Acceptor and rejectors of an invitation to undergo breast screening compared with those who referred themselves

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SUMMARY  All women aged 50–79 were invited by two group practices to undergo screening and 57% accepted. Women of the same age range in other practices, who referred themselves, were also screened. Interviews with random samples of 100 invited screened women (acceptors), 100 invited unscreened women (rejectors), and 50 self-referred women enabled comparisons to be made of personal and social characteristics, previous health behaviour, and beliefs about cancer in the three groups. Self-referral was associated with lower age, higher social class, and higher educational levels. Women accepting invitations included more who had previously used other screening procedures, for example, cervical smears and chest x rays, than those rejecting invitations. Previous use of screening was even more marked among self-referred women. Acceptance of screening was associated with belief in the possibilities of curing cancer.

Because no programme of presymptomatic screening can be effective if members of the target population do not undergo the screening procedure, there has been considerable interest in factors affecting the use made by individuals of various procedures. Much of the research has concentrated on social and psychological factors underlying disinclination to submit to screening procedures and relatively little attention has been paid to the effects of different approaches to invitation, or to the mechanisms by which an individual negotiates the screening appointment. In this paper we report a comparison between women who accepted and women who rejected a specific invitation and appointment to attend a breast cancer screening clinic. Comparison is also made with a group of women who had not been invited but who sought the screening examination on their own initiative.

Women aged between 50 and 79 years registered with two group practices in a residential urban area were invited to attend a clinic based at a teaching general hospital in the area. The invitations offered a provisional appointment to attend the clinic with an opportunity to alter the time or date to suit the women. The letter of invitation included educational material carrying two main 'messages': that cancer of the breast is curable when detected early and that although most 'lumps' in the breast are not due to cancer, it is wise to have them investigated to 'make sure'.

Women who did not attend following the initial invitation were sent a second similar letter. Overall, 57.3% of the invitations led eventually to an attendance at the screening clinic.

Methods

A sample of the acceptors was obtained using a table of random numbers to select 100 women from the serially numbered invited attenders at the screening clinic. A similarly selected sample was drawn from self-referred attenders. None refused interview in
either of these groups. The sample of rejectors was more complicated. Initially a sample was drawn from those who had been sent an invitation and had not attended. However, it was discovered that a number of them were no longer living at the recorded address and it seems almost certain that they had not received their invitations. We have therefore not regarded these women as part of the rejector population. A further nine proved impossible to contact at the recorded address in spite of repeated visits. It is probable that they did not receive their invitations and should not be regarded as part of the rejector population. One had died between the date of the invitation and that of drawing the sample. Sampling by random numbers was continued until 100 had been interviewed, at which point 25 had refused and one was too deaf to be interviewed. The interviewed sample of rejectors therefore probably represents 100 out of 126 of those eligible and sampled (79-4%).

The interviews were conducted by one of us (P.H.) and involved a number of questions relating to attitudes to cancer and its curability, to the previous use of screening procedures, and to a number of other general matters relating to education, occupation, and attitudes to health.

Results

(1) PERSONAL CHARACTERISTICS
Acceptors and rejectors differed somewhat in age distribution but resembled each other much more closely than they resembled the self-referred group (Table 1). Although rejectors were older than acceptors the self-referred group was very much younger, containing very few women over the age of 60 and very few indeed over 70. The proportions of those not employed outside the home were also relatively similar for rejectors (68%) and acceptors (59%), but markedly different for the self-referred (30%). There was a similarly moderate difference in social class between acceptors and rejectors, but a marked difference in the case of the self-referred (Table 2).

(2) PREVIOUS HEALTH BEHAVIOUR
The interview contained questions on the previous use of other screening procedures—focusing particularly on cervical cytological screening, chest x ray, and dental checks. When inquiring about cervical and chest screening the questions sought to differentiate between take-up of the procedures on the client’s initiative and a more passive acceptance of screening offered in the context of other medical care or as an employment requirement.

Table 1 Age distribution of invitees, acceptors, and self-referred

<table>
<thead>
<tr>
<th>Age group (years)</th>
<th>Invites</th>
<th>Acceptors</th>
<th>Self-referred</th>
</tr>
</thead>
<tbody>
<tr>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>50-59</td>
<td>1183</td>
<td>42.7</td>
<td>756</td>
</tr>
<tr>
<td>60-69</td>
<td>1216</td>
<td>43.9</td>
<td>671</td>
</tr>
<tr>
<td>70-79</td>
<td>369</td>
<td>13.3</td>
<td>160</td>
</tr>
<tr>
<td>Total</td>
<td>2768</td>
<td>99.9</td>
<td>1587</td>
</tr>
</tbody>
</table>

Acceptors/rejectors $\chi^2 = 52.64$ df = 2 P < 0.001
Acceptors/self-referred $\chi^2 = 137.7$ df = 2 P < 0.001

Table 2 Social class distribution of rejectors, acceptors, and self-referred (married women classified by their husbands' occupations)

<table>
<thead>
<tr>
<th>Social Class</th>
<th>Rejectors</th>
<th>Acceptors</th>
<th>Self-referred</th>
</tr>
</thead>
<tbody>
<tr>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>Upper (I, II, III a)</td>
<td>28</td>
<td>30.8</td>
<td>33</td>
</tr>
<tr>
<td>Middle (III b)</td>
<td>35</td>
<td>38.5</td>
<td>36</td>
</tr>
<tr>
<td>Lower (IV, V)</td>
<td>28</td>
<td>30.8</td>
<td>21</td>
</tr>
<tr>
<td>Totals</td>
<td>91</td>
<td>100.1</td>
<td>90</td>
</tr>
</tbody>
</table>

Acceptors/rejectors $\chi^2 = 1.40$ NS
All groups $\chi^2 = 16.87$ df = 4 P < 0.005
These data are from the samples interviewed.
Acceptors and rejectors of an invitation to undergo breast screening

Table 3 Previous use of cervical cytology test related to use of breast cancer screening

<table>
<thead>
<tr>
<th>Use of cervical test</th>
<th>Rejectors n = 100</th>
<th>Acceptors n = 100</th>
<th>Self-referred n = 50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active seeking of test</td>
<td>12%</td>
<td>29%</td>
<td>88%</td>
</tr>
<tr>
<td>Passive acceptance of test</td>
<td>11%</td>
<td>12%</td>
<td>2%</td>
</tr>
<tr>
<td>Never tested</td>
<td>77%</td>
<td>59%</td>
<td>10%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Rejectors/acceptors $X^2 = 9.46$  df = 2  $P < 0.01$
All groups (combining passive and never) $X^2 = 87.66$  df = 2  $P < 0.001$

Table 4 Previous use of chest x ray screening related to use of breast cancer screening

<table>
<thead>
<tr>
<th>Use of chest x ray screening</th>
<th>Rejectors n = 100</th>
<th>Acceptors n = 100</th>
<th>Self-referred n = 50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active seeking of screening</td>
<td>20%</td>
<td>38%</td>
<td>54%</td>
</tr>
<tr>
<td>Passive acceptance of screening</td>
<td>27%</td>
<td>24%</td>
<td>26%</td>
</tr>
<tr>
<td>Never screened</td>
<td>53%</td>
<td>38%</td>
<td>20%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Acceptors/rejectors $X^2 = 8.24$  df = 2  $P < 0.025$
All groups $X^2 = 21.64$  df = 4  $P < 0.001$

acceptors or rejectors of invitations. For both procedures acceptors were somewhat more likely than rejectors to have used the procedure and more likely to have taken an initiative in so doing. Nevertheless, the self-referred reported much higher levels of use and of initiative. Part of these differences may be attributable to the difference in age distribution of the three groups, because uptake of cervical cytology is markedly associated with age and uptake of chest x ray is to some extent associated. However, the differences remain when comparison is made within age groups (Table 5).

The use of dental checks was reported by 31% of rejectors, 35% of acceptors, and 76% of the self-referred.

(3) EXPERIENCE AND KNOWLEDGE OF BREAST DISEASE

Women were asked about previous breast disease and also about the experience of other members of the family and of friends. Thirteen per cent of both rejectors and acceptors reported a previous history of breast disease and 36% of the self-referred gave such a history.

In the case of family histories of breast cancer a somewhat similar picture emerged: 12% of both acceptors and rejectors reported such a history, and 18% of self-referred. These differences are not statistically significant. The level of benign breast disease reported was the same in all groups at 8%. Questioned about whether they had heard of breast cancer in people not known to them personally, 46% of rejectors, 35% of acceptors, and 50% of the self-referred replied positively.

Asked what they thought was the commonest cause of death in this country, just over a third (36.5%) of both acceptors and rejectors said cancer: only 18% of the self-referred thought this. Asked about the curability of cancer, 37% of rejectors, 17% of acceptors, but none of the self-referred thought it could never be cured. Spontaneous mention of the value of early treatment, for example, 'provided it's caught early', was least common among rejectors (28%) and most common among the self-referred (48%). Asked directly about the value of early treatment, 85% of rejectors, 93% of acceptors, and 98% of the self-referred thought that it could favourably influence the outcome.

Discussion

The three groups of women under consideration differed in a number of ways. Acceptors and rejectors of the invitations to undergo screening had received a personal communication from their own doctor implicitly commending the procedure and offering not only a specific appointment but also clear instructions on how to alter it if the appointment was inconvenient. The invitation had been repeated for non-responders. The self-referred were women who had heard of the existence of the clinic either through press publicity or in conversation, and who had taken steps to make an appointment and to attend for examination.

Table 5 Previous health behaviour and age: Proportions actively seeking screening

<table>
<thead>
<tr>
<th>Screening</th>
<th>Rejectors</th>
<th>Acceptors</th>
<th>Self-referred</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Age group (years)</td>
<td>50-59</td>
<td>60-79</td>
</tr>
<tr>
<td>Cervical cytology</td>
<td>25-8</td>
<td>5-8</td>
<td>50-0</td>
</tr>
<tr>
<td>Chest x ray</td>
<td>29-0</td>
<td>15-9</td>
<td>43-2</td>
</tr>
</tbody>
</table>

200 invited women/age: cervical cytology $X^2 = 32.39$  df = 2  $P < 0.001$
200 invited women/age: chest x ray $X^2 = 10.68$  df = 2  $P < 0.005$
Clearly, the latter group had considerable motivation, and the evidence is that such motivation is more marked among the young and the better educated, as well as among those whose personal experience and beliefs have identified breast disease as an important but tractable problem.

Those who were invited to attend were a reasonably representative sample of the general target population, being the entire practice population of the relevant age and sex in two typical practices in the study area. The invitation brought a response from women who were much more representative of the target population than the self-referred group. It seems reasonable to conclude that specific invitation results in a more representative coverage of the target population than would be obtained by reliance on self-referral.

It is somewhat disappointing that the invitation achieved a small overall response, but not surprising. There was no educational or publicity campaign to prepare the way for the letter and the two health education messages were incorporated in the text of the letter with no visual emphasis of any kind.

The association of both response to invitation and self-referral with a past history of having used other screening procedures suggests that attitudes to screening are fairly consistently maintained over a period of time and in relation to several different procedures. However, the differences between acceptors and the self-referred are encouraging in that they suggest that specific invitations bring in a worthwhile proportion of clients who might not otherwise have used the service.

The response to direct questioning about the value of early treatment for cancer represents a generally high level of confidence. Other investigators using an identical question in public opinion surveys have found lower levels of confidence.2-5 The very high level of confidence in the value of early treatment found among the self-referred suggests that such confidence is an important element in prompting self-referral.

It does not seem unreasonable to conclude that a much greater coverage of the target population could be achieved by health education designed to promote a more widespread belief in the value of early treatment, and by a system of specific invitations and appointments for screening—preferably through the personal medium of general practitioners.

We thank the Department of Health and Social Security for the grant that made this work possible and for advice and support throughout the project. We also thank Drs. Blumfield and McShane and their colleagues in general practice; the surgeons, radiologists, nurses, radiographers, and secretaries in the breast clinic; and the staff of the regional computer centre.

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References

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P Hobbs, A Smith, W D George and R A Sellwood

*J Epidemiol Community Health* 1980 34: 19-22
doi: 10.1136/jech.34.1.19

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