The effectiveness of mailed patient reminders on mammography screening: a meta-analysis

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Authors' objectives
To compare the effectiveness of mailed patient reminders at increasing mammography screening.

Searching
The following electronic databases were searched: MEDLINE (1985-Sept 1996), Current Contents (1/7/89-25/9/96), Magazine & Journal Articles Database (1/1/88-28/9/96), PsycINFO (1/1/67-30/11/96) and ABI/Inform (1/1/71-19/9/96). The search terms included the following MeSH terms and keywords: 'information systems', 'breast cancer', 'reminder systems', 'clinical trials', 'patient education' and 'computer'. In addition, the bibliographies of retrieved articles were checked for additional studies.

Study selection
Study designs of evaluations included in the review
Published randomised controlled trials (RCTs).

Specific interventions included in the review
Tailored or generic reminders for mammography screening mailed to patients. Interventions combining mailed reminders with other components were also included. Most of the studies compared reminders to no-reminder/usual care controls; however, some compared tailored reminders to generic reminders. Telephone calls from outreach workers and other non-mailed reminders were excluded.

Reference standard test against which the new test was compared
The review did not include any diagnostic accuracy studies that compared the performance of the index test with a reference standard of diagnosis.

Participants included in the review
Women who participated in mammography screening programmes for breast cancer. No further inclusion criteria were reported for participants. The screening status of the women included in the review was not clear (i.e. up to date, due or overdue for screening).

Outcomes assessed in the review
Attendance for screening, costs, and patient-related variables associated with screening attendance (including age, race, income, education etc.).

How were decisions on the relevance of primary studies made?
The author does not state how the papers were selected for the review, or how many of the reviewers performed the selection.

Assessment of study quality
The author does not state that they assessed validity.

Data extraction
Data concerning sample characteristics and outcomes were extracted. Not stated how the extraction process was carried out i.e. how many reviewers were involved, whether standardised extraction forms were used.

Methods of synthesis
How were the studies combined?
The studies were combined according to the location of the study (USA or all other locations) and the type of control group (reminder vs no reminder or tailored reminder vs generic reminder). Pooled odds ratios (ORs) and P values were reported.

How were differences between studies investigated?
Chi-squared tests were performed and the Woolf test used to assess the level of interaction between studies. Sensitivity analyses were performed to assess the effects of including studies that compared multiple interventions against the same control group. These studies were eliminated from the pooled analyses one at a time and their influence determined by observing the percentage change in the pooled ORs.

Results of the review
Sixteen RCTs including 8401 intervention participants and 7957 control participants.

Reminder vs no reminder:
US studies (n=11) - Women who received reminders were significantly more likely to attend than those who did not (OR=1.48, P<0.001).

Non-US studies (n=2) - Women who received reminders were significantly more likely to attend than those who did not (OR=5.57, P<0.001).

Tailored reminder vs generic reminder:
US studies (n=3) - Women receiving tailored reminders were significantly more likely to attend than those who received generic reminders (OR=1.87, P<0.05).

Non-US studies (n=2) - Studies outside the US were not pooled as the Woolf test indicated significant differences between the studies. In general however, the studies found that reminders with appointment times were more effective.

Other factors associated with screening:
Reporting of other factors associated with screening attendance were inconsistent and in the majority of cases there was insufficient data to determine which factors were important. However, variables related to perceived health risk including health status, family history and previous mammography appeared to be associated with screening.

Sensitivity analyses:
Sequentially removing each study indicated that four studies changed the OR by more than 10%. The most influential of the studies had a large sample size and when removed the OR for studies conducted outside the US changed from 4.08 to 1.68. However, the effect still remained statistically significant (P<0.05), as was the case with the removal of any of the studies.

Cost information
All cost data were converted into 1995 US dollars. Two US studies and one Australian study reported data on costs, however the data were not dated and so direct comparisons were difficult. Nevertheless estimates of cost per woman screened ranged from $0.96US to $5.88US. Reminders with appointments although more effective, were not as cost-effective (reminder+appointment=$6.13US/woman and $18.29US/woman screened vs reminder only=$1.68US/woman and $16.25US/woman screened). For a full discussion of the economic aspects of this study see NHS EED record 21998000314.

Authors' conclusions
Patient reminders are effective at increasing mammography screening.
CRD commentary

This review assesses both the effectiveness and cost-effectiveness of mailed reminders for mammography screening using RCTs. Only studies from the highest level of the design hierarchy (RCTs) were used, however the validity of individual RCTs was not assessed. In addition only published studies were included in the review and so the review findings may be subject to the effects of publication bias. Details of the review methodology were also lacking in particular details of how studies were selected and the data extracted for review. The level of heterogeneity between studies was assessed and differences in the US/non-US healthcare systems considered before deciding which studies to combine. Sensitivity analyses were also carried out to assess the robustness of the findings. Taking these factors into account it would appear that the author's findings are supported by the data presented.

Implications of the review for practice and research

Practice: The author states 'primary care providers should consider instituting a patient-orientated reminder system to increase the initiation and maintenance of annual mammography for their patients 40 years of age and older'.

Research: The author states 'more research is needed to assess the cost-effectiveness of patient reminders, and their effectiveness across race, education, income and type of insurance'.

Also, 'in future research, it will be important to understand how patients perceive and use this information (in mailed reminders) in their decision-making process'.

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the reliability of the review and the conclusions drawn.