gained were 6.35623 with no vaccination, and 6.35865 for both vaccination in a physician's office and with the PPV programme. Consequently, the incremental gain in QALYs due to the vaccination programme (regardless of location) was 0.00242.

Methods used to derive estimates of effectiveness
The authors made some assumptions to support the cost-utility analysis.

Estimates of effectiveness and key assumptions
The authors assumed that all immunisations provided in the CCP would not have occurred in the absence of the programme. It was also assumed that the benefits of vaccination were the same irrespective of location. Finally, no extra QALYs were associated with inappropriate vaccination (patients who had already received the PPV). The rate of inappropriate vaccinations was 27%.

Measure of benefits used in the economic analysis
The benefit measure used in the economic analysis was the number of QALYs gained with the intervention. It was derived from the effectiveness analysis.

Direct costs
The economic analysis assessed community programme costs (planning, clinical activities, and post-clinic), vaccine costs, and the expected cost of health sequelae per person immunised. The vaccine costs were calculated from the number of appropriate and inappropriate vaccines given. These costs were based on actual data derived from the Monroe Country Department of Health (1998), as were the community programme costs. The cost of health sequelae per person immunised was derived from two studies published in 1997 and 2000. A 3% discount rate was used only for those costs reported in the primary studies that provided the cost data. The unit costs were only reported for staff time. The quantities of resources were given only for the number of vaccines administered. It was assumed that unnecessary vaccination did not result in extra costs.

As the CCP offered both pneumococcal and influenza immunisation, most of the costs were incurred in activities common to both interventions. Thus, the cost analysis was carried out from two points of views, PPV jointly produced with the influenza programme and PPV incremental to the influenza programme (when only the costs directly
attributable to the PPV were considered). The cost/resource boundary of the study was that of the health care system. All costs were inflated to 1998 using the medical care component of the consumer price index.

**Statistical analysis of costs**
The costs were treated deterministically in the base-case.

**Indirect Costs**
The indirect costs were not included in the analysis.

**Currency**
US dollars ($).

**Sensitivity analysis**
Several alternative scenarios were identified to assess the robustness of the base-case estimates. In the first scenario, the percentage of inappropriate vaccines was varied (20% or 40%). In the second scenario, the costs were higher and the number of QALYs lower. In the third scenario, it was assumed that the cost of volunteers was zero. Finally, in the fourth scenario, the planning and advertising costs were considered fixed, thus the overall costs decreased over time. Threshold analyses to assess under which conditions the PPV may be cost-saving were also performed.

**Estimated benefits used in the economic analysis**
See the 'Effectiveness Results' section.

**Cost results**
The total costs were $78.02 with no vaccination, $75.15 with vaccination in a physician's office, $98.95 with PPV incremental to the influenza programme, and $108.55 with PPV jointly produced with the influenza programme. The incremental costs of vaccination over no vaccination were -$2.87 for vaccination in a physician's office, $20.93 for PPV incremental to the influenza programme, and $30.53 for PPV jointly produced with the influenza programme.

**Synthesis of costs and benefits**
An incremental cost-utility analysis was performed to combine the costs and benefits of the interventions. The vaccination administered in the physician's office was dominant over no vaccination, being associated with more QALYs and lower costs. The incremental cost per QALY gained was $8,647 with PPV incremental to the influenza programme, and $12,617 with PPV jointly produced with the influenza programme. The sensitivity analyses showed that in no instance was CCP cost-saving, although in most scenarios, the incremental cost per QALY gained decreased. The threshold analysis showed that the conditions that may lead to the CCP being cost-saving were quite unlikely.

**Authors' conclusions**
The cost-utility ratio of the Community Clinics Program (CCP) over no vaccination was within the range of ratios of other accepted medical interventions. Consequently, the vaccination programme conducted in non-traditional settings, such as the CCP, represented a viable strategy for improving pneumococcal immunisation rates among the elderly.

**CRD COMMENTARY - Selection of comparators**
The rationale for the comparators was clear. No vaccination was selected as it represented the situation for over 50% of the individuals aged 65 years or more. Vaccination administered in a physician's office was chosen as it represented the routine location for PPV. You should decide whether they represent widely used interventions in your own setting.
Validity of estimate of measure of effectiveness
The effectiveness measures estimated were the QALYs (see next field for comments).

Validity of estimate of measure of benefit
The benefit measure used in the economic analysis was the QALY, which was derived directly from two published studies. However, it was not stated whether the literature was systematically searched and reviewed. In addition, there was little information on the source of the estimates, and only two studies were used. A different source of data on QALYs was used in the sensitivity analyses, which were also used to test the assumptions made in the analysis. The use of QALYs as benefit measures allows comparisons to be made with the benefits of other interventions.

Validity of estimate of costs
The cost analysis was carried out from the perspective of the health care system, and it appears that all the categories of costs were included. A detailed breakdown of the costs was reported, but the unit costs were only given for staff time. The source of the cost data was reported and sensitivity analyses were performed, although the costs were treated deterministically in the base-case analysis. The price year was appropriately indicated. Discounting was performed, as suggested in the primary study that provided the cost data, although the time horizon of the analysis was unclear. The indirect costs were not included but may have been relevant.

Other issues
The authors compared the estimated cost-utility ratio with those from other similar interventions implemented in the health care system. The issue of the generalisability of the study results was not explicitly addressed. However, several sensitivity analyses were performed, thus enhancing the external validity of the analysis. The study referred to the general population of elderly and this was reflected in the conclusions. The authors presented their results in detail.

Implications of the study
The main implication of the study was that CCP was effective in increasing pneumococcal immunisation rates among elderly at an acceptable cost for the health care system. Future research should focus on other strategies for improving immunisation rates, such as community-wide publicity campaigns or academic detailing programmes to increase physicians’ awareness of the recommendations for pneumococcal immunisation.

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