Economic evaluation of a mammography-based breast cancer screening programme in Spain

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
A mammography-based breast cancer screening programme.

Type of intervention
Screening.

Economic study type
Cost-effectiveness analysis.

Study population
The study population comprised women between 50 and 65 years of age.

Setting
Secondary care. The study was carried out in Spain.

Dates to which data relate
The data for the effectiveness analysis and the use of resources were collected in 1991. Projections of data were made to 2010, based on age-adjusted mortality rates. 1991 prices were used.

Source of effectiveness data
The evidence for the final outcome was derived from a review of previously completed studies.

Modelling
A decision tree based on a Markov model was used in estimating benefits and costs. The purpose of the model was to integrate the following parameters: screening costs, diagnostic costs, mammography sensitivity and specificity, health care costs, discount rate and potential effectiveness of the evaluated programme, measured by deaths avoided or years of life saved. In the model the disease occurred according to predefined probabilities.

Outcomes assessed in the review
The outcomes included were deaths avoided and years of life saved.

Study designs and other criteria for inclusion in the review
The efficacy of mammography was taken from studies considering women of similar age and with similar time intervals.
Sources searched to identify primary studies
The sources searched by the authors were the Navarre Screening Program, Guipuzcoa Cancer Registry, National Epidemiology centre, National Statistics Institute, Fundation Jimenez Diaz Hospital and results from several studies conducted in Sweden.

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
7 primary studies were included in the review.

Methods of combining primary studies
Not stated.

Investigation of differences between primary studies
Not stated.

Results of the review
The effectiveness analysis results were as follows:

- sensitivity of mammography: 0.90, specificity: 0.98,
- effectiveness (as measured by the percentage of breast cancer mortality reduction): 0.24,
- programme compliance: 70%.

Measure of benefits used in the economic analysis
Lives saved and life years gained were used as outcome measures in the economic analysis.

Direct costs
Only health system costs were considered. Programme costs (1993 prices) included human resources, advertising, information and amortization, repair and maintenance of mammographic equipment, X-ray film, travelling expenses, stationary, training activities, other activities and other expenses. In calculating diagnosis-associated costs (for which no price year was stated) the authors considered the highest and lowest costs, including all possible tests, or only chest X-ray and bone gammagrapy as extension diagnosis tools. Health care costs (derived using a decision tree based on a Markov model) included surgery costs, follow-up costs and associated therapy costs (chemotherapy, radiation therapy and hormone therapy). Costs were discounted at 6%.

Currency
European Currency Units (ECU).

Sensitivity analysis
A sensitivity analysis was conducted. The following variables were investigated: highest incidence and mortality associated with breast cancer, programme compliance, specificity, highest and lowest efficacy (several values depending on age groups), and a discount rate. The method used was threshold analysis.

**Estimated benefits used in the economic analysis**

The screening programme for breast cancer saved 13,320 more lives and gained 223,751 life years compared to the alternative of no screening.

**Cost results**

The cost of the programme was 504,021,000 ECUs. The cost including screening, diagnosis and treatment, and follow-up for the programme with screening was 743,202,000 ECUs and without screening was 270,122,000 ECUs.

**Synthesis of costs and benefits**

The estimated benefits and costs were combined as cost/avoided death discounted and cost/saved life year. An incremental analysis was not performed. The cost-effectiveness ratio per avoided death was 115,500 ECUs and per life year saved was 7,300 ECUs. Including women aged 45–49 years in the programme raised this ratio to 229,000 and 9,400 ECUs respectively.

**Authors' conclusions**

The biennial mammography screening programme strategy generates, in all analysis scenarios, an additional cost per avoided death as well as per life year saved when compared to the no-screening alternative.

**CRD COMMENTARY - Selection of comparators**

A justification was given for the comparator used. The alternative option of no screening mammography refers to treating only those cases already symptomatic or incidentally found (i.e. the current practice).

**Validity of estimate of measure of benefit**

Effectiveness data were based partly on the RCT, and were likely to be internally valid, however more details on the derivation and justification of the effectiveness data would have been useful.

**Validity of estimate of costs**

Only costs to the health system for a breast cancer screening programme based on mammography were considered. Quantities and costs were reported separately. The inclusion of indirect costs and the cost of treating side effects would also have been useful.

**Other issues**

As there is no evidence of a systematic search of the literature, the extent to which all relevant studies were included is unclear.

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