Effectiveness and cost-effectiveness of multiple outcalls to promote mammography among low-income women

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 a multiple outcall approach, in which women received not just one but a total of five telephone calls promoting screening mammography.

Type of intervention
Secondary prevention.

Economic study type
Cost-effectiveness analysis.

Study population
The study population comprised low-income women aged 50 years or older. The inclusion criteria specified that the women spoke English, had not had breast cancer, and had no current symptoms of breast cancer.

Setting
The setting was community care. The economic analysis was carried out in Colorado, USA.

Dates to which data relate
The effectiveness and resources data were collected between 1994 and 1996. The price year was 1994.

Source of effectiveness data
The effectiveness data were derived from a study conducted by the authors and published in 1998 (see Other Publications of Related Interest).

Link between effectiveness and cost data
The costing was carried out using the same sample of patients as that used in the effectiveness study.

Study sample
No power calculations to determine the sample size were reported. The details of sampling and recruitment for the control and single outcall groups were reported elsewhere (Crane et al., see Other Publications of Related Interest). In brief, households from low-income and minority neighbourhoods throughout Colorado were randomly assigned to the control group, the single outcall group or the advance card plus single outcall group. Women were recruited over the phone. Forty-eight per cent of households reported no eligible women. A total of 3,080 women were recruited and assigned to one of the three groups. The number of women in each group was not reported.
For the multiple outcall study, the participants were recruited on-site from stores in low-income and/or minority neighbourhoods throughout Colorado. Of 2,667 women approached by two health educators to be part of the multiple outcall study, 34.3% refused (mostly "too busy"), 24.1% were ineligible, and 41.6% (1,111) were enrolled and completed a written consent statement. Of the 1,111 women enrolled, 983 (88.5%) completed the initial outcall. These women were compared with the 3,080 women recruited by telephone. The response rate to the 6-month follow-up interview was 80% (n=783) for the multiple outcall group and 75% (n=2,212) for the other groups (n=695 in the control group, n=746 in the single outcall group, n=771 in the advance card plus single outcall group).

**Study design**
The study was a comparative study with a historical control, which was conducted in a single centre (Crane et al., see Other Publications of Related Interest). Outcalls for the single outcall study were conducted from August 1994 to June 1995, whereas outcalls for the multiple study were conducted from September 1995 to July 1996. The duration of the follow-up was 6 months after enrolment into the study.

**Analysis of effectiveness**
The basis of the analysis of the clinical study was treatment completers only. The primary health outcomes used in the analysis were the mammography adherence status (baseline and 6-month follow-up), the stage of change (6-month follow-up) and the decisional balance. Past mammography behaviour and future intentions were combined to define the stage according to the Transtheoretical Model as described by Rakowski et al. (see Other Publications of Related Interest). The five stages defined were precontemplation, contemplation, action, maintenance and relapse. A decision balance scale with 13 items was administered over the telephone at the 6-month follow-up. The scores could range from 13 (an "antimammography" stance) to 39 (a "promammography" stance). The patients were not comparable at baseline. Women in the multiple outcalls group were younger, more highly educated, had higher income, had slightly higher self-reported health status and were more adherent to mammography screening guidelines at baseline.

**Effectiveness results**
There was no significant difference among women who were adherent to mammography at baseline in mammogram realisation during the follow-up. However, among the nonadherent women, significantly more women in the multiple outcall group reported having had a mammogram at follow-up (27%), compared with the other groups (11 - 16%), (p<0.001).

Among women nonadherent at baseline in the multiple outcall group, those who received more than one call were significantly more likely to be adherent at follow-up than those who received only one call (36.8% versus 11.4%, p<0.001).

The demographic variables for which the groups differed at baseline appear to have had little or no relationship to adherence at follow-up.

There was a statistically significant trend in the stage of change at follow-up for women nonadherent at baseline, (p<0.001). This indicated that, as the intensity of the intervention increased, fewer women were in precontemplation and relapse and more women were in contemplation, action and maintenance.

For each comparison in baseline adherence status (all, adherent and nonadherent), the multiple outcall group had significantly higher mean decision balance scores. This indicated a greater acceptance of the benefits of mammography, (p<0.001).

**Clinical conclusions**
The multiple outcall approach appears to have been an effective method of promoting mammography among women who had been nonadherent.
Measure of benefits used in the economic analysis
The measure of benefits was the number of women who changed behaviour stage at the 6-month follow-up.

Direct costs
The perspective adopted was not reported. The costs associated with the intervention delivery were for personnel (using the computer-recorded time for delivering the intervention over the phone) and printing and postage (for the advance card group only). The personnel costs used the nationwide average hourly wage of CIS telephone information specialists in 1994, plus a fringe benefits rate of 26% and an overhead/indirect cost rate of 45%. The printing and postage costs were actual per-item costs. The costs and the quantities were reported separately. Discounting was unnecessary since the costs were incurred during less than one year. The costs of the programme were calculated for two baseline nonadherent rates (40 and 100%) in a population of 1,000 participants.

Statistical analysis of costs
No statistical analysis of the costs was carried out.

Indirect Costs
The authors included personnel costs within which an overhead/indirect cost rate of 45% was incorporated.

Currency
US dollars ($).

Sensitivity analysis
No sensitivity analysis was performed.

Estimated benefits used in the economic analysis
When 40% of the population (1,000 participants) was nonadherent at baseline, the number changed to adherent out of 1,000 participants was 20 in the single outcall group, 17.6 in the advance card plus single outcall, and 65.6 in the multiple outcall group.

When 100% of the population was nonadherent at baseline, the number changed to adherent out of 1,000 participants was 50 in the single outcall group, 44 in the advance card plus single outcall, and 164 in the multiple outcall group.

Cost results
When 40% of the population was nonadherent at baseline, the costs of delivering the programme to 1,000 participants were $5,728 for the single outcall intervention, $6,868 for the advance card plus single outcall intervention, and $10,088 for the multiple outcall intervention.

When 100% of the population was nonadherent at baseline, the costs of delivering the programme to 1,000 participants were $6,560 for the single outcall intervention, $7,780 for the advance card plus single outcall intervention, and $14,840 for the multiple outcall intervention.

Synthesis of costs and benefits
When 40% of the population was nonadherent at baseline, the cost per woman converted to adherence was $288 for the single outcall intervention, $390 for the advance card plus single outcall intervention, and $154 for the multiple outcall intervention.

When 100% of the population was nonadherent at baseline, the cost per woman converted to adherence was $131 for...
the single outcall intervention, $177 for the advance card plus single outcall intervention, and $90 for the multiple outcall intervention.

**Authors' conclusions**
The multiple outcall intervention was consistently the most cost-effective intervention of the three studied.

**CRD COMMENTARY - Selection of comparators**
The choice of the comparators was clear. The comparators were chosen because they represented alternative technologies to encourage mammography behaviour, or no intervention. You should consider whether these are widely used technologies in your own setting.

**Validity of estimate of measure of effectiveness**
The authors reported that the study was a "quasi-experimental" design that included many biases in the method of recruitment and in the delivery of the interventions between the single and multiple outcall groups (time lag and personal contact in the multiple outcall group). Consequently, the patients were not comparable at baseline and the efficacy of multiple outcall intervention may have been increased due to the biases present. The study design was clearly not appropriate for the study question. However, given the circumstances, the authors made good use of the available evidence. The authors also acknowledged the limitations in their study design and gave some justification for the choices made. As specialists or health educators delivered the interventions, the apparent effect of the multiple outcall intervention may be attributable to the difference in delivery of the interventions.

**Validity of estimate of measure of benefit**
The estimates of the benefits were obtained directly from the effectiveness analysis. The choice of estimate was justified.

**Validity of estimate of costs**
The perspective adopted was not reported and, as such, it is difficult to ascertain whether all the relevant costs were included. The authors justified their exclusion of the training and recruitment costs. The costs and the quantities were reported separately, which will aid the reproducibility of the results obtained. No statistical analysis of the costs was performed. Discounting was unnecessary since all of the costs were incurred during 6 months. The price year was reported, which will aid future reflation exercises.

**Other issues**
The generalisability of the results was not discussed. However, comparisons were made with studies dealing with the same topic. The study enrolled low-income women and this was reflected in the authors' conclusions. The authors highlighted the limitations of their study. They do not appear to have reported their results selectively. The main limitation of the study was the study design and, consequently, the potential biases in the findings.

**Implications of the study**
The results suggested that a combined approach, in which nonadherent women receive multiple calls promoting screening behaviour then receive single calls at appropriate intervals to promote repeat screening, may be a useful strategy in a defined population. More attention should be paid to the question of what strategies should be used to promote initial cancer screening, as well as to maintain the behaviour over time.

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Bibliographic details

Other publications of related interest


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MeSH
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