Modeling cost-effectiveness of cervical cancer screening in Hungary


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 objective was to evaluate the cost-effectiveness of two national cervical screening programmes in Hungary. The authors concluded that providing services closer to the population was a rational economic option. Study methodology was of adequate quality. Methods and results were reported adequately. It was unclear which of the two screening interventions evaluated was the most cost-effective.

Type of economic evaluation
Cost-utility analysis

Study objective
The objective was to evaluate the cost-effectiveness of two national cervical screening programmes in Hungary.

Interventions
Two programmes were evaluated in the study. Scenario one was screening by cytology and colposcopy in outpatient services by gynaecologist with active support (mass media, letters, information leaflets and local leaders and general practitioners). Scenario two was pap smear performed by trained public health nurses locally in the offices of general practitioners (colposcopic examination not offered). These interventions were compared to no screening.

Location/setting
Hungary/Primary and outpatient care.

Methods
Analytical approach:
A decision analytic Markov model was used to assess costs and outcomes associated with the interventions. The model had been previously published but was not used in its entirety; only the core disease progression component of the model was used (see Other Publications of Related Interest). The model estimated the lifespan of women on the basis of participation in one of the screening programmes. The time horizon was 20 years. The economic analysis was reported to adopt the perspective of the public healthcare payer.

Effectiveness data:
Clinical and effectiveness data were derived from previously published studies. Transition probabilities were calculated on the basis of incidence. The incidence rate was assumed to be constant. Prevalence data of different stages was estimated from three studies. The main effectiveness measures used in the model were probability of detecting cervical cancer at different disease stages. These estimates were derived from previously published studies.

Monetary benefit and utility valuations:
Age-specific utility estimates in the general population were derived from the Hungarian National Health Survey in 2000 and from previously published studies. Weights for newly diagnosed cancers at different stages were derived from the original published modelling study undertaken in USA (see Other Publications of Related Interest). Weights for undiagnosed and treated cancer were based on expert opinion.

Measure of benefit:
The summary measure of benefit was quality-adjusted life-years (QALYs) gained. Benefits could be generated over a 20-year time period. Future benefits were discounted using an annual rate of 5%.
Cost data:
Direct costs were pap smear, cytological examination, gynaecological screening, anti-inflammatory treatment, conisation and costs of treating cervical cancer (including in-patient, outpatient, imaging, home care and drugs). Healthcare system reimbursement of travel costs to attend screening and travel costs were included. Costs of treating cervical cancer were derived from individual patient-level data from two Hungarian hospitals. Other costs were derived from tariffs obtained from the National Health Insurance Fund. The price year was 2006. Costs could be incurred over a 20-year time horizon. Future costs were discounted using an annual rate of 5%. All costs were reported in US dollars ($), adjusted for purchasing power parity, using the exchange rate of $1=135 Hungarian forints.

Analysis of uncertainty:
The authors reported that a series of one-way sensitivity analyses were performed by varying model parameters by +/-10%. Probabilistic sensitivity analyses were undertaken by defining distributions for key input parameters and conducted using 5,000 Monte Carlo simulations with sampling from the probability distributions. Results of the probabilistic sensitivity analysis were presented using a cost-effectiveness acceptability curve.

Results
Average cost per patient was $67 for no screening, $297 for scenario one and $171 for scenario two.

Average QALYs gained were 11.1670 for no screening, 11.1740 for scenario one and 11.1725 for scenario two.

Costs and benefits were combined using an incremental cost-utility ratio (additional cost per QALY gained). Compared to no screening, the incremental cost-utility ratio was $33,100 for scenario one and $18,990 for scenario two.

Results of the probabilistic sensitivity analysis showed that at a willingness to pay threshold of $30,000 per QALY the probability that each scenario was cost-effective compared to no screening was 99.9% for scenario two and 72% for scenario one.

Results of the one-way sensitivity analysis showed that screening using scenario two for ages younger than 35 years was associated with incremental cost-utility ratios higher than $30,000 per QALY gained compared to no screening.

Authors' conclusions
The study objective was to evaluate the cost-effectiveness of two national cervical screening programmes in Hungary. The authors concluded that providing services closer to the population was a rational economic option.

CRD commentary
Interventions:
The interventions under study were reported adequately. The strategies were valid in the authors setting but may not be relevant to other settings/countries.

Effectiveness/benefits:
Clinical and effectiveness data were derived from selected published studies. The authors adequately reported the main effectiveness estimates used in the model and their sources. It was not clear how studies were identified or selected for use. No systematic review of the literature was reported so it was not possible to determine whether the best available evidence was used. There were no details of the studies from which data were derived so it was not possible to judge the robustness/validity of these data.

Costs:
The perspective adopted in the economic analysis was reported explicitly. It appeared that all relevant costs were included in the analysis. Sources and methods used to obtain cost information were reported adequately. Price year, time horizon, discount rate and currency conversions were all stated clearly. The methods used to obtain estimates were appropriate. The costs results were likely to be setting specific.

Analysis and results:
A decision analytic Markov model was used to synthesise cost and outcome information. Full details of the model structure, including a graphical depiction, were provided. Uncertainty in the model was tested exhaustively using a
A series of one-way and probabilistic sensitivity analyses and the results were presented adequately using a cost-effectiveness acceptability curve. The authors reported that their study was prone to the uncertainties of the model structure and its parameters. The authors incrementally compared the costs and outcomes of the two interventions against those of no screening. They did not compare scenarios one and two head-to-head so it was not clear which was most cost-effective.

**Concluding remarks:**
Study methodology was of adequate quality. Methods and results were reported adequately. Scenarios one and two were not compared incrementally with each other so it was unclear which of these two screening interventions was the most cost-effective.

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### Other publications of related interest


### Indexing Status

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### MeSH

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