Cost-effectiveness of vaccination against herpes zoster in adults aged over 60 years in Belgium

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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 global and targeted vaccination against herpes zoster (shingles) in adults aged over 60 years in Belgium. The authors concluded that, under a scenario least in favour of vaccination with a 50% reduction in vaccine price per dose, vaccinating people aged 60 to 64 years would be cost-effective at a threshold under EUR 30,000. The methodology of the study was appropriate, with clear and transparent reporting. The authors’ conclusions are appropriate.

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

Study objective
The study assessed the cost-effectiveness of vaccination against herpes zoster (shingles) in adults aged over 60 years in Belgium.

Interventions
Global vaccination and age-targeted vaccination with herpes zoster were compared with no vaccination.

Location/setting
Primary care/Belgium

Methods
Analytical approach:
A state-transition model was developed to simulate the number of shingles episodes, with and without vaccination, for a defined cohort. The analysis was conducted over a lifetime. The authors stated that a health care payer perspective was adopted.

Effectiveness data:
A range of clinical data was modelled including herpes zoster incidence, vaccination coverage, and vaccination efficacy. Incidence data were taken from a national database. Coverage was assumed to be similar to influenza and pneumococcal vaccines in the same target population. Vaccine efficacy came from the Shingles Prevention Trial (the only trial that measured efficiency of the vaccine in preventing shingles). Estimated mean values as a function of age or severity of illness score were obtained using statistical methods. Extensive scenario analyses were undertaken to predict least and most favourable results for vaccination in the vaccine model; these were used to obtain the cost-effectiveness results. The burden of illness was estimated using the average severity of illness score for shingles, which were obtained from a retrospective Belgium hospital population. The main effectiveness estimate was the efficacy of the vaccine and the uncertainty regarding the efficacy of the vaccine.

Monetary benefit and utility valuations:
The source of utility valuation was a prospective study based in a community setting in the UK and estimated using the EQ-5D. These data were used to estimate the utility lost due to a herpes zoster episode as a function of severity of illness score.

Measure of benefit:
The measure of benefit was quality-adjusted life-years (QALYs). A cost per life-year gained and cost per QALY were presented. QALYs were discounted at a rate of 1.5% per year, according to Belgium guidelines.

Cost data:
The costs included those for obtaining and administering the vaccine and those for treating shingles. The vaccination costs were based on an estimate of a bulk purchase price from an initial reported price per dose of Zostavax vaccine from the Centres for Disease Control and Prevention. The cost of administering the vaccine was set to a fixed price. The cost of treating shingles came from published survey data from Belgium. The costs were presented in Euros (EUR). Discounting was performed at a rate of 3% per year, according to Belgium guidelines.

Analysis of uncertainty:
Univariate, multivariate and numerous scenario analyses were performed to assess the impact on the results of a wide range of uncertainty in the key parameters.

Results
Results were presented across four age cohorts (60, 70, 80 and 85 years) for the least favourable and most favourable to vaccine scenarios. A summary of the results are presented in this abstract.

The total vaccine cost across both scenarios (least in favour and most in favour of vaccination) ranged from EUR 3,697,485 for vaccination at 60 years old to EUR 818,296 for vaccination at 85 years.

For the scenario most in favour of vaccination, the incremental discounted cost of vaccination at 60 years old was EURO 1,759,838 and the incremental discounted QALYs were 1406, whilst at 85 years, the incremental discounted cost of vaccination was EUR 619,514 and the incremental discounted QALYs were 113.

For the scenario least in favour of vaccination, the incremental discounted costs of vaccination at 60 years old was EUR 3,505,428 and the incremental discounted QALYs were 72, whilst at 85 years, the incremental discounted costs of vaccination was EUR 809,239 and the incremental discounted QALYs were 3.

For the scenario most in favour of vaccination, the incremental cost-effectiveness ratios (ICER) ranged from EUR 1,251 per QALY at 60 years to EUR 5,498 per QALY at 85 years.

For the scenario least in favour of vaccination, the ICERs ranged from EUR 48,978 per QALY at 60 years to EUR 303,705 per QALY at 85 years.

Authors' conclusions
The authors concluded that, under a scenario least in favour of vaccination with a 50% reduction in vaccine price per dose (from EUR 90 down to EUR 45), vaccinating people aged 60 to 64 years would be cost-effective at a threshold of under EUR 30,000.

CRD commentary
Interventions:
The level of reporting of the intervention and the scenarios considered was good. It appeared that the interventions and comparator included were relevant to the study setting of Belgium and for wider settings.

Effectiveness/benefits:
The identification of the data was not described in detail, so it was not possible to make any judgement about their validity. However, the authors appear to have made attempts to use the most relevant data and have thoroughly characterised the uncertainty present in that data. The level of reporting of the main clinical trial was limited, but the methods used to incorporate published data into the economic model was thorough. The source of utility data and the calculation of QALYs for the derivation of the benefit measure was clearly reported. Whilst sources of data were sparingly reported, the methods with which they were evaluated, characterised and incorporated into the model were well presented and appropriate.

Costs:
The cost data came from sources which appeared to be highly relevant to the study setting. The cost year was not explicitly stated by the authors. As with the effectiveness data, limited information surrounding sources were presented, with the analysis focusing on the methods used to incorporate the data into the model.

Analysis and results:
The modelling and the methods to obtain estimates to populate the model were well reported; these were well presented and fully discussed. The use of an incremental analysis was appropriate to explore the relative cost-effectiveness of vaccination across a range of groups and scenarios; the results of these analyses were well presented and discussed. The impact of uncertainty was thoroughly considered, reported, and built into the study design. The authors considered data and model limitations in detail.

Concluding remarks:
The methodology of the study was appropriate, with clear and transparent reporting. The authors' conclusions are appropriate.

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