A rapid-response economic evaluation of the UK NHS Cancer Reform Strategy breast cancer screening program extension via a plausible bounds approach

Madan J, Rawdin A, Stevenson M, Tappenden P

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 aim was to estimate the cost-effectiveness of a breast cancer screening programme for women aged 47 to 49 years and to determine the key factors affecting this estimate. The authors concluded that the psychological effects of screening were likely to drive its cost-effectiveness and further research was needed on these effects. The methods were good and the authors’ conclusions appear to be appropriate.

Type of economic evaluation
Cost-utility analysis

Study objective
The aim was to estimate the cost-effectiveness of a breast cancer screening programme for women aged 47 to 49 years and to determine the key factors affecting this estimate.

Interventions
Annual screening every three years by mammography was compared with no intervention.

Location/setting
UK/primary care.

Methods
Analytical approach:
A decision-analytic model was constructed to determine the clinical and economic impact of the alternative screening strategies. The authors did not state the perspective.

Effectiveness data:
The clinical data were from a published randomised controlled trial and the UK NHS Breast Screening Programme (NHSBSP), which provided observational data. The key clinical parameters were the cancers detected, the referral rate, the positive predictive value, and survival.

Monetary benefit and utility valuations:
The utility estimates were from a discussion paper (Kind, et al. 1999, see ‘Other Publications of Related Interest’ below for bibliographic details).

Measure of benefit:
The benefit measure was quality-adjusted life-years (QALYs) and these were discounted at an annual rate of 3.5%. Life-years saved were reported.

Cost data:
The analysis included the direct medical costs of screening, diagnosis, and treatment, for breast cancer. These costs were from NHS Reference Costs. The price year was 2007 and all costs were reported in UK pounds sterling (£). Future costs were discounted at an annual rate of 3.5%.

Analysis of uncertainty:
One-way and probabilistic sensitivity analyses were carried out. The one-way sensitivity analysis varied key model
inputs, including the survival time for a fatal cancer, and the QALY loss due to the short-term anxiety from a false-positive result. A Monte Carlo simulation was used to generate cost-effectiveness acceptability curves.

**Results**
The survival rate was 80.0% for screening and 75.4% for no screening; a difference of 4.6%. Screening was associated with 1.66 lives saved and 17.5 QALYs gained per 10,000 women.

The incremental cost of the screening was £473,000 per 10,000 women, and this was associated with an incremental cost-effectiveness ratio of £27,400 per QALY gained.

The probabilistic sensitivity analysis indicated that screening was cost-effective in 29% of simulations, at a threshold of £20,000 per QALY. The one-way sensitivity analysis indicated that screening became less cost-effective when the QALY loss due to anxiety was set at 0.028 per false-positive result.

**Authors' conclusions**
The authors concluded that the psychological effects of screening were likely to drive its cost-effectiveness for women aged 47 to 49 years. They suggested that further research was needed to better understand and quantify these effects.

**CRD commentary**

**Interventions:**
The interventions were appropriate comparators. The strategies were relevant to the authors' setting and were likely to be relevant for other settings. The authors did not describe the intervention and comparator in detail, but they provided a reference, in which they were described (Moss, et al. 2005, see 'Other Publications of Related Interest' below for bibliographic details).

**Effectiveness/benefits:**
This economic evaluation assessed a particular programme and it used data from this programme and a related UK trial. There was no indication that other data were searched for in the literature. QALYs and years of life saved were appropriate outcomes given the impact of the disease and the screening programme on quality of life and survival. Limited information on the utility data was provided and these data were from 1999. The source for the utility loss used to assess the psychological impact of a false-positive result was unclear, but it appears to have been assumed by the authors. Data from clinical studies would have been more supportive of the authors' conclusion, which relied on this valuation.

**Costs:**
The perspective was not stated, but those costs relevant to the UK NHS perspective appear to have been considered. The categories of costs and their sources were reported appropriately. The data were relevant to the study setting and were from established sources. The time horizon was not reported, but other details, such as the price year and discounting, were given.

**Analysis and results:**
A marginal analysis was appropriately used to assess the relative cost-effectiveness of the strategies. The uncertainty was extensively addressed in deterministic and probabilistic sensitivity analysis. The results were presented in full. The uncertainty in the structure and parameters was appropriately evaluated.

**Concluding remarks:**
The methods were good and the authors' conclusions appear to be appropriate.

**Funding**
Funding received from the UK Department of Health.

**Bibliographic details**
Madan J, Rawdin A, Stevenson M, Tappenden P. A rapid-response economic evaluation of the UK NHS Cancer

PubMedID
19878494

DOI
10.1111/j.1524-4733.2009.00667.x

Original Paper URL

Other publications of related interest


Indexing Status
Subject indexing assigned by NLM

MeSH
Breast Neoplasms /diagnosis /economics /prevention & control; Cost-Benefit Analysis; Early Detection of Cancer /economics; Female; Great Britain; Health Care Reform /economics; Humans; Middle Aged; Monte Carlo Method; Outcome and Process Assessment (Health Care); Quality-Adjusted Life Years; Sensitivity and Specificity; State Medicine /economics; Survival Analysis

AccessionNumber
22010000603

Date bibliographic record published
04/08/2010

Date abstract record published
29/06/2011