Cost-effectiveness of supplementary immunization for measles in India

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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
This study evaluated the cost-effectiveness of a supplementary immunisation activity for measles compared with a standard single-dose vaccine programme for children in districts of India with low vaccination coverage. The author concluded that the supplementary immunisation activity was cost-effective in reducing mortality and morbidity from measles. The methods and reporting were mostly satisfactory, but the selection and details of the clinical and economic data sources were not described, which means that the results should be considered with caution.

Type of economic evaluation
Cost-effectiveness analysis

Study objective
The aim was to estimate the cost-effectiveness of a supplementary immunisation activity against measles for children in districts of India with low vaccination coverage.

Interventions
A supplementary immunisation activity, to support a single-dose measles vaccination programme in India and to improve immunisation coverage was compared with the single-dose programme alone.

Location/setting
India/primary care.

Methods
Analytical approach:
A state-transition Markov model was constructed to determine the clinical and cost-effectiveness of the vaccination programmes. A five-year time horizon was used and the author stated that the perspective was that of the health care provider.

Effectiveness data:
The effectiveness data were from selected published papers, which were mainly of observational and health economic studies. The main clinical parameters were the efficacy of vaccination, complications following vaccination, the transmission rate for measles, and the coverage of vaccination.

Monetary benefit and utility valuations:
Disability weights were derived from the Global Burden of Disease Study.

Measure of benefit:
The measure of benefit was disability-adjusted life-years (DALYs) gained and these were discounted at 3% per annum.

Cost data:
The direct costs included those of the vaccine; transport, administration, and waste disposal associated with the vaccine; and the vaccination and surveillance campaign. The drug unit costs and associated costs were from the National Policy for Universal Immunization Program in India. The costs were in Indian rupees (INR).
Analysis of uncertainty:
One-, two- and three-way sensitivity analyses were performed to assess the impact of uncertainty in the probability that the vaccine produced immunity, the probability of developing measles, and the vaccination rates achieved.

Results
With a single-dose measles vaccination programme, there were 139,982 measles cases, which resulted in 3,500 deaths and 125,349 DALYs lost. With the supplementary immunisation activity, the number of measles cases was 74,504, which resulted in 1,863 deaths and 66,712 DALYs lost.

The additional cost of the supplementary immunisation activity was estimated to be INR 25,177,095. The incremental cost per case of measles averted was INR 385, the incremental cost per death avoided was INR 15,381 and the incremental cost per lost DALY averted or DALY gained was INR 430.

The results were most sensitive to changes in the probability of developing immunity following vaccination, but for all sensitivity analyses the incremental cost per DALY remained below 950 US dollars.

Authors’ conclusions
The author concluded that a supplementary immunisation activity for measles, in areas with low vaccination coverage, was cost-effective in reducing the mortality and morbidity associated with measles.

CRD commentary
Interventions:
The interventions were described well and the analysis included the current practice in the author’s setting. The strategies are likely to be relevant in other settings.

Effectiveness/benefits:
The effectiveness data were from several published studies, but the method used to find and select these studies was not reported. No quality assessment and no detail of these studies were given. Their references were reported, but this was insufficient to ascertain whether the best available evidence was used.

Costs:
The author reported that the perspective was that of the health care provider and the costs appear to have been consistent with this. The cost estimates were also relevant to the study and setting, but the price year was not explicitly reported and neither was a detailed breakdown of the cost items. This limits the possibility of replicating the cost analysis in other settings. The sources of data were only partially referenced; for example, the reference for the National Pulse Polio campaign was not given.

Analysis and results:
The analytic approach was satisfactorily reported and the model structure was presented in a diagram for clarity. The results were reported clearly and sufficiently. Appropriate one-way and multi-way sensitivity analyses were performed and their impact was described briefly. They assessed the parameter uncertainty to an extent, but probabilistic sensitivity analysis would have more thoroughly captured its impact on the results. The reporting was satisfactory and the base-case costs, outcomes, and effectiveness and the incremental costs were presented.

Concluding remarks:
The methods and reporting of the study were mostly satisfactory, but the selection and details of the clinical and economic data sources were not described, which means that the results should be considered with caution.

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