
An economic rationale for prostate cancer screening

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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.

Health technology

(a) Screening for prostate cancer using prostate-specific antigen(PSA) testing with and without digital rectal examination(DRE)

(b) Screening for breast cancer using mammography with and without clinical breast examination.

Type of intervention

Secondary prevention

Economic study type

Cost-effectiveness analysis.

Study population

Men aged 50 to 70 and women aged 50-69.

Setting

The practice setting for breast cancer screening was not specified (it might be primary care). Prostate cancer screening was in part performed in a tertiary care centre. The economic study was carried out in the USA.

Dates to which data relate

Data on prostate cancer screening related to 1989-1992 and the data on breast cancer screening related to 1980-1992. The cost data were for the year 1992.

Source of effectiveness data

Synthesis of previous studies.

Modelling

A model was used to estimate costs.

Outcomes assessed in the review

Cancer detection

Study designs and other criteria for inclusion in the review

Recent, prospective (multicentre and non-multicentre) prostate cancer screening studies were used. Details on breast screening studies were not given.

Sources searched to identify primary studies

Not stated.

Criteria used to ensure the validity of primary studies

Not stated.

Methods used to judge relevance and validity, and for extracting data

No judgement criteria for assessing the validity of primary studies were given by the authors. Summary statistics were used to report data from the primary studies.

Number of primary studies included

Two studies on prostate cancer screening and two studies on breast cancer screening were used.

Methods of combining primary studies

Not combined.

Investigation of differences between primary studies

Not investigated.

Results of the review

The detection rates of breast cancer reported in one study were 0.60%, 1.3% and 0.89% for age groups 50-59, 60-69 and 50-69 respectively. The detection rate reported in the other study was 0.72%, age group 50-59. The detection rates of prostate cancer reported in the multicentre study were 2.9%, 6% and 4.6% for age groups 50-59, 60-69 and 50-69 respectively. The single centre study reported a detection rate of 2.5%, age group 50-70.

Measure of benefits used in the economic analysis

Cancer detection and long-term survival rates.

Direct costs

Costs and quantities were reported separately. The total health service charges for screening tests and biopsy and pathology charges for prostate cancer, diagnostic mammography and breast ultrasound, biopsy charges and charges for anaesthesia and the operating room for breast cancer were analysed. The resources costed were derived using a model based on the information provided in the effectiveness studies previously described. The estimation of costs was based on the Medicare fee schedules for 1992.

Currency

US dollars

Sensitivity analysis

A sensitivity analysis was carried out to test the variability in cost data.

Estimated benefits used in the economic analysis

The detection rates of breast cancer reported in one study were 0.60%, 1.3% and 0.89% for age groups 50-59, 60-69

and 50-69 respectively. The detection rate reported in the other study was 0.72%, age group 50-59. The detection rates of prostate cancer reported in the multicentre study were 2.9%, 6% and 4.6% for age groups 50-59, 60-69 and 50-69 respectively. The single centre study reported a detection rate of 2.5%, age group 50-70. Moreover, breast cancer screening decreases the mortality from breast cancer in women aged 50 by 30%. The impact of prostate cancer screening on mortality is not yet known. However, the authors estimated the decrease in mortality from prostate cancer to be between 25.8% and 37.7%.

Cost results

Total costs per person screened for prostate cancer screening in the multi-centre study were \$85.64, \$128.2 and \$109.1 for age groups 50-59, 60-69 and 50-69 respectively. In the single centre study the cost per patient was \$55.12 for age-group 50-70. Total costs per person screened for breast cancer screening in one of the studies investigated were \$92.94, \$104.23 and \$97.67 for age groups 50-59, 60-69 and 50-69 respectively. In the other study the cost per patient was \$110.04 for age-group 50-59.

Synthesis of costs and benefits

The cost per cancer detected for prostate screening for age-groups 50-59, 60-69 and 50-69 were \$2,953, \$2,137 and \$2,372 respectively in the multicentre study, and \$2,205 in the single centre study (age 50-70). In one of the studies, the cost per cancer detected for breast cancer for the same age-groups were \$15,490, \$8,018 and \$10,975 respectively; in other study it was \$15,284 (age group 50-59).

In terms of the impact of cancer screening on patient morbidity, prostate cancer screening would be equally cost-effective to breast cancer screening if it improved prostate cancer mortality by only 5.7% to 8.1%.

Authors' conclusions

Breast cancer screening was 3.7 to 5.2 times more costly than prostate cancer screening in terms of cost per cancer detected. The cost per person screened was however similar for both types of cancer. The higher cost of breast screening was due to its lower detection rate. The authors therefore concluded that prostate cancer screening was at least equally cost effective than breast cancer screening.

CRD Commentary

This study was not able to look at cost of screening per survival rate and therefore limits the use of the study in looking at the cost-effectiveness of screening and treatment. Moreover, a quantitative review of the effectiveness data, where possible, could be useful.

Implications of the study

More research is necessary for the assessment of the mortality rates.

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