Cost-effectiveness of opportunistic versus organised mammography screening in Switzerland

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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 compared the cost-effectiveness of alternative organised and opportunistic programmes of screening for breast cancer in women aged 50 to 69 years in Switzerland. The authors concluded that both organised and opportunistic screening were effective, but the cost per life-year gained for opportunistic screening was twice that for organised screening. There were a few limitations to the study, but the methods and results were presented well, and the authors' conclusions appear to be appropriate.

Type of economic evaluation

Cost-effectiveness analysis, cost-utility analysis

Study objective

The objective was to compare the cost-effectiveness of alternative screening programmes for breast cancer in women aged 50 to 69 years in Switzerland.

Interventions

Organised biennial mammography screening was compared with opportunistic biennial mammography screening. Five biennial screening scenarios were compared according to the proportion of the target population (women aged 50 to 69 years) who participated: 40% opportunistic; 80% opportunistic; 80% organised; 60% organised with 20% opportunistic; and 40% organised with 40% annual opportunistic.

Location/setting

Switzerland/primary and secondary care.

Methods

Analytical approach:

A published state-transition simulation model was adapted to determine the clinical and economic impact of the alternative screening programmes. The model had a lifetime horizon. The authors did not state the perspective adopted.

Effectiveness data:

The clinical data came from published literature and included data from randomised controlled trials and observational data from a selection of epidemiological and clinical studies known to be relevant to the Swiss setting, such as the Vaud Cancer Registry and the Geneva Cancer Registry. The key clinical parameters were the screening sensitivity, the incidence and prevalence of breast cancer, and survival.

Monetary benefit and utility valuations:

The utility estimates were derived from a published study (de Haes, et al. 1991, see 'Other Publications of Related Interest' below for bibliographic details).

Measure of benefit:

The benefit measure was the number of quality-adjusted life-years (QALYs) and these were discounted at a rate of 3% per annum. Life-years saved were also reported.

Cost data:

The analysis included the direct medical costs of diagnosis, examination, and treatment that related to the screening for and treatment of breast cancer. These costs were derived from a combination of a Swiss health insurance company's records of health care services, which were converted into Euros (EUR), and published Dutch cost estimates, which were adjusted to Swiss costs using a health care specific purchasing power parity conversion ratio. The costs were discounted at 3% per year.

Analysis of uncertainty:
Univariate sensitivity analysis was performed by varying the sensitivity of opportunistic relative to organised mammogram screening.

Results
The expected QALYs for the target population were 21,239,159 for no screening. Compared with no screening the additional QALYs were 15,656 for 40% opportunistic, 31,161 for 80% opportunistic, 31,506 for 80% organised, 31,547 for 60% organised with 20% opportunistic, and 35,179 for 40% organised with 40% annual opportunistic screening.

The expected cost for the target population was EUR 1,239 million for no screening. Compared with no screening the additional costs were EUR 398 million for 40% opportunistic, EUR 796 million for 80% opportunistic, EUR 391 million for 80% organised, EUR 492 million for 60% organised with 20% opportunistic, and EUR 971 million for 40% organised with 40% annual opportunistic screening.

The cost per QALY gained compared with no screening was EUR 25,418 for 40% opportunistic, EUR 25,541 for 80% opportunistic, EUR 12,424 for 80% organised, EUR 15,601 for 60% organised with 20% opportunistic, and EUR 27,599 for 40% organised with 40% annual opportunistic screening.

Varying the sensitivity of opportunistic relative to organised screening caused the cost per QALY gained to vary from EUR 24,467 to EUR 26,700 for 80% opportunistic screening.

Authors' conclusions
The authors concluded that both organised and opportunistic screening were effective in Switzerland, but the cost per life-year gained for opportunistic screening was twice that for organised screening.

CRD commentary
Interventions:
The interventions were well described and appeared to be appropriate comparators; no screening and five alternative screening programmes. These strategies were relevant in the authors' setting and are also likely to be relevant in other settings.

Effectiveness/benefits:
The use of data from Swiss Cantons was appropriate for ensuring the relevance of the modelled data to the setting. The sensitivity of screening was not clear from the evidence available and the authors appropriately performed a sensitivity analysis varying the sensitivity of opportunistic compared with organised screening to assess its impact on the results. Little information beyond the reference for the source of the utility data was provided and these data were published a long time ago. The methodology used to calculate the QALYs was not clear. QALYs and years of life saved were appropriate outcomes in view of the impact of the disease and the screening programme on quality of life and survival.

Costs:
The perspective was not stated, but it appears that all those costs relevant to the perspective of a health care provider were considered. The categories of costs were reported and the methods used to convert these costs were fully described and appear to have been appropriate, which improves the ability to replicate these estimates for other settings. The price year was not given, but discounting was used appropriately.

Analysis and results:
An incremental analysis was appropriately used to assess the relative cost-effectiveness of the strategies. The issue of

uncertainty was addressed, but only one parameter was varied. Multivariate and probabilistic sensitivity analyses would have better assessed the uncertainty around the key parameters and the results should be interpreted with caution due to this lack of assessment. The results were presented in full and the authors highlighted the strengths and weaknesses of their analysis.

Concluding remarks:
There were a few limitations to the study, but the methods and results were presented well. The authors' conclusions appear to be appropriate, but should be considered with caution in view of the methodological limitations.

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Bibliographic details
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Other publications of related interest
de Haes JC, de Koning HJ, van Oortmarssen GJ, van Agt HM, de Bruyn AE, van Der Maas PJ. The impact of a breast cancer screening programme on quality-adjusted life-years. International Journal of Cancer 1991; 49(4): 538-544.

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MeSH
Aged; Breast Neoplasms /mortality /radiography; Calibration; Computer Simulation; Cost-Benefit Analysis; Early Detection of Cancer; Female; Health Care Costs; Humans; Mammography /economics /methods; Mass Screening /economics /methods; Middle Aged; Models, Econometric; Quality-Adjusted Life Years; Sensitivity and Specificity; Switzerland

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