Cost-effectiveness comparison of five interventions to increase mammography 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
Mammography promotion strategies to increase compliance in women being noncompliant for mammography.

Type of intervention
Screening.

Economic study type
Cost-effectiveness analysis.

Study population
Women between the ages of 50 and 85 years who were noncompliant for mammography (i.e., women with no history of breast cancer and no mammography in the previous 15 months).

Setting
Primary care. The economic study was carried out in Indiana, USA.

Dates to which data relate
Not reported.

Source of effectiveness data
Effectiveness data were derived from a single study.

Link between effectiveness and cost data
Costing was prospectively performed on the same patient sample as that used in the effectiveness analysis.

Study sample
Power calculations were not used to determine the sample size. The study sample consisted of 808 noncompliant women. Having collected the baseline information on past behaviour and current beliefs, the study participants were randomized to the following groups:

1. no counselling group (n=143) with a mean age of 61.27 years;
2. the telephone group (n=119) with a mean age of 62.16 years;
3. the in-person group (n=132) with a mean age of 62.19 years;
4. the physician letter group (n=137) with a mean age of 61.03 years;
(5) the telephone and letter group (n=141) with a mean age of 60.42, and;

(6) the in-person and letter group (n=136).

The participation rate was 39% of all eligible women invited for participation in the study. 12 trained graduate nurses were employed as research assistants to deliver counselling interventions.

**Study design**

The study was a randomized controlled trial carried out on women from a large health maintenance organisation (HMO) and a general medicine clinic. The duration of the follow-up was 6 weeks. The loss to follow up was 13.8% (112/808). Tailored counselling protocols were designed for in-person or telephone counselling based on the theoretical framework of the Health Belief Model (HBM) which was used to evaluate the women's perceived susceptibility to breast cancer and perceived benefits and barriers to mammography at baseline.

**Analysis of effectiveness**

The principle used in the analysis of effectiveness (intention to treat or treatment completers only) was not explicitly specified. The primary outcome measure was mammography compliance rate. The study groups were comparable in terms of 11 socioeconomic features. Significant group differences were investigated using a logistic regression model employing compliance as the dependent variable and the group as the independent variable.

**Effectiveness results**

The mammography compliance rate was:

- 18.2% for the no counselling group,
- 23.1% for the telephone group,
- 34.1% for the in-person group,
- 15% for the physician letter group,
- 35.6% for the telephone plus letter group,
- and 30.5% for the in-person plus letter group.

According to the results of the logistic regression model, the p-values for the groups with significantly different results from the control group were:

- 0.01 for the in-person group,
- 0.001 for the telephone plus letter group,
- and 0.03 for the in-person plus letter group.

The corresponding values for the odds ratios were:

- 2.33 for the in-person group,
- 2.49 for the telephone plus letter group,
- and 1.98 for the in-person plus letter group.

**Clinical conclusions**
The two in-person groups and the telephone plus letter group were significantly different from the control group for mammography compliance.

**Measure of benefits used in the economic analysis**
The benefit measure was mammography compliance rate.

**Direct costs**
Costs were not discounted due to the short follow-up period of the study. Quantities of resource use were only reported in terms of mean time requirements and number of contacts for each study group. The cost components were not reported separately. The cost analysis covered the costs of labour, consumable supplies and ancillaries. The perspective adopted in the cost analysis was not explicitly specified. Activity logs kept by project staff were the main source of resource use data collection. The date to which the price data referred was not explicitly specified. The fixed costs of the interventions were not covered in the cost analysis because of difficulties involved in their measurement.

**Indirect Costs**
Not included.

**Currency**
US dollars ($).

**Sensitivity analysis**
Not conducted.

**Estimated benefits used in the economic analysis**
The mammography compliance rate was:

- 18.2% for the no counselling group,
- 23.1% for the telephone group,
- 34.1% for the in-person group,
- 15% for the physician letter group,
- 35.6% for the telephone plus letter group,
- and 30.5% for the in-person plus letter group.

According to the results of the logistic regression model, the p-values for the groups with significantly different results from the control group were:

- 0.01 for the in-person group,
- 0.001 for the telephone plus letter group,
- and 0.03 for the in-person plus letter group.

The corresponding values for the odds ratios were:

- 2.33 for the in-person group,
2.49 for the telephone plus letter group,

and 1.98 for the in-person plus letter group.

**Cost results**
The mean intervention cost was:

- $0 for the no counselling group,
- $12.52 for the telephone group,
- $14.21 for the in-person group,
- $1.28 for the physician letter group,
- $13.58 for the telephone plus letter group,
- and $18.03 for the in-person plus letter group.

**Synthesis of costs and benefits**
The per capita cost of a 1% increase relative to the control group was calculated as the measure of cost-effectiveness, resulting in values of:

- $2.55 for the telephone group,
- $0.89 for the in-person group,
- $0.78 for the telephone plus letter group,
- and $1.47 for the in-person plus letter group.

The cost-effectiveness ratio was not calculated for the physician letter group since it had lower effectiveness than the strategy of no counselling.

**Authors' conclusions**
A tailored phone prompt and physician reminder is an effective and economical intervention to increase mammography.

**CRD COMMENTARY - Selection of comparators**
The reason for the choice of the comparator is clear.

**Validity of estimate of measure of benefit**
The effectiveness results are likely to be internally valid given the adoption of a randomized design. However, as the authors acknowledged it may have been adversely affected by the baseline survey.

**Validity of estimate of costs**
Quantities/costs were not reported separately. Some details of methods of cost estimation were given. Cost results may not be generalisable outside the authors' setting.
Other issues
Appropriate comparisons were made with other studies. Uncertainties surrounding the effectiveness and cost data were not addressed by a comprehensive sensitivity analysis. As the authors noted, the results of this study, which was based on the work of research assistants whose primary mission was to increase mammography compliance, may not be generalisable to healthcare settings staffed by nurses.

Implications of the study
Further research should confirm this finding and address its applicability to practice.

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