Screening for breast cancer

Recommendations are costly and short sighted

EDITOR,—S Field and colleagues' recommendations for two view mammography, a shorter screening interval, double reading of films, training for staff, and a change in the density of the films are costly, short sighted proposals in human and economic terms.¹

They are an attempt to address the emerging inadequacies of a programme of dubious value in terms of the primary objective, which is to reduce morbidity and mortality from breast cancer for all women. Ciaran B J Woodman and colleagues' paper highlighting the increased occurrence of interval cancers (but excluding *in situ* disease)² coincides with Hakoma *et al*'s report suggesting that cancers detected by screening are less aggressive and that the reduction in mortality may therefore be less than expected.³

Distributive justice demands that before more money is poured into the NHS breast screening programme we should consider the wider public health implications.⁴ The current cost of the programme (£2m) is more than has been allocated (£1.2m) to the NHS research and development programme for new research. To cause further imbalance would be unjustifiable in the light of the main objective of reducing mortality from breast cancer.

Screening is presented as beneficial to 50-64 year old women: such women do not understand what they are agreeing to. Altogether 17.8% of resultant diagnoses are for non-invasive cancers. In the United Kingdom ductal carcinoma *in situ* the cost is £1541 per participant per year—six times the average cost of such trials per patient (£254) (J Houghton, meeting of British Oncological Association and British Oncology Data Managers Association, 9 November 1994). Yet three quarters of these women will not progress to an invasive cancer in their lifetime but nevertheless are labelled as having cancer and absorb costly resources. They are included in the mortality statistics but excluded from Woodman and colleagues' paper.

We should develop a total strategy for the deployment of scarce research resources to achieve the primary objective, not shore up one costly measure for detection. The NHS policy for research and development is that evidence for the effectiveness of interventions should be sought in trials⁵: it is time we rectified this omission for population screening and that consent, with provision of balanced information, was sought from all screened women.

HAZEL THORNTON

Lay member, Cochrane Breast Cancer Group

Rowhedge,
Colchester CO5 7EA

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2 Woodman CBJ, Threlfall AG, Boggis CRM, Prior P. Is the three year breast screening interval too long? Occurrence of interval cancers in NHS breast screening programme's north western region. *BMJ* 1995;310:224-6. (28 January.)

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Advice to authors

We prefer short letters that relate to a recently published article and we are unlikely to publish letters longer than 400 words and containing over five references. Letters may be shortened. Your letters should be typed with double spacing and include a word count. All authors need to sign the letter and provide one current appointment and address. We encourage you to declare any conflict of interest. Please enclose a stamped addressed envelope if you require an acknowledgment.

Incidence of interval cancer and detection rate of first screenings are inconsistent

EDITOR,—Ciaran B J Woodman and colleagues report the first data on interval cancers from the NHS breast screening programme.¹ They do not comment on a serious inconsistency between the incidence of interval cancers and the detection rate at first screening, which deserves attention before conclusions are drawn from the data.

The incidences in the first three years after screening are 31%, 52%, and 82% of the underlying incidence. This reduction in incidence after screening occurs because of the cancers that were detected by screening. In these three years the reduction is $(3 \times 100\%) - 31\% - 52\% - 82\% = 135\%$ of the yearly incidence. The steep increase in the incidence of interval cancer back to the underlying incidence suggests that the cumulative reduction in incidence will not be much higher than 135% in following years.

The reported detection rate at first screening is 5.9/1000 screens. Thus the number of cancers detected at first screening is 322% of the underlying incidence of 1.83/1000 woman years. Including ductal carcinoma *in situ* would reduce the ratio probably by no more than 4%. Thus the number of cancers detected at screening is much higher than the decrease in cancers diagnosed clinically after screening. This inconsistency does not occur in other studies of screening for breast cancer because either the rates of interval cancer are lower or the ratio of prevalence to incidence is lower.

Assuming that no problems with registration or other errors occurred, we can think of only two explanations. Firstly, the data on incidence for the years before screening underestimate the underlying incidence. The incidence of breast cancer tends to increase with time, and the underlying incidence among screened women may be higher than that among women who refuse screening. Secondly, clinical detection of breast cancer may have shifted toward earlier stages. Though little is known about distribution by stage of breast cancers detected clinically in Britain compared with other western European countries, it is generally assumed to be or to have been less favourable. The start of the screening programme may have increased awareness in women and doctors, resulting in earlier diagnosis—outside the screening programme as well as in it. We think that the data on interval cancers do not warrant a shortening of the screening interval from three to two years unless these issues are sufficiently clarified. We have shown, however, that the

marginal cost effectiveness of intensifying a good breast screening programme to intervals of two years is relatively low but that extending the upper age limit to over 65 may be more efficient.²

ROB BOER
Statistician-informatician

HARRY J DE KONING
Epidemiologist

GERRIT J VAN OORTMARSEN
Mathematician

PAUL J VAN DER MAAS
Professor of public health

Department of Public Health,
Erasmus University,
PO Box 1738,
3000 DR Rotterdam,
Netherlands

1 Woodman CBJ, Threlfall AG, Boggis CRM, Prior P. Is the three year breast screening interval too long? Occurrence of interval cancers in NHS breast screening programme's north western region. *BMJ* 1995;310:224-6. (28 January.)

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Maximise compliance as well as radiological sensitivity

EDITOR,—Ciaran B J Woodman and colleagues' paper reporting the high rate of interval cancers in the North Western Regional Health Authority¹ and the accompanying editorial² will help to increase awareness that successful breast screening has several facets. Two view mammography at the first screen is a simple and effective way of improving the yield at prevalence screens, thus reducing the potential for "false negative" interval cancers. One of the principles behind mammographic breast screening is that the earlier in the detectable preclinical phase that this (or any) modality can achieve detection the longer the delay before the rate of interval cancer approaches the underlying incidence. Unfortunately, reducing the period between screens is only a partial solution to one aspect of the problem. It can have no effect on high rates of interval cancer in the first two years after a negative screen.

Published results from the Edinburgh randomised breast screening trial provide evidence relevant to the current controversy over the British programme. Firstly, the rate of interval cancer, after four successive biennial screens, in trial women moving into the NHS programme was 9.1 per 10000 woman years at 23 months but had risen to 20.4 by 35 months, so that interval cancers expressed as a proportion of the control incidence increased to 67%.³ This value is intermediate between that for the two county study and that for the North Western region. Secondly, the proportional incidence of interval cancers in the first year after a negative screen fell from 28.1% after the prevalence screen to 16.6% after the second mammographic screen and stabilised at around 5% after later screens.⁴ This shows that results after the prevalence screen should not be extrapolated to subsequent screens.

Of much greater importance is the proposal mentioned in the editorial "to give radiologists additional training in the subtle mammographic signs."² Optimising radiological sensitivity is an essential prerequisite for identification early in the detectable preclinical phase, thus maximising treatment of invasive cancer at the smallest size

while the lymph nodes are not affected. This is the key to the eventual reduction in mortality. The rate of positive nodes in incidence screens in Edinburgh, where the films were read by non-radiologist doctors,³ was 10% higher than that in the Ostergotland component of the two county study. Differences in radiological sensitivity are probably major influences on all these issues. The current figures relating to size and nodal spread (unpublished) for the south east Scotland screening programme reflect an improved sensitivity.

The mortality in the study group after 10 years in the Edinburgh trial was between 14% and 21% lower than that in controls, depending on the precise definition of the end point.³ To achieve a reduction equivalent to or greater than this by the year 2000 in Britain is ambitious but will be best served by maximising compliance⁶ as well as radiological sensitivity. Mechanisms to promote these need urgent support.

T J ANDERSON
Reader, department of pathology

F E ALEXANDER
Senior lecturer, department of public health sciences

University of Edinburgh,
Medical School,
Edinburgh EH8 9AG

A E KIRKPATRICK
Director

Scottish Breast Screening Programme,
South East Scotland Division,
Edinburgh EH11 2JL

- 1 Woodman CBJ, Threlfall AG, Baggis CRM, Prior P. Is the three year breast screening interval too long? Occurrence of interval cancers in NHS breast screening programme's north western region. *BMJ* 1995;310:224-6. (28 January.)
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Informed consent may increase non-attendance rate

EDITOR,—The *Health of the Nation* aims at reducing deaths from breast cancer in women invited for screening by a quarter by 2000. This target is unlikely to be met as there are only five years to go; judging by the current rates of interval breast cancer, we are probably only half way to that target.¹ If there is any reduction in mortality from breast cancer by 2000 it is just as likely to be attributable to the improvements in treatment since the publication of the world overview on adjuvant systemic treatment in 1992.² So what remedial actions should be taken?

S Field and colleagues suggest that the United Kingdom Coordinating Committee on Cancer Research trial of the frequency of breast screening will identify the optimum interval between screens.³ This trial, however, compares only one year with three years. It is hard to believe that the one year interval will not improve on the results of the three years interval, but if we do not have enough trained professionals to implement even a two year interval how can we afford a one year interval?

The suggestion that general practitioners should coerce women into joining the programme makes me feel uncomfortable. The target for acceptance in the NHS screening programme was 70%, and this has more or less been reached in most centres. Yet Paul A Creighton suggests that there should be financial inducements for general practitioners to encourage women to come forward for screening

and that this encouragement should be based on "information and counselling."⁴ It has to be remembered that women who fail to accept an invitation could be doing so for rational reasons. In absolute terms less than 1% of women who are invited for screening will benefit from it, whereas a greater percentage will have to face the problems of false alarms, unnecessary surgery, unnecessary labelling as having cancer, and a lead time in the diagnosis of cancers whose natural course is unaffected by "earlier detection."⁵ In other words, true informed consent for an invitation to screening might reduce rather than increase acceptance.

The NHS breast cancer screening programme has undoubtedly raised standards in the diagnosis and management of this disease, but many tough questions remain to be answered. These questions should be addressed in scientific terms outside the political arena, and the unsolicited targets in the *Health of the Nation* that have been imposed on the medical profession should be treated with the scepticism they deserve.

M BAUM
Professor of surgery

Royal Marsden NHS Trust,
London SW3 6JJ

- 1 Woodman CBJ, Threlfall AG, Baggis CRM, Prior P. Is the three year breast screening interval too long? Occurrence of interval cancers in NHS breast screening programme's north western region. *BMJ* 1995;310:224-6. (28 January.)
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British women are being offered a cheap deal

EDITOR,—It was encouraging to read Ciaran B J Woodman and colleagues' paper on breast screening¹ and, in the national press, that the Department of Health is taking an interest in the results. Mammographic radiologists will recall with regret that the requirements for adequate breast screening were known to the committee that issued the recommendations for screening in 1986.² This committee, which was heavy on the department's accountants and light on radiologists (whose recommendations were ignored), came to the extraordinary conclusion that the screening should be carried out by one radiologist, that one radiographic view should be obtained, and that the screening should be done only every three years. All the evidence from the Continent was that two initial views, read by two radiologists, every year or at most every two years were required. The excuse for not responding to the evidence was cost effectiveness, which everyone recognised as a euphemism for "cheaper."

After the publication of the recommendations some of us complained loudly that British women were being offered a cheap deal. Unfortunately, we had no effect. It is to be hoped that the programme will now be corrected, and perhaps radiologists who know about screening will be consulted. The profession must make sure that this most shameful of the government's underfunding exercises is improved.

A F MACDONALD
Retired radiologist

Edinburgh EH3 6RA

- 1 Woodman CBJ, Threlfall AG, Baggis CRM, Prior P. Is the three year breast screening interval too long? Occurrence of interval cancers in NHS breast screening programme's north western region. *BMJ* 1995;310:224-6. (28 January.)
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Technicians could be trained to interpret screening mammograms

EDITOR,—S Field and colleagues' editorial on interval breast cancers implies a need to quadruple the amount of radiological time devoted to the interpretation of screening mammograms.¹ I am unclear why this job must be the exclusive role of radiologists. Cervical cytology screening is entrusted to supervised technicians, and the tasks seem to be similar. Use of technicians would free radiologists from the presumably tedious task of examining hundreds of similar films for the more rewarding jobs involving direct clinical contact, such as ultrasonography and needle aspiration of breast lumps. I wonder what radiologists think about this.

MICHAEL ROBERTSON
General practitioner

Abingdon,
Oxfordshire

- 1 Field S, Michell MJ, Wallis MGW, Wilson ARM. What should be done about interval breast cancers? *BMJ* 1995;310:203-4. (28 January.)

Diagnostic performance of radiographers can be improved

EDITOR,—A move to a two year screening interval would help reduce the rate of interval cancers noted in the NHS breast screening programme. S Field and colleagues argue, however, that this is prohibited, at least in part, by the limited numbers of trained radiologists able to interpret the additional mammograms that would be necessary.¹

One possible means of overcoming this shortage would be to employ radiographers who have received additional training in interpreting screening mammograms. This has previously been suggested as a way of developing the radiographers' role.² I have shown in another area—fracture radiographs in the accident department—that the diagnostic performance of radiographers can be improved provided they receive supplementary training.³ It has long been standard practice for cytological screening to be routinely undertaken by skilled medical laboratory scientific officers with rigorous quality assurance checks by pathologists. Similar models could, perhaps, be introduced into breast screening units employing skilled radiographers, with comparable quality assurance checks by radiologists.

The reduced cost of a programme in which radiographers figured more in the screening process would presumably offset the costs anticipated if the programme was undertaken by radiologists and might make a two year screening interval more feasible.

C F LOUGHRAN
Clinical director

East Cheshire NHS Trust,
Macclesfield District General Hospital,
Macclesfield SK10 3BL

- 1 Field S, Michell MJ, Wallis MGW, Wilson ARM. What should be done about interval breast cancers? *BMJ* 1995;310:203-4. (28 January.)
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Two views mean twice the dose of radiation

EDITOR,—In their paper on breast screening and interval cancers Ciaran B J Woodman and colleagues state that "interval cancers may occur as a result of the failure to detect an abnormality at the time of screening (false interval cancers) or may occur as a new event after a negative screen (true interval cancers)."¹ They do not seem to consider the possibility that the screening process itself may have sparked off some of these "new events." To