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Cervical screening: the optimum visit plan for contacting users and non-users in Scotland

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Abstract

Objective **– To investigate the numbers of visits required to obtain interviews with users and non-users of cervical screening, and to determine the workload involved to enable an optimum visit plan to be developed.**

Design **– Case-control study of users and non-users of cervical screening using a flexible visit plan that involved up to eight attempts at contact. Visits were made in mornings, afternoons, and evenings, the visit pattern being determined by information gained from local sources.**

Patients **– Altogether 660 non-users of cervical screening (cases), aged 20–64 and registered with 23 randomly selected general practitioners (GPs), were identified from the Tayside computerised register of cervical smears. These women were selected from the computerised lists of 18 GPs in Dundee and five in Perth. A total of 417 women recorded as having a smear within the previous three years (controls), matched by age and GP, were also identified from the computerised register.**

Results **– Altogether 1834 attempts were made to contact the cases, of whom 339 were interviewed, giving a workload of 18 interviews per 100 attempts. For the controls 1359 attempts were made at contact to yield 339 interviews, a workload of 25 interviews per 100 attempts. Refusals (19%) and incorrect addresses (23%) were the two major reasons for failing to achieve interview. Only for four (0·6%) of the cases and one (0·2%) of the controls was no information gained. The proportion of attempts which led to interview remained constant with increasing numbers of callbacks (up to six for the cases and eight for the controls).**

Conclusions **– A flexible approach to visit scheduling that takes account of local knowledge can lead to interviews with 66% of non-users of health screening, when incorrect addresses are removed. It is preferable to plan for many (up to six) visits to achieve interview. This will minimise non-response bias without increasing the workload per successful interview.**

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Health promotion and disease prevention have been brought to prominence by the 1990 contract for general practitioners (GPs) in the UK.[1] Screening for occult disease among apparently healthy patients will form a major part of these activities. Screening for cervical cancer has been underway for over 30 years,[2] and that for breast cancer has recently been introduced. It has been suggested that mass screening programmes could also be developed for hypertension, hyperlipidaemia, obesity, smoking, and alcohol consumption.[3] One of the major concerns of screening programmes is with those who do not participate; several studies have been undertaken into the characteristics of non-users of cervical[4–8] and breast cancer screening.[9 10] As would be expected, non-users are difficult to contact, with as few as 34% being interviewed.[6]

Concern about failure to attend is likely to increase as the screening programmes for other diseases are implemented and this will probably stimulate studies into the reasons for non-attendance and the changes required to increase uptake. One concern common to all will be the best ways to contact non-users and how much effort should be expended in attempting to contact them. We report on the success of an intensive study to establish contact with a large number of non-users of cervical screening and on the cost, in terms of the number of attempts required, of establishing contact.

Methods

CERVICAL SCREENING IN TAYSIDE

Data on all women screened for cervical cancer in Tayside have been recorded in a computer system since 1964. A programme calling all eligible women aged between 20 and 60 years with no record of a smear test was begun in 1987 and completed in 1989. The programme uses a computerised register of all women based on the community health index and has been described elsewhere.[11] It allows for up to three letters of invitation, and as at 1991 some 85% of the target population had been screened.[12]

CASES AND CONTROLS

Cases were women listed on the computer system as never having had a cervical smear. They were aged 20–64 years at the start of the study, but not more than 60 years of age at the time of the last invitation to attend for screening. They were selected from the lists of 23 randomly selected GPs in the two cities in Tayside, 18 of whom had practices in Dundee and five in Perth. A maximum of 32 women was taken from each GP's list; when more than this were registered, 32 were obtained by random sampling. Controls were women who had had a smear within the previous three

Table 1 Outcome of up to eight attempts at contact with users and non-users of cervical screening

	Cases	Controls
Interviewed:	339 (51%)	339 (81%)
Successful	307	339
Hysterectomy	5	0
Established attenders	27	0
Not interviewed:	168 (25%)	36 (9%)
Illness	16	5
No English	2	0
Refusal	113	16
Broken appointment	14	7
Temporarily away	10	1
Inaccessible	13	7
Errors in the computerised register:	149 (23%)	41 (10%)
Defunct address	8	0
Moved out of area	47	14
Moved, not known where	28	13
Moved from student halls	6	0
Not known at address	59	14
Established male	1	0
No information:	4	1
Total	660	417

years, and were individually matched to the cases by GP and age (within five years). The study was granted ethical approval by the Tayside Committee on Medical Ethics.

PATTERN OF VISITS

The women were sent a letter from their GP requesting their cooperation in the study. The letter informed them that a nurse would contact them shortly to ask their views on cervical screening. It provided a telephone number by which the women could arrange a specific interview time, or request that no visit be made. Up to eight attempts were made to contact each woman who did not request *not* to be visited. Local knowledge about the location of the women and the best times for contact was sought from several sources of whom the practice staff, neighbours, caretakers, and relatives were the most helpful. The purpose of the study was not revealed to third parties during these enquiries, although relatives were told, if they enquired, that a survey on screening services was being carried out. The visits were made at varying times of day and days of the week, the sequence largely determined by the knowledge gained. Few visits were attempted at weekends.

Results

Attempts were made to contact 660 women listed on the computer system as never having had a smear (cases), of whom 339 (51%) were interviewed. The interviews revealed that five women were ineligible for a smear because of a hysterectomy, and 27 reported having had a recent smear in another area. One man was incorrectly listed as a woman. The reasons for not achieving an interview are listed in table 1; the most common was direct refusal, with illness being next most common. Thirteen women were classified as inaccessible; local knowledge confirmed that they lived at the stated address but contact with them was never achieved. Errors in the computerised register accounted for failure in 23% of the women, and in only four cases did it prove impossible to allocate a woman to one of the outcome categories.

Control women, registered as having had a smear within the past three years, were much easier to contact and 81% of those approached were interviewed. The principal differences from the cases were the much lower rates of refusal and of errors in the computerised register. Thirty one of the cases and 21 controls who were interviewed had incorrect addresses in the computerised register, but through local knowledge, the women were traced to their new addresses.

To achieve the interviews, a total of 1834 attempts were made to contact the cases and 1359 for the controls, giving a workload of 18 and 25 interviews per 100 attempts respectively. The interviews did not always take place at first contact; 247 of the visits to the cases and 196 of those to the controls were made after first contact (these numbers include the extra visits to those in whom the final outcome was a broken appointment or refusal). Following up women for interview once agreement had been obtained was clearly worthwhile as this yielded 62 interviews per 100 attempts for the cases and 86 per 100 attempts for the controls. Because establishing contact is the key event in surveys, the rest of this paper will focus on the number of visits till contact.

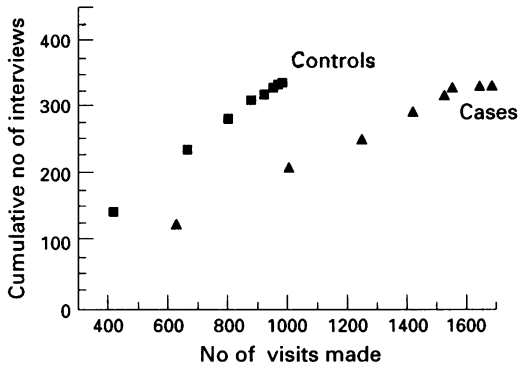
The numbers of visits required to establish contact or to assign cases and controls to one of the non-interview categories in table 1, is shown in table 2. Thirty four women received no visit, either because they requested this or the invitation letters were returned by the Post Office. Seventy four per cent of cases were resolved within three visits, compared with 82% of controls. Visits where contact led to interview were spread throughout the day; 108 in the morning, 117 in the afternoon, and 114 in the evening. Evening visits were usually attempted after daytime ones had been unsuccessful, unless local knowledge suggested otherwise. Thus, evening visits were often made later in the visit sequence; for example they accounted for only 20% of the first and second visits to cases, but made up 56% of visits four to eight.

The pattern of visits which led to interview is similar to that for contact; for example 75%

Table 2 Number of visits needed until resolution in users and non-users of cervical screening*

	Visit no									
	0	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*All*
Cases resolved % (no)	5 (34)	38 (251)	21 (130)	11 (73)	10 (64)	6 (40)	2·4 (16)	1·8 (12)	6 (40)	660
Controls resolved % (no)	0 (0)	41 (171)	27 (112)	14 (59)	7 (31)	3·4 (14)	2·9 (12)	1·7 (7)	2·6 (11)	417

* That is, contact made or the woman allocated to one of the non-interview outcome categories listed in table 1.



Recruitment of cases and controls in relation to the cumulative numbers of visits.

of case interviews and 82% of those for controls were obtained after three attempts, and visits six to eight yielded only 4% of case interviews and 5% of control. However, the inference that more than three of four visits is not cost effective cannot be drawn because no account has been taken of the workload involved in obtaining the interviews. The figure presents the relationship between the cumulative workload (that is, visits made) and the cumulative number of contacts which led to interview. The data points fall naturally in visit order. For the controls the number of successful contacts rises linearly with the total number of visits, indicating that each additional attempt has an equal chance of yielding an interview, irrespective of visit number. Among the cases, recruitment initially increases linearly, although less steeply than for the controls, but flattens off after the sixth visit.

Discussion

This study succeeded in contacting a very high proportion of the women drawn from the computerised register: when errors in the computer register are excluded, interviews were obtained with 66% of the cases and 90% of the controls. The lower proportion of interviews among the cases was expected, as these women have resisted several invitations to attend for screening. Tayside has established an effective computerised system for inviting women and by 1991, 85% had been screened.[12] Thus, the non-users investigated in this study represent a small group highly resistant to screening.

To interview these women in the community, this study combined flexible visit scheduling, based on an active search for local knowledge, with an exhaustive programme involving up to eight attempts at contact. Only for four cases (0·6%) was no information gained, compared with 4% in other studies of non-users of cervical screening.[6 7] Local knowledge was also responsible for successful interview with 31 cases and 21 controls whose addresses were incorrectly registered. A limitation of this study is that because its primary concern was to achieve interview, it was not possible to quantify the contributions of the various sources of local knowledge and visit scheduling to the success of establishing contact.

Comparison of these findings with other studies is complicated by the high screening rate for cervical cancer achieved in this region. For example, although Elkind *et al*[7] interviewed 45% of non-users, this was in an area in which only an estimated 30% of the women had been screened. Nathoo interviewed 34% of non-users[6]; but this was in an area in which only 14% of the women had been screened, so that the non-attenders were broadly similar to the general population. One study reported an interview with 91% of non-users from a general practice in which 87% of women had been screened.[5] It differs from the other published studies in that no incorrect addresses were encountered, so the sampling frame may be unusual.

The workload for achieving contact which led to interview was 21 per 100 attempts for cases and 29 per 100 for controls. The important point is that the contact rate was constant over successive attempts up to six visits for cases, and eight for controls. Although previous studies have indicated that more than one call back visit was made, they have not given details of the numbers made, nor the yield from successive visits.

The need for several call back visits to minimise non-response is stressed in standard textbooks on survey sampling.[13 14] Recent research on non-response has focussed on the potential bias introduced by non-response, comparing sample estimates when few or many call back visits are made.[15 16] The questions of how many such visits should be made and what is the additional cost of making them, however, have not been addressed. Two early studies sampling from the general population[13 17] support our finding that up to eight additional calls continued to yield interviews, and that the success rate did not fall at the higher number of visits.

Inaccurate addresses have been identified as a major impediment to screening[3 18 19] and this study confirms previous reports of high levels of error among the non-users.[6 7] Again, the level of these errors will depend on the proportion of women in the region who have been screened: the higher the proportion screened, the greater the size of the apparent problem.

Refusals account for almost all the other women not interviewed: broken appointments may often be a form of refusal. The extent to which this number could be reduced is an open question. There is a fine line between diligence in attempting interview, and harassment of women who do not want to discuss these matters. In this study attempts were ceased as soon as there was an indication that distress might be caused by continuing. As screening for diseases becomes widespread there may be a need for discussion of the ethics of pursuing non-attenders.

Increasing the uptake of screening was not an aim of this study. It was felt that any attempt to encourage the women to attend might influence their responses to questions on reasons for non-attendance. However, we did check on the computerised register in May 1993 and found that 11% of the women had subsequently obtained a smear. Possibly, if we had sought to encourage attendance this percentage would have been higher.

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