Improving attendance for breast screening among recent non-attenders: a randomised controlled trial of two interventions in primary care


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
The use of primary care-based interventions, which were intended to improve attendance for breast screening among women who failed to attend. The two interventions were a letter from the general practitioner (GP), and a flag in the notes to prompt practitioners or nurses to mention breast screening during routine consultation.

Type of intervention
Other: intervention for screening.

Economic study type
Cost-effectiveness analysis.

Study population
The study population comprised women who had failed to attend a recent appointment for routine third-round breast screening. Patients were excluded if they had explicitly refused their NHS breast screening programme invitation, had been removed from the programme by their GP, or were known to have moved away from the area.

Setting
The setting was primary care. The economic study was carried out at breast screening units in the areas of North and West London and the West Midlands, in the UK.

Dates to which data relate
The effectiveness and resource use data were gathered from October 1996 to June 1997. The prices used in the analysis referred to 1998 to 1999.

Source of effectiveness data
The effectiveness data were derived from a single study. This was also reported in a separate publication (see Other Publications of Related Interest).

Link between effectiveness and cost data
Costing was undertaken prospectively on a sub-sample of the patients enrolled for the effectiveness analysis.

Study sample
Power calculations indicated that a sample size of 1,100 to 1,500 eligible women would result in 85% power to detect differences of 3.5 to 4.0% in attendance rate, with a two-sided 5% significance level, assuming a spontaneous uptake of 3% after non-attendance. All eligible women (1,158) in the 13 practices (from the 53 originally identified), which
participated in the study, were contacted and were allocated into four study groups. There were 289 women with a mean age of 55.8 (+/- 4.3) years in the control group. There were 291 women with a mean age of 55.7 (+/- 4.5) years in the letter only group. There were 290 women with a mean age of 56.1 (+/- 4.3) years in the flag only group. There were 288 women with a mean age of 55.8 (+/- 4.6) years in the letter and flag group. The baseline characteristics of the groups were presented.

**Study design**

This was a randomised controlled trial, which was carried out in 13 practices in areas of North and West London and the West Midlands. The unit of randomisation was the patient and not the practice. Randomisation was carried out with a random permuted block procedure, using random number tables and sealed envelopes. The length of follow-up was 6 months. Only 10 women did not provide final data, which were available for 99% of the sample.

**Analysis of effectiveness**

The analysis of the clinical study was conducted on an intention to treat basis. The primary health outcome was attendance for third-round breast screening (uptake rate). The adjusted odds ratio (OR) for attendance was produced using logistic regression analysis, stratified by practice. The crude relative risks (RRs) for the effects of the two main interventions were also presented. The study groups were reported to have been comparable at baseline. The participating practices were generally found to be representative of the population of eligible practices in the areas, with the exception of practice size. Using logistic regression, the effects of flag activation, consultation in the past 3 years and screening history, were also tested.

**Effectiveness results**

The uptake rates were 5.9% (95% confidence interval, CI: 3.5 - 9.3) in the control group, 10.8% (95% CI: 7.4 - 14.9) in the letter group, 10% (95% CI: 6.8 - 14.1) in the flag group, and 12.3% (95% CI: 8.7 - 16.7) in the letter and flag group.

The letter had a significant effect on attendance (OR 1.51, 95% CI: 1.02 - 2.26; p=0.04), while the flag (OR 1.39, 95% CI: 0.93 - 2.07; p=0.10) and flag-letter interaction (OR 0.65, 95% CI: 0.29 - 1.47; p=0.30) had a non significant effect.

Similar results were obtained for the crude RRs. These were 1.44 (95% CI: 1.01 - 2.07) for the letter, 1.34 (95% CI: 0.94 - 1.91) for the flag, and 0.68 (95% CI: 0.33 - 1.40) for the interaction.

Logistic regression analysis on women who received the flag showed that women for whom the flag was activated were much more likely to attend screening than those for whom the flag had not been activated (OR 4.3, 95% CI: 2.4 - 7.8; p<0.001).

For consultation in the past 3 years, the p-values were 0.26 for the letter and 0.85 for the flag. For screening history, the p-values were 0.44 for the letter and 0.58 for the flag.

**Clinical conclusions**

The effectiveness analysis showed that attendance was statistically significantly improved by the letter intervention, while the effect of the flag intervention was smaller.

**Measure of benefits used in the economic analysis**

The benefit measure used in the economic analysis was uptake rate, as derived from the effectiveness analysis. No discounting was carried out.

**Direct costs**

Discounting was irrelevant since the costs were incurred over 6 months. The unit costs and the quantities of resources
were not reported separately. The cost items included in the analysis were additional attendances generated by the interventions, additional consultations, lengthier consultations, and administrative processes associated with the interventions. The cost/resource boundary adopted was that of the NHS. The costs were estimated from published sources (not reported in the paper). The resources were estimated from the trial (20% random sub-sample of the total sample used in the effectiveness analysis) and were measured from October 1996 to June 1997. The prices referred to 1998 to 1999.

Statistical analysis of costs
It was assessed that the sub-sample used to derive the resource use data had 80% power to detect an 18% difference in the proportion consulting, with a two-sided 5% significance level. Statistical analyses of the total costs were not reported.

Indirect Costs
The indirect costs were not included.

Currency
UK pounds sterling (£).

Sensitivity analysis
Univariate sensitivity analyses were carried out to investigate the robustness of the study results. The variables examined were the cost of production and administrative processes, the cost of retrieving flags, who activated the flags, and the cost and number of additional attendances.

Estimated benefits used in the economic analysis
See the 'Effectiveness Results' section.

Cost results
The total cost of the intervention for an average practice of 89 eligible women was 113 (51% borne by the practice) for the letter, 160 (78% borne by the practice) for the flag, and 274 (67% borne by the practice) for the combined letter and flag intervention.

Synthesis of costs and benefits
The extra total health service cost per additional attendance was 35 for the letter and 65 for the flag. The estimated costs per attendance were robust to variations performed in the sensitivity analyses.

Authors’ conclusions
The letter was the most cost-effective intervention, while the flag was of equivocal cost-effectiveness.

CRD COMMENTARY - Selection of comparators
The rationale for the selection of the comparator was clear. No intervention was selected since the aim of the study was to assess the active value of the interventions, which were chosen on the basis of prior studies. You should assess which intervention is currently implemented in your own setting.

Validity of estimate of measure of effectiveness
The effectiveness analysis used a randomised, controlled clinical trial, which was carried out in several centres.
Several statistical analyses were carried out on the study sample. The study sample appears to have been representative of the study population. The authors commented that the internal validity of the study was enhanced by the comparability of the study groups at baseline, and by the complete determination of the outcome. In addition, the analysis was carried out on an intention to treat basis. It was also noted that the equivocal effectiveness of flags may be due to the fact that this intervention relied on women consulting the practice during the study period (6 months). "Particularly if computerised, flags could be in place for longer and so provide greater opportunity for activation."

**Validity of estimate of measure of benefit**
The benefit measure was derived from the effectiveness analysis. It appears to have been appropriate in assessing the success of the intervention.

**Validity of estimate of costs**
The study was conducted from the perspective of the NHS. All the relevant categories of costs were included in the analysis. Since the interventions proved to have no impact on the consultation rates, the number of consultations was not included in the economic analysis. This omission is unlikely to have affected the study results. Power calculations were carried out in the cost analysis, as economic data were derived from a sub-sample of patients enrolled in the trial. However, the costs and the quantities were not reported separately, thus reducing transparency and the ease of assessing generalisability. The costs were treated deterministically.

**Other issues**
The authors compared their findings with those from published studies. Also, the issue of the generalisability of the study results to other settings was addressed. The authors stated that "the generalisability of the trial findings is sustained by the similarity of practices participating in this trial with those eligible but not participating, particularly if the practice sampling procedure is considered". Sensitivity analyses on the costing were also carried out. Women who had failed to attend a recent appointment for routine third-round breast screening were enrolled in the study and this was reflected in the study conclusions. The effectiveness results were reported in full, whereas the cost results were not.

**Implications of the study**
The authors suggest that the policy of sending letters to recent non-attenders should be adopted to encourage subsequent attendance. Further research should focus on the design of the letter, both in general and with respect to languages and translation sheets.

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**Other publications of related interest**
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