NHS
Cancer Screening Programmes

Building on experience

Breast Screening Programme
Annual Review 2002

Contents

Foreword

by Hazel Blears, Minister for Public Health

When we published the NHS Cancer Plan in September 2000, screening was included in the patient pathway with the rest of cancer services for the first time. I am pleased to report that good progress is being made on all aspects of the NHS Cancer Plan, including breast screening.

This has been another successful year for the NHS Breast Screening Programme. More women are being screened and more cancers are being detected than ever before. We are on target to meet the NHS Cancer Plan promise of expanding the breast screening programme. By 2004, all women aged 50 to 70 will be invited for breast screening and two view mammography will take place at all screening rounds by 2003. It is a great achievement that staff in the programme are maintaining the quality of the programme whilst these major changes are taking place.

This year, the NHS Breast Screening Programme has been challenged by discussions questioning the effectiveness of breast screening. We were therefore delighted with the results of a comprehensive international review by the International Agency for Research on Cancer (IARC) of the World Health Organisation (WHO) who concluded that breast screening by mammography of women aged 50 to 69 years reduces mortality from breast cancer by 35 per cent. This statement proves what we have always maintained – breast screening by mammography saves lives.

The programme continues to ensure that all women have access to information about screening. Following the launch of Informed Choice in October 2001, the NHS Breast Screening Programme teamed up with Talking Newspapers for their help in transcribing the leaflets into an audio format, and the Royal National Institute for the Blind (RNIB) has developed an English Braille version. The leaflet has also been translated into seventeen languages. This honest and open information for women from a diverse range of backgrounds is welcomed.

I would like to take this opportunity to thank all those involved with the programme for all their hard work, commitment and effort over the past year.

Hazel Blears

Introduction

by Julietta Patnick, National Coordinator, NHS Cancer Screening Programmmes

This year has been a year of consolidation for the breast screening programme. The statistics for the year 2000/01, which are presented in this review, provide evidence of the programme's achievements. Our service is improving in both sensitivity and specificity, increasing the effectiveness of the programme in terms of early detection of breast cancer, while causing fewer false alarms. This year saw the publication of two key reports relating to the breast screening programme. The first of these was the report of the frequency trial. This was a study which was originally funded by the United Kingdom Coordinating Committee for Cancer Research (UKCCCR) and which considered the benefits of screening more frequently. However, as even screening annually only showed a very small benefit, no change to the frequency of screening in this country is planned.

The breast screening programme has had to justify its existence from the outset and even though there is now more research than was available at the inception of the programme, the challenges to the worth of breast screening by mammography have, if anything, become more strident. In order to consider the issues, the International Agency for Research on Cancer (IARC), an agency of the World Health Organisation, brought together a group of experts to consider the benefits of breast cancer screening. They concluded that regular mammographic screening of women between 50 and 69 will save the lives of around two women for every thousand who are screened regularly. This is reassuring news for women and for professionals working in the programme.

We have previously reported in this review about the efforts that the breast screening programme is making to develop a more flexible workforce. The new ways of working project has now reached a successful conclusion during this year and we look forward to rolling out the new working practices in order to expand our programme to include women up to the age of 70.

Cooperation between the professions is not new for the screening programme and we are delighted to be amongst the first areas of the NHS to take this forward into new patterns of working. In this review we highlight the valuable contributions made by the surgeons and medical physicists to the screening programme and also focus on our close relationship with the cancer registries.

As ever, this review can only reflect some of what is happening in the NHS Breast Screening Programme. The features we include will give the reader a flavour of what is happening in England. We are very pleased that our colleagues in Scotland, Wales and Northern Ireland have joined with us so that we can present statistics for the entire United Kingdom. As always, I would like to thank everyone who works in the NHS Breast Screening Programme. Its continuing success is due to the dedication, expertise and hard work of each and every member of staff.

Julietta Patnick

Experts agree that mammography is succeeding in cutting deaths

The main question for any screening programme is: "does it save lives?". This continues to be asked of the NHS Breast Screening Programme, despite the growing weight of evidence that it does.

Periodic claims from Danish researchers Peter Gøtzche and Ole Olsen that the original breast screening trials did not provide evidence for a reduction in mortality have fuelled the debate since January 2000.

Professor Valerie Beral, of the Cancer Research UK Epidemiology Unit in Oxford, believes the evidence on the benefits of screening is now beyond doubt:

"About six in every 1,000 women aged 50 to 69 will die of breast cancer in the next 10 years without screening. Screening reduces this to four in every 1,000.

"That means two in every 1,000 women screened are saved, or one in 500. It is up to women to decide whether that number seems worthwhile to them. But the benefits are now clearly established and well understood."

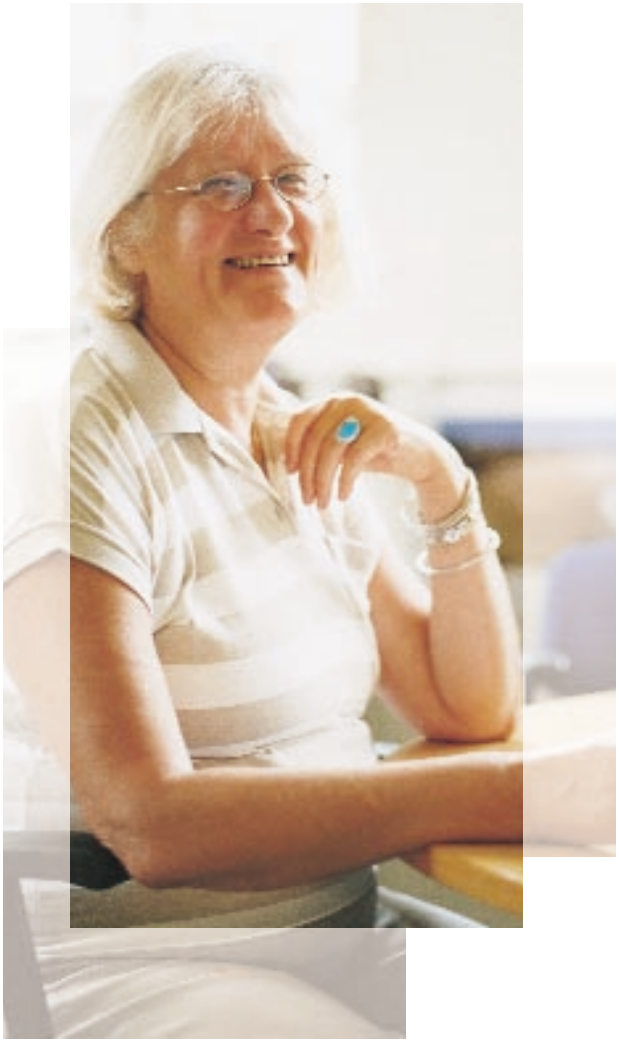
She adds: "Women have to know that even if they have been screened regularly they may still get cancer in between appointments. Screening is not as effective as one might wish or hope for but the probability is that it will save lives."

Professor Beral points out that although the evidence from the original trials is now several decades old, recent criticisms of their methodology did not undermine their main findings.

Moreover, it is important to remember that new randomised controlled trials in breast screening could never be organised, as it would now be unethical to deny women the chance of screening.

The robustness of the evidence was reconfirmed by an international panel of experts meeting at Lyon, France in March 2002. The group was convened by the International Agency for Research on Cancer (IARC) of the World Health Organisation (WHO) and comprised 24 experts from 11 countries. It concluded that trials have provided sufficient evidence for the efficacy of mammography screening of women between 50 and 69 years.

It also estimated the reduction in mortality from breast cancer among women who chose to participate in screening programmes at around 35 per cent. The quality of the trials that were used to make these evaluations was carefully assessed. The working group found that many of the earlier



Professor Valerie Beral *Cancer Research UK Epidemiology Unit*

criticisms were unsubstantiated and that the remaining deficiencies did not invalidate the trials' findings.

The group said the effectiveness of national breast screening programmes varied due to, among other things, differences in coverage of the female population, and quality of mammography and treatment. Organised screening programmes were more effective in reducing the rate of death from breast cancer than sporadic screening of selected groups of women.

The working group also concluded that there was only limited evidence that screening women aged 40 to 49 led to a reduction in mortality.

Added Professor Beral: "The IARC report showed international, independent people coming together and looking at the evidence objectively. The numbers are real."

Another study defending the validity of the early trials was published in the *Lancet* in March (Lancet 2002; 359: 909-19) by Dr Lennarth Nyström and colleagues, from the Department of Public Health and Clinical Medicine, Umeå University, Sweden.

This updated the overview of the Swedish randomised controlled trials on mammography screening up to and including 1996. The trials followed some 130,000 screened women and 117,000 unscreened women for an average of nearly 16 years and found a significant overall reduction in breast cancer mortality of 21 per cent in the screened group. For women who were in their sixties at entry into the trial, the reduction was an even more impressive 33 per cent.

The researchers concluded: "The advantageous effect of breast screening on breast cancer mortality persists after long term follow up. The recent criticism against the Swedish randomised controlled trials is misleading and scientifically unfounded."

Cooperation with cancer registries brings shared benefits

Cancer registration has been conducted in parts of the UK since 1929 and achieved national coverage in 1962. A network of cancer registries across the UK collects population-based data on the incidence, mortality and survival from cancer. The NHS Breast Screening Programme both supplies information to the registries and receives it in return. Dr Hannes Botha, Director of the Trent Cancer Registry, explains:

"We collect information on all new cases and look at the incidence and epidemiology of breast cancer to find out if there are trends. We also look at survival, which gives an insight into treatments and how good the quality of care is for cancer."

Cancer statistics are collated from pathology laboratories, hospital records, death certificates and a variety of other sources including hospices.

The registries cooperate with the breast screening quality assurance centres to exchange information about women with breast cancer. Of particular value to the screening service is the chance to pick up data on interval cancers.

"There is mutual benefit from this exchange of information," says Dr Botha. "We cross check all cases of cancer in women who have been screened at a given time, and if a cancer we have registered occurred in a woman before the next episode of screening is due, then this points to it being an interval cancer. The only way the screening service can know about these cases is by getting our records.

Dr Hannes Botha *Director of the Trent Cancer Registry*

"On the other hand we may be told about cancers which for some reason haven't reached us, so there is definitely benefit to both sides. In addition, the possibility of exchanging information on other aspects of breast cancers like size (an indication of prognosis and survival), and pathology gives us a better, clearer, diagnosis. This enables us to make a valid analysis."

Chris Carrigan *National Cancer Registry Coordinator*

Chris Carrigan, National Cancer Registry Coordinator, agrees that the ethos of exchange is very positive. Based at St Thomas' Hospital, London, in the Cancer Action Team, Chris sees first hand the importance of good quality data.

"My job is to make sure that everybody is providing information to the cancer registries and that they are doing it well", says Chris.

"I need to make sure that collecting and feeding data into the cancer registries is part of the day-to-day routine. It should become second nature rather than a last minute thought of 'Oh, I'd better send information to the cancer registries'. I would like to see a coordinated approach up and down the country", explains Chris.

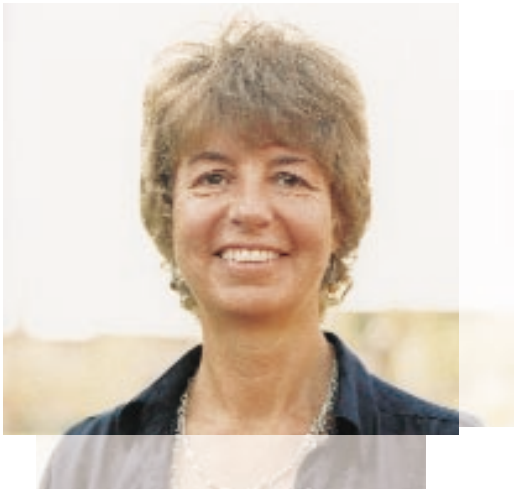
The relationship between the programme and cancer registries works particularly well in the West Midlands. Chris explains that the region is especially effective as it has one point of contact in Dr Gill Lawrence.

Dr Lawrence is Director of the West Midlands Cancer Registry, Director of West Midlands Cancer Intelligence Unit and Director of the region's breast and cervical screening quality assurance programmes. Dr Monica Roche combines the same three roles in the Oxford region.

Dr Lawrence feels her triple role helps her lead the development of quality assurance for wider cancer services based on the screening model. "All the things we do for screening quality assurance we could do for symptomatic cancers. We are transferring the methodology of setting standards and then monitoring performance against those standards", said Dr Lawrence.

Dr Lawrence agrees with Dr Botha that the links between cancer registries and the screening service allow far more detailed cancer histories to be drawn up than would otherwise be possible – for instance, was the cancer found in a lapsed attender or a non-attender or was it an interval cancer?

"Both the registries and the screening programme have benefited from this sharing of information and I am sure that our good working relationship will be ever more useful as it develops in the future."



Dr Gill Lawrence *Director of the West Midlands Cancer Registry*

Screening and surgeons work together to improve patient care

The British Association for Surgical Oncology (BASO) is the leading research and organisational body involved in promoting standards of cancer surgery and has within it a specialised association for breast cancer surgery.

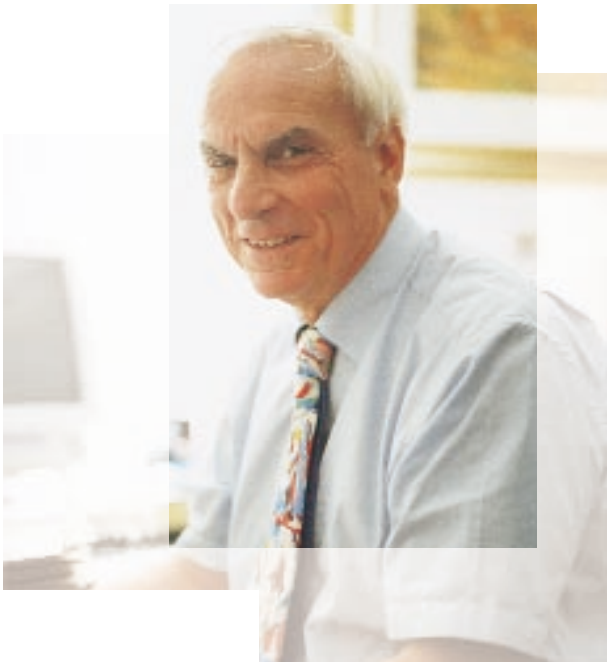
The organisation freely admits that it would not exist in its present form were it not for the close relationship it enjoys with the NHS Breast Screening Programme.

Professor Roger Blamey, formerly Professor of Surgical Sciences at Nottingham City Hospital, was one of the founding members of the BASO breast group and served as its first chairman between 1988 and 1996.

He explained that in 1987, when breast screening was to be introduced, BASO called a special meeting to discuss the implications for breast surgery. They concluded that surgeons would need to specialise to acquire the necessary expertise and that only some, not all, surgeons should carry out such work.

Dr J A Muir Gray, then in charge of screening, had similar thoughts and the two worked with like-minded colleagues, such as Dr Joan Austoker, to draw up guidelines.

Said Professor Blamey: “We published the first guidelines for surgeons in breast screening in 1992. They were the first guidelines with auditable measures that had ever been produced by any surgical group. The other thing we pushed heavily for, apart from specialisation, was multi-disciplinary working.”



Professor Roger Blamey *formerly Professor of Surgical Sciences – Nottingham City Hospital*

Breast surgeons now attend twice yearly audit meetings where they review their practice. The Annual General Meeting of the Association of Breast Surgeons at BASO discusses surgical screening data for the whole year and leads to the publication of a comprehensive audit report.

Mr Steve Holt *Consultant Breast Surgeon – Chesterfield Royal Hospital*

Professor Blamey was the lead researcher in the breast cancer screening frequency trial which concluded that there was only a very small benefit from screening women annually rather than every three years.

The results were published in the European Journal of Cancer in July and provide a clear evidence based response to a challenge often levied against the NHS Breast Screening Programme.

Professor Blamey acknowledges that screening has acted as a vital catalyst by also raising surgical standards for women referred outside the screening service.

“About one in seven breast cancers that we see come from breast screening. We felt if specialisation was good for screening, it was also good for symptomatic women.”

With this in mind, the BASO breast group went on to produce surgical guidance on the management of symptomatic breast cancer and guidelines for breast surgeons’ training.

Professor Blamey said all women with breast cancer owed screening a debt for raising standards in treatment and care.

“Getting the entire process of specialisation in breast cancer and setting audit standards in breast cancer on the back of it are two of the great successes of the whole screening story. The care of breast cancer patients has improved enormously and of course the mortality is falling sharply as well.”

Mr Steve Holt, Consultant Breast Surgeon at the Chesterfield Royal Hospital in Derbyshire, is equally convinced that cooperation between the breast screening service and BASO is of great value.

“Screening has brought up the standards of symptomatic surgery. From the outset, screening has always had high standards with very well supported audit. As breast surgeons our screening work has been the area which is the most tightly controlled. There is now an acceptance this should be the same for our symptomatic work.”

Mr Holt added: “BASO sets standards. We are not an exclusive club, but people realise that if they are to practise breast surgery they would be very unwise to fly in the face of BASO guidelines.

“BASO is seen as a supportive friend to many surgeons in the breast surgery field. There is a tradition in Trent, and I’m sure this is true elsewhere, that the quality assurance visit is not threatening but is there to help people and improve the service to women.”


Town and country screening shows the range of the service's work

The NHS Breast Screening Programme operates across differing socio-economic, ethnic and geographic landscapes, from small rural villages to crowded inner cities, while at the same time working to uniform national standards.

Screening centres even within a few miles of each other can serve hugely varying populations. These groups can have very different needs in terms of the information women require and the initiatives needed to encourage them to accept their invitation for screening.

In the West Midlands health region, South Birmingham and Shropshire provide examples of the diversity of work that is happening across the country.

In South Birmingham, Zoe Vegnuti, Superintendent Radiographer, looks after a busy health promotion programme as well as the day-to-day operational issues, such as ensuring any staffing or equipment problems are sorted out.

A usual part of her working week is giving talks to people about the work of the service. This can range from 120 health professionals at Birmingham University to six women at a local mosque.

South Birmingham has a 21 per cent minority ethnic make-up in its screening population, so Mrs Vegnuti liaises closely with her local link workers and interpreters. She is involved with a New

Zoe Vegnuti *Superintendent Radiographer - West Midlands*

Opportunities research project specifically looking at the barriers to breast screening attendance faced by Bangladeshi and Pakistani women.

"We work closely with the people in the community that the minority ethnic groups listen to and respect. I feel we have good communication links to the community. This has meant we have been able to talk to groups in the right environment and the right setting, so that we are already accepted when we go there."

Mrs Vegnuti, who has been Superintendent for 10 years, is Radiography Coordinator for the West Midlands Regional Quality Assurance Group, and the Chairman of the National Quality Assurance Group for Radiography.

She added: “When we first started screening our acceptance rate was about 63 per cent. We now achieve a 70 per cent acceptance rate. This is down to the hard work of all the screening staff. We never sit back and think ‘Fine, we’ve achieved the national target.’ We are always trying to get it better than that, but we feel for an inner city programme we are doing quite well.”

In Shropshire, Angela Price, Superintendent Radiographer, has responsibility for five radiographers, two mobile units and a large patch of countryside.

The main towns in Shropshire are Shrewsbury and Telford where the average uptake for screening is 82 per cent and many women over 65 self-refer. The staff still continue to look for innovative ways to maintain and improve this.

There is a difficulty in recruiting staff, however, because the county has a far less mobile population than the West Midlands. An unfilled radiographer vacancy means that the second mobile unit is unable to be used for much of the time.

Said Mrs Price: “We don’t have the staff to run two mobile units. But we don’t have any backlog because the radiographers are extremely dedicated. If we do slip behind, we work twice as hard to catch up again. We can be working six days a week on one van, and perhaps one day a week on the other.

Angela Price *Superintendent Radiographer - Shropshire*

“We have been screening on Saturdays in some places recently. A lot of the women find it helpful. We have a good uptake from the younger women who work in the week. A lot have commented that it is nice that they didn’t have to take time off work.”

Mrs Price added: “The service is popular. We think it is possibly to do with women’s clubs, women’s institutions, mothers’ unions - where it gets talked about. If women say they can’t get there, others volunteer to take them. The small towns are friendly, people know each other, and if you are in clubs and groups it gets talked about. Friends will say to each other ‘I’ll take you’.

“Screening is well supported. It is appreciated. We do get letters of thanks. Even the women who have surgery, when I see them every year for their check-ups, I find the majority are really grateful to screening because it probably saved their lives.”

A day in the life of a medical physicist

Medical physicists provide scientific and technical help and advice across all areas of the health service that use x-rays and other forms of imaging and are a vital resource for the NHS Breast Screening Programme.

Liz Pitcher, based at Bristol General Hospital, explains that medical physicists are perhaps best known to the public for their work in radiotherapy. This can involve calibrating the machines to deliver the appropriate doses for individual patients, checking that machines are operating properly and participating in research of therapeutic techniques for cancer. What people may not realise is that the medical physicist's role also includes supporting diagnostic techniques like mammography.

The profession is graduate based, with an initial two year training scheme, followed by further training of two to four years in specialised areas.

Ms Pitcher explains: "Most of us that have done physics or engineering at university are looking for an application for that knowledge and to be able to help people directly because of this training is attractive. We supply physics services on behalf of the NHS Breast Screening Programme to hospitals in Bristol and provide central coordination of services to the whole of the south west region from Cornwall to Gloucester, and over to Poole and Swindon.

"A typical working day can involve testing the performance of diagnostic x-ray equipment, checking that the machines stay within performance specifications, or further investigating reported faults before the engineers are called in.

"There is a big administrative workload to do with radiation protection regulations. If new equipment is being installed we have to plan the appropriate protection for the woman and the radiographer."

New legislation, the Ionising Radiation (Medical Exposure) Regulations 2000, lays down a whole set of procedures on how hospitals go about exposing patients to x-rays or treatment.

The need for the lowest possible dose of x-ray consistent with a good quality image is especially important in a screening programme, where mainly healthy women are being investigated.

The performance of a mammography x-ray machine is optimised to produce good image quality for a minimum radiation dose. This may mean lower doses to smaller breasts and slightly higher doses to larger breasts. The physicists,

Liz Pitcher *Bristol General Hospital*

in conjunction with the radiographers and radiologists, help ensure the machines are operating at peak efficiency.

The physics team regularly monitors x-ray doses to the breast. Every year the team monitors 50 consecutive women, from each mammography x-ray machine, taking a total of 200 films. The calculated doses are then assessed against national standards. Image quality is also assessed on a monthly basis. Data from 32 mammography x-ray machines in the eight different breast screening units are monitored and compared.

“If two systems are using the same equipment and the same film, they should be giving similar radiation doses, and if they are not we will look into it.”

Ms Pitcher visits the eight breast screening units in the South West region at least once a year and organises four biannual meetings in the region per year – two for physicists and two for radiographers, radiologists and physicists. “We meet radiographers and radiologists. We pass on what we know, and we learn from them. We feel very much part of a multidisciplinary team.”

Ms Pitcher added: “If you took medical physicists away from the NHS Breast Screening Programme, it could still work, but you would lose the very tight control on quality and radiation dose so the images would not be optimised.

“Without physicists there would be a less effective service, and quality could be compromised. It has to be done in a multidisciplinary way, so we work with the radiographers and radiologists, particularly on the image quality side.

“Everyone is genuinely interested in getting the best images at the lowest doses – everyone has that at the heart of what they are doing.

“We can be seen as a nuisance, especially when we collect data during a busy screening session, but I do genuinely feel we are part of a team of equals.”

NHS Breast Screening Programme 2000/2001 statistics

It is to the credit of the entire staff – administrative, medical, radiographic, technical and nursing – that the quality of the programme continues to improve at a time of enormous change in the screening programme. Thanks are also due to the many staff who work in quality assurance and data management who continue to produce robust and timely statistics upon which we can base our wider quality assurance work and report to the women we screen. We also owe a debt of gratitude, as ever, to the Cancer Screening Evaluation Unit who have analysed these figures for us and to the Association of Breast Surgeons at BASO with whom we work on the surgical data.

The UK statistics presented here paint a picture of a programme that is continuing to mature. Yet again the number of cancers detected has risen. However, while the numbers of women screened in the target age group (50 – 64) has risen, the acceptance rate has dropped slightly as has the overall numbers of women screened. It is important to monitor if these trends continue into next year.

In September of the year being reported, the NHS Cancer Plan announced that the screening programme was going to be extended to include women up to and including the age of 70 by 2004. This change in policy is not demonstrated in these figures since, in the year in question, only the original pilot sites were inviting older women, and then only to the age of 69. Nevertheless, more women over 65 and indeed over 70 attended and we can expect this to grow each year for the next few years.

Another pattern seen this year is the increase in the number of women recalled for assessment and the proportion of benign biopsies carried out. The number of cancers detected in women over 50 rose to almost 10,000 and the rate of cancers detected per thousand women screened has also risen. This pattern of fewer false alarms and increasing sensitivity of the programme is reflected in the statistics and we have focused in particular on the proportion of women recalled for assessment who are found to have cancer.

Screening activity: women aged 50+ • **Table 1**

This year the number of women of 50 and over who were screened rose slightly largely due to the number of women who referred themselves. The acceptance rate dropped slightly, which is rather disappointing and clearly needs to be kept under review. The quality of the programme continues to improve. The proportion of women recalled for assessment was exactly the same as in the previous year but the number of cancers detected rose, from 6.4 to 6.6 per thousand women screened, indicating an improvement in the specificity of the programme. The standardised detection ratio rose once again which is a credit to all the staff of the screening programme who are working under increasing pressure.

	Number of women invited	Acceptance rate (% of invited)	Number of women screened (invited)	Number of women screened (self/GP referrals)	Total number of women screened	Number of women recalled for assessment	% of women recalled for assessment	Number of benign biopsies	Number of cancers detected	Cancers detected per 1,000 women screened	Number of in situ cancers detected	Number of invasive cancers less than 15mm	Standardised detection ratio
2000/01	1,815,610	75.0	1,361,881	133,128	1,495,009	79,068	5.3	1,966	9,866	6.6	2,045	4,115	1.20
1999/00	1,811,541	75.4	1,365,636	124,154	1,489,790	78,843	5.3	1,928	9,525	6.4	2,009	4,041	1.14

Acceptance by type of screen • **Table 2**

Analysis of the acceptance rate shows that the majority of the fall is in women invited for a repeat screen. For women invited for the first time, the acceptance rate has fallen from 73.4 per cent last year to 72.9 per cent this year. There is a similar fall in the acceptance rate of women being invited for a second or subsequent occasion, from 86.1 per cent last year to 85.6 per cent this year. But this has a greater impact on the programme, since this group forms the majority of women invited.

	Acceptance following first invitation (%)	*numbers*	First screen previous non-attenders (%)	*numbers*	Acceptance following second or subsequent invitations (%)	*numbers*	Acceptance following early recall (%)	*numbers*	Total (%)	*numbers*
50-54	74.8	*364,241*	31.9	*73,655*	87.5	*282,101*	97.8	*2,108*	75.5	*722,105*
55-59	38.8	*11,027*	18.3	*81,493*	85.9	*480,511*	96.9	*988*	75.4	*574,019*
60-64	36.2	*8,381*	11.1	*60,784*	83.8	*417,142*	96.0	*793*	73.9	*487,100*
65-69	36.3	*465*	10.3	*3,776*	82.9	*27,418*	97.6	*295*	73.8	*31,954*
70+	70.5	*44*	66.7	*42*	89.2	*241*	97.1	*105*	87.0	*432*
Total 50-64	72.9	*383,649*	20.9	*215,932*	85.6	*1,179,754*	97.2	*3,889*	75.0	*1,783,224*

Screening quality: first screen (50-64) • **Table 3**

Several screening programmes are now moving into their fifth round of inviting women for their first screen. The expertise that has been accumulated in that period continues to be demonstrated in the quality of screening provided. This year slightly more women were recalled for assessment and there were more benign biopsies performed. However, the invasive cancer detection rate per thousand women screened rose from 5.0 to 5.5 per thousand women screened and the small cancer detection rate rose from 2.6 to 2.8 per thousand women screened, contributing to a rise in the standardised detection ratio from 1.26 to 1.38.

	Acceptance rate at first invitation (%)	Recall rate (%)	Benign biopsies per 1,000 women screened	Invasive cancer detection rate per 1,000 women screened	In situ rate per 1,000 women screened	Invasive cancers less than 15mm per 1,000 women screened	Standardised detection ratio	Total number of women screened for the first time
Standard	>=70.0	<7.0	<3.6	>3.6	>=0.4 to <=0.9	>=1.5	>=1.0	–
Achieved	72.9	8.6	2.9	5.5	1.8	2.8	1.38	324,756

Screening quality: subsequent screen (50-64) • **Table 4**

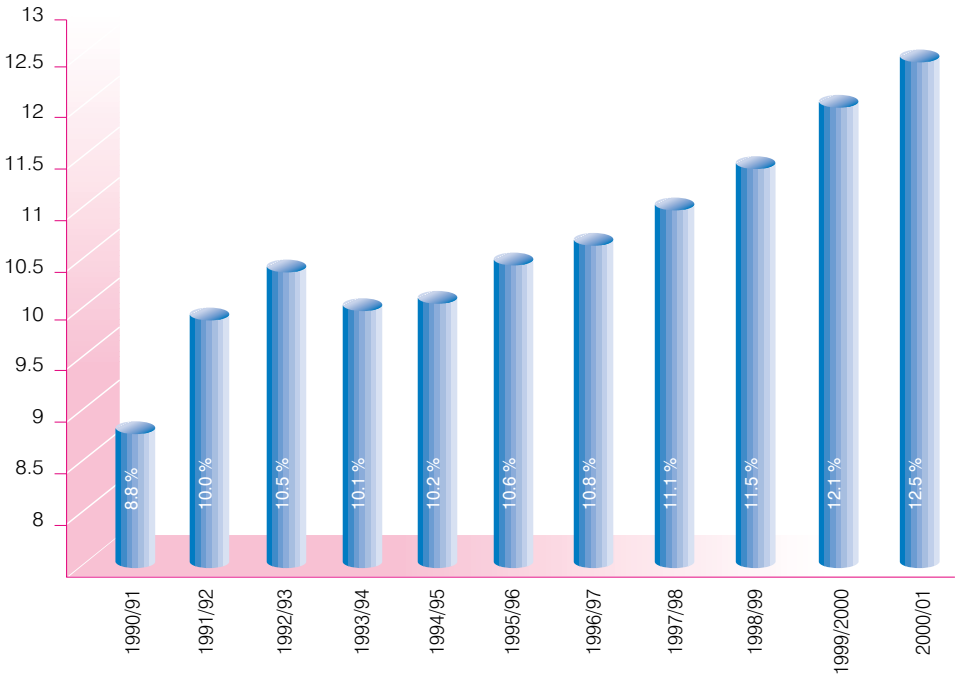
There are a number of differences between the first and subsequent screens. Chief amongst these is that in 2000/2001, two views were not generally taken for these women, as they were for first time attenders. In addition, there are not as many rounds of experience with this "incident" round screening as there are with inviting women for the first time. Nevertheless, the quality is again continuing to improve as the invasive cancer rate per thousand women screened has risen from 4.4 per thousand women screened and the small cancer rate from 2.41 per thousand women screened to 2.48. This has resulted in an increase in the SDR from 1.1 to 1.14. For the first time the number of women screened for a second or subsequent occasion rose to over one million.

	Acceptance rate at subsequent screen (%)	Recall rate (%)	Benign biopsies per 1,000 women screened	Invasive cancer detection rate per 1,000 women screened	In situ rate per 1,000 women screened	Invasive cancers less than 15mm per 1,000 women screened	Standardised detection ratio	Total number of women screened a second or subsequent time
Standard	–	<5.0	<4.0	>4.0	>=0.5 to <=1.0	>=1.65	>=1.0	–
Achieved	85.6	4.0	0.8	4.6	1.15	2.48	1.14	1,009,387

Cancers detected as % of women recalled for assessment • **Table 5**

It is often said that nine out of ten breast lumps prove not to be cancer. When the breast screening programme first began, it was certainly true that more than nine out of ten women who were recalled for assessment did not have cancer. Being recalled for assessment is an extremely anxious time for women. Every effort is therefore made by the screening programme to minimise the number of women who are recalled for assessment, while maintaining or seeking to improve the cancer detection rate.

The data presented in this table show that the proportion of women who are recalled for assessment who actually have a cancer has risen. Thus the false alarm rate of the programme has fallen, reducing the amount of anxiety created by a recall for assessment which proves not to result in a cancer. One in eight women who are recalled for assessment by the programme are now found to have breast cancer.



Screening outcome: (50-64) • **Table 6**

The numbers of women in each category are very similar to previous years, with early recalls continuing to decline in line with screening programme policy. This year the fall is almost 18 per cent. The women who are referred themselves or by their GP continue to demonstrate a pattern very similar to those women who are attending for their first screen, with a lower proportion of small cancers than in invited women.

	Number of women screened	% women recalled for assessment	Benign biopsies per 1,000 women screened	Overall cancer rate per 1,000 women screened	In situ cancers per 1,000 women screened	Invasive cancers per 1,000 women screened	% invasive cancers less than 15mm
First screen (invited)	324,756	8.6	2.9	7.3	1.8	5.5	50.7
Subsequent screen (invited)	1,009,387	4.0	0.8	5.7	1.1	4.6	54.4
Self/GP referral	35,044	6.1	1.3	6.9	1.5	5.4	47.3
Early recall	3,779	87.6	18.5	29.6	10.1	19.3	58.9

Screening outcome: first screen by age group (invited women only) • **Table 7**

	Number of women screened	% women recalled for assessment	Benign biopsies per 1,000 women screened	Cancers detected per 1,000 women screened
50-54	295,817	8.6	2.9	7.0
55-59	19,145	8.3	2.6	8.7
60-64	9,794	7.6	2.0	13.3
65-69	556	7.2	3.6	16.2
70+	59	5.1	0.0	16.9
Total 50-64	324,756	8.6	2.9	7.3

The number of women invited and screened for the first time by the screening programme has dropped by 20,000. The vast majority of women invited for the first time are in their early 50s. The proportion of women recalled for assessment and the proportion of benign biopsies per thousand women screened have both risen slightly. However, the cancer detection rate has risen from 6.7 last year in women aged 50 – 64 to 7.3 this year. Most of this increase has been seen in those women in their early 50s, where the rate has risen from 6.4 to 7.0 cancers per thousand women screened.

Screening outcome: subsequent screen by age group (invited women only) • **Table 8**

	Number of women screened	% women recalled for assessment	Benign biopsies per 1,000 women screened	Cancers detected per 1,000 women screened
50-54	246,921	4.2	0.8	4.3
55-59	412,919	3.9	0.8	5.6
60-64	349,547	3.8	0.8	6.9
65-69	22,739	3.5	0.7	8.6
70+	215	0.5	0.0	0.0
Total 50-64	1,009,387	4.0	0.8	5.7

This table presents the data on the results of screening from over one million women who have been invited for a repeat screening. As with the prevalent (first screen), the recall and benign biopsy rates have risen slightly. Here there has also been an increase in the cancer detection rate per thousand women screened, but it is slighter than that seen in the first screening round, here it has risen from 5.6 to 5.7 cancers per thousand women screened.

Screening outcome: self/GP referrals by age group • **Table 9**

	Number of women screened	% women recalled for assessment	Benign biopsies per 1,000 women screened	Cancers detected per 1,000 women screened
50-54	12,317	7.5	1.5	5.7
55-59	10,952	5.8	1.5	7.0
60-64	11,775	5.0	0.8	8.2
65-69	66,143	4.5	0.9	10.4
70+	31,941	5.4	1.2	13.8
Total 50-64	35,044	6.1	1.3	6.9

Women who attend in this category and who are in the usual "target" age range of 50 – 64 are generally those who have failed to attend when invited. We usually see a fairly high cancer detection rate in these women compared to their contemporaries. This year, their cancer detection rate is slightly lower than that seen in women coming for the first time, but higher than those attending for second or subsequent screens. This suggests that many of these women have been screened in the past, but had failed to attend in response to a more recent invitation. The largest proportion of women in this self/GP referral group, is the 65 – 69 year olds, that is the group that has just moved out of the target age range. Given that the screening programme is working to extend routine invitations up to and including 70 year olds it is heartening to note that 98,000 women aged 65 and over referred themselves for screening.

Screening of women aged 70+ • **Table 10**

The NHS Cancer Plan announced in September 2000 that the screening programme would be extended to invite women up to and including the age of 70 by 2004. The information systems currently cannot report on women aged 65 – 69 and then 70 and over so data can only be presented in this format. This is currently being addressed. At the moment the number of women aged 70 and over who are screened is very small, although it rose 11 per cent between 1999/2000 and 2000/01. Last year was the first year in which we could report on women aged 70 and over and the outcomes were not as we had expected. Further scrutiny has been carried out and definitive figures for both last year and this year are presented here. As we would have expected, the cancer detection rate is very high in women in their 70s.

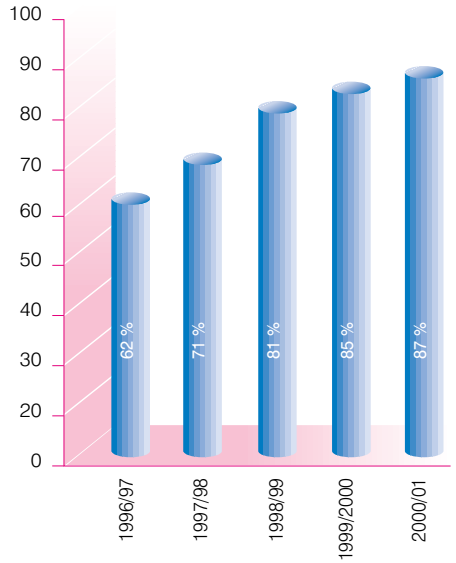
	Number of women screened		% women recalled for assessment		Benign biopsies per 1,000 women screened		Cancers detected per 1,000 women screened	
	99/00	*00/01*	*99/00*	*00/01*	*99/00*	*00/01*	*99/00*	*00/01*
First screen (invited)	53	59	1.9	5.1	0.0	0.0	0.0	16.9
Subsequent screen (invited)	455	215	4.0	0.5	2.2	0.0	15.4	0.0
First screen (self/GP referral)	6,381	5,448	8.1	8.9	1.4	3.1	23.7	20.2
Subsequent screen (self/GP referral)	22,108	26,493	4.7	4.7	0.7	0.8	12.1	12.5
Early recall	182	102	68.1	86.3	11	39.2	44	68.6
Total	29,179	32,317	5.8	5.6	1.0	1.3	14.9	13.9

Total screening activity all ages • **Table 11**

	Number of women screened	% women recalled for assessment	Cancers detected per 1,000 women screened	Total number of cancers detected
Under 50	52,144	6.7	4.0	209
50+	1,495,009	5.3	6.6	9,866
Total	1,547,153	5.3	6.5	10,075

This table presents all screening activity including those women under 50 who were invited for scheduling reasons. This group saw a fall of around 8,000. Thus, while the numbers of women over 50 rose slightly, there was, in fact, a net drop in numbers of women screened of around 3,500. For the first time the overall number of cancers detected by the screening programme went over 10,000.

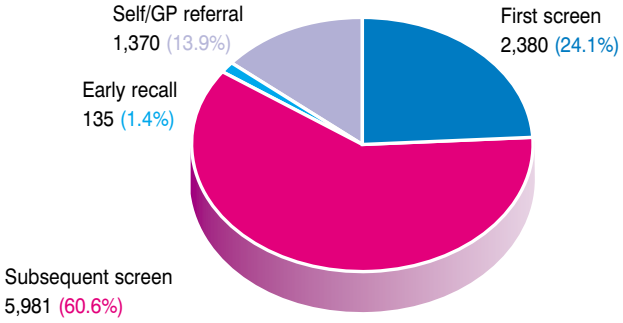
Cancers with non-operative diagnosis • **Table 12**



This table is drawn from data collected in collaboration with the Association of Breast Surgeons at BASO. We are pleased to include data from Scotland as well as the rest of the United Kingdom in this year's data. Taking the United Kingdom as a whole, the trend of improvement in this figure has continued. 87 per cent of women with a cancer detected through the screening programme can now have that diagnosis made before any surgery is undertaken. This means women can consider their options and have only one operation for removal of cancer.

Distribution of cancers detected in women age 50+ • **Table 13**

The majority of women that we screen are now coming for a second or subsequent occasion. Not surprisingly, therefore, over 60 per cent of our cancers come from these women. It is a remarkably consistent figure that 75 per cent of the breast cancers we find each year are lymph node negative, thus indicating a higher chance of cure for the woman concerned.



Women aged 65+ screened • **Table 14**

The number of women aged 65 and over whom we screen has now risen to over 122,000. This is 100,000 more than the first year for which we have this figure available, 1992/93. Many of these women are invited as the first few programmes expand their service to include women up to 70, but the majority continue to refer themselves. We welcome women over 65 into the programme and look forward to seeing these numbers grow considerably over the next few years.

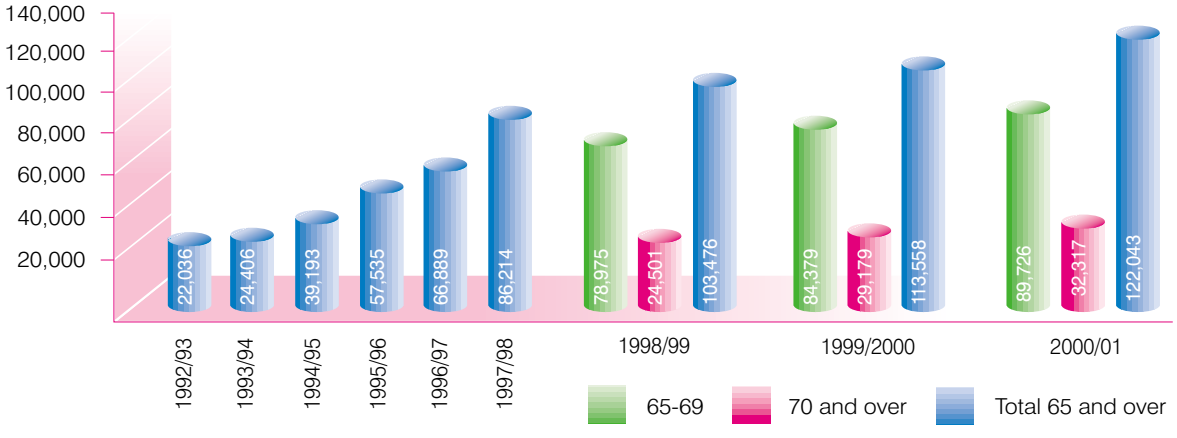


Table 15 & 16 (below)

The results for the NHS Breast Screening Programme are reported here by health region in England and for Scotland, Wales and Northern Ireland. The English health regions are those which were in operation during the year 2000/01 to which the figures relate. Now that the screening programme is mature, certain patterns can be seen regularly in these figures. For example, Scotland always has the highest recall rate in the first screening round, and Northern Ireland always has the lowest rate in the incident round. There appears to be much more variation by region in the first screening round than in the subsequent rounds, but the numbers are much smaller and so differences appear to be more extreme.

Outcome of prevalent (first screens) by region (50-64) • **Table 15**

	Northern & Yorkshire	Trent	West Midlands	North West	Eastern	London	South East	South West	Scotland	Wales	Northern Ireland
Acceptance (%)	78.2	78.7	73.0	73.6	74.0	57.7	73.3	76.6	74.3	75.3	72.9
Recall (%)	7.7	7.9	6.5	9.2	8.0	8.2	9.4	9.2	10.9	8.2	6.8
Benign biopsies per 1,000 women screened	2.9	2.7	2.7	4.6	2.5	2.6	2.3	3.1	3.3	3.6	2.2
Cancer detection rate per 1,000 women screened	5.3	6.1	4.5	4.6	5.4	4.7	5.0	5.0	5.9	4.7	5.0
Standardised detection ratio	1.39	1.67	1.35	1.31	1.37	1.25	1.35	1.29	1.47	1.37	1.36

Outcome of incident (subsequent screens) by region (50-64) • **Table 16**

	Northern & Yorkshire	Trent	West Midlands	North West	Eastern	London	South East	South West	Scotland	Wales	Northern Ireland
Acceptance (%)	87.7	89.0	86.6	85.3	85.5	78.7	86.3	86.6	83.3	87.1	84.7
Recall (%)	3.6	3.2	3.0	4.4	3.8	4.1	4.3	4.7	4.7	3.7	2.8
Benign biopsies per 1,000 women screened	0.9	0.7	0.6	0.9	0.7	0.9	0.8	0.9	0.7	0.5	0.8
Cancer detection rate per 1,000 women screened	4.5	4.3	4.3	4.8	4.6	4.5	4.5	4.4	5.1	4.7	5.0
Standardised detection ratio	1.13	1.06	1.08	1.17	1.15	1.12	1.14	1.10	1.27	1.15	1.19

NHS
Cancer Screening Programmes

NHS Breast Screening Programme
The Manor House
260 Ecclesall Road South
Sheffield S11 9PS

www.cancerscreening.nhs.uk

ISBN 1 871997 69 0

Editor: Julietta Patnick **Design:** Anytime After Nine Ltd. **Print:** Marshall Hayward **Production:** Citigate Communications