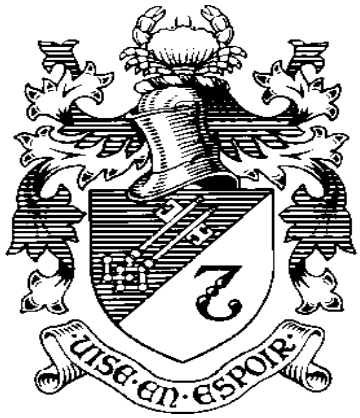

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NHS BREAST SCREENING PROGRAMME

&

ASSOCIATION OF BREAST SURGERY AT BASO

AN AUDIT OF SCREEN DETECTED BREAST CANCERS FOR THE YEAR OF SCREENING APRIL 2001 TO MARCH 2002

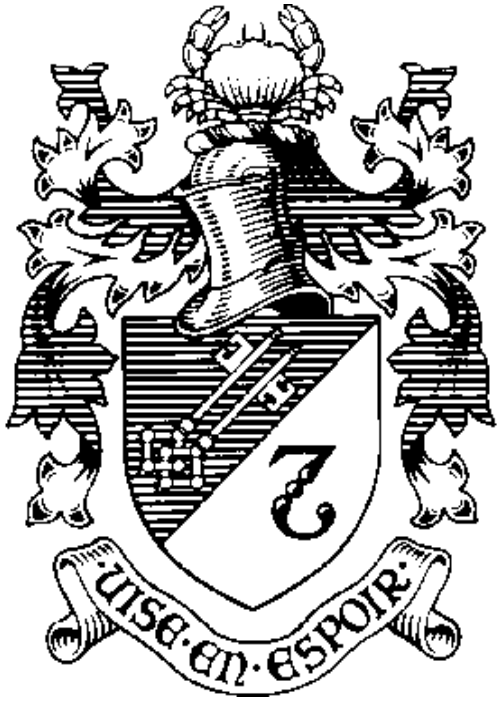
PRESENTED AT THE
ASSOCIATION OF BREAST SURGERY AT BASO MEETING

2nd April 2003

THE MOTORCYCLE MUSEUM, BIRMINGHAM

NHS

Cancer Screening Programmes



FOREWORDS

Once again, I am pleased to introduce these audit results which present a picture of the activity of surgeons in the NHSBSP in the UK. Over 10,000 cancers screen-detected in women of all ages are detailed in this audit. The audit shows that, with the recent advancements in non–operative diagnosis, it is possible to plan the management of breast tumours prior to surgery. In particular, if invasive disease is diagnosed using non-operative core biopsy, the need for repeat therapeutic operations can often be avoided.

The NHSBSP was set up to detect small invasive breast tumours with good prognosis. This audit shows that these tumours are more likely to be candidates for conservation surgery rather than mastectomy. The survival audit shows that the small, low grade, node negative tumours with good and excellent prognosis, that formed the vast majority of the tumours detected in 1996/97 are exhibiting very favourable survival rates compared with average breast cancer survival in this country at this point in time.

Julietta Patnick
National Co-ordinator, NHS Cancer Screening Programmes, February 2003

Your auditors are pleased to report the surgical screening data for 2001/02. We have made every effort to build in data checks to enable quality assurance of these data. Over the years, we have become increasingly confident of some aspects of the data, e.g. lymph node positivity. Sadly, we have concerns about some of the newer aspects of the audit, particularly the adjuvant therapy data. This latter audit reveals disturbing differences in the ability to collect important data across the United Kingdom. Nevertheless, I do appreciate just how much we demand of you in terms of information. Staff in breast units are already overburdened and given the often inadequate support for data collection in the NHS, I am truly appreciative of the willingness of so many staff to go the extra mile.

This meeting sees the launch of the Sloane Project. This is an audit of non-invasive breast cancer identified within the NHSBSP. Considerable time has been spent designing user-friendly forms to collect the data in terms of radiology, surgery and pathology. Although the programme identifies about 2000 new non-invasive breast cancers a year, the burden of collecting data on the individual unit should be modest. I estimate that only in the very biggest units will it amount to more than one patient a week. The Sloane Project will result in our amassing the largest series in the world in terms of the diagnosis, management and long-term prognosis for this fascinating and ill understood disease.

Finally, it is a pleasure to welcome Professor Monica Morrow to act as the Inquisitor this year and we are very grateful to her for participating in this meeting. As always, these are your data. I think they represent an outstanding achievement by all who contributed to them.

Hugh Bishop
Chairman, Breast Audit Group, February 2003

ACKNOWLEDGEMENTS

The 2001/02 audit of screen detected breast cancers was designed and directed by the Breast Audit Group of the Association of Breast Surgery at BASO.

Mr Hugh Bishop	Chairman, Breast Audit Group, Association of Breast Surgery at BASO
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Prof Paul Sauven	Association of Breast Surgery at BASO
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Dr Jackie Walton	Breast Screening QA Research and Information Manager, West Midlands QA Reference Centre
Mrs Margot Wheaton	Chair of the National Breast Screening System Users Group and Administration QA Co-ordinator, West Midlands NHSBSP

The Breast Audit Group would like to extend their thanks to the following individuals and groups for their contribution to the 2001/02 audit of screen detected breast cancer.

All NHSBSP Surgical QA Co-ordinators, QA Co-ordinators and QA Directors for overseeing regional data collection and validation at the regional QA Reference Centres.

Screening Office Managers and staff within the NHSBSP who contributed to the data collection process.

All regional cancer registry staff who co-operated with their regional QA Reference Centres to collect data for the survival audit.

Mrs Diane Edwards from the Health GIS Service at the West Midlands Cancer Intelligence Unit for producing the map of the NHSBSP.

Dr Cheryl Livings from the Research and Information Team at the West Midlands Cancer Intelligence Unit for help with calculating relative survival.

Ms Lucy Davies at the ABS at BASO office for valuable assistance throughout the year, including the distribution of booklets.

The Breast Audit Group would also like to thank the NHSBSP national office for its financial assistance in support of the 2001/02 audit of screen detected breast cancer.

CONTENTS

INTRODUCTION

AIMS AND OBJECTIVES

The 2001/02 Association of Breast Surgery at BASO (ABS at BASO) audit of screen detected breast cancer was undertaken to examine NHS Breast Screening Programme surgical activity in the period 1st April 2001 to 31st March 2002. The audit was designed to assess surgical performance by comparison of data with as many as possible of the surgical Quality Assurance (QA) standards recommended by the UK NHS Breast Screening Programme. These include the standards set in the following publications:

- Quality Assurance Guidelines for Surgeons in Breast Cancer Screening
  NHSBSP Publication No. 20 Revised April 1996

- Guidelines for Quality Assurance Visits
  NHSBSP Publication No. 40 Revised October 2000

Reference is also made to guidelines intended for symptomatic breast cancer:

- Guidelines for Surgeons in the Management of Symptomatic Breast Disease in the United Kingdom, European Journal of Surgical Oncology 1995, updated 1998

The audit cover the main topic areas:

- the number and invasive status of screen detected breast cancer
- pre-operative diagnosis and use of open biopsy
- surgical caseload
- treatment and size of all cancers
- adjuvant therapy
- survival audit of cases detected by screening between 1st April 1996 to 31st March 1997

ORGANISATION OF THE AUDIT

Organisation of Data Collection

As in previous years, responsibility for regional data collection was devolved to Regional QA Reference Centres under the direction of Surgical QA Co-ordinators, QA Directors and QA Co-ordinators. Prior to the start of data collection an information pack was sent to all Surgical QA Co-ordinators, QA Directors, QA Co-ordinators and Directors of regional cancer registries. This pack included, in both electronic and paper format:

- a timetable of events (Appendix 1)
- a main ABS at BASO breast audit questionnaire with guidance notes (Appendix 2)
- an adjuvant therapy data collection form with guidance notes (Appendix 3)
- a survival audit data collection form with guidance notes and survey (Appendix 4)

The format of the audit was designed by the Breast Audit Group and was subject to comment from Surgical QA Co-ordinator, QA Directors and QA Co-ordinators in an attempt to ensure that, as far as possible, ambiguities were eliminated. Guidance notes and data checks, designed to assist the collection of consistent data, were incorporated.

ABS at BASO Breast Audit Questionnaire

The ABS at BASO breast audit questionnaire was designed to enable collection of data describing surgical screening activity in the 2001/02 screening year. The cohort of women included in this period was selected to be identical to that included in the statistical KC62 reports for 2001/02, from which UK NHSBSP core screening measures are routinely calculated. Information was sought in such a way as to allow comparison of findings with current QA standards.

Screening Surgical Caseload

In order to calculate the screening caseload of every surgeon working within the UK NHSBSP, each woman was assigned the GMC code relating to her consultant surgeon to eliminate double-counting of surgeons across screening units.

Adjuvant Therapy Audit

Each screening surgeon was asked to collect information for those women with a date of first offered appointment from 1st October 2000 to 30th September 2001 inclusive. Information was sought regarding start dates for radiotherapy, chemotherapy and hormone therapy, where applicable. These data were linked to data collected in the main audit to provide information on waiting times for adjuvant therapy and patterns of treatment.

Survival Audit

The objective of the survival audit was to combine NHSBSP data for women with screen detected breast cancer with data recorded by regional cancer registries to examine survival. Where data on tumour size, grade and nodal status were available the survival profiles according to prognostic characteristics were examined. Details of the women with screen detected breast cancer diagnosed between 1st April 1996 and 31st March 1997 were obtained by the breast screening services. These cases were matched with databases held at regional cancer registries to identify the date of death for any woman who died on or before 31st March 2002. It was therefore possible to analyse survival up to 5 years post diagnosis. Relative survival was analysed using UK life tables supplied by the Government Actuary's Department with the software SURV2 (*"Surv2: Relative Survival Analysis Program", Esko T Voutilainene, Paul W. Dickman, Timo Hakulinen. Finnish Cancer Registry (Helsinki) and Dept of Medical Epidemiology, Karolinska Institutet (Stockholm).*).

RESPONSIBILITY FOR DATA COLLECTION

ABS at BASO breast audit information packs were sent to NHSBSP representatives in each NHS region in England and to Wales, Scotland and Northern Ireland. Data for the 8 English regions and data for Wales, Northern Ireland and Scotland are presented in this document. Data for two of the English regions, Northern & Yorkshire and South East have been subdivided in the audit (see the map on Page 5).

In each region the Surgical QA Co-ordinator, QA Director and QA Co-ordinator were responsible for working together to ensure that the data were collected from their breast screening services. In turn, lead surgeons in each breast screening service were responsible for making sure that the data were made available and were complete. Lead surgeons in each screening service were asked to give confirmation to their QA Co-ordinator that the data for their breast screening service were a fair representation of screening activity in the audit period (to "sign off" the data). The QA Co-ordinator in each region was given the responsibility for ensuring that data were signed off before submission.

Identifying people responsible for ensuring that data are gathered and are a true reflection of surgical work is intended to clarify ownership of the information for this audit. Ownership of the information is essential if a need for change is highlighted which must be accepted and implemented. Responsibility for survival audit data collection rested with regional Breast Screening QA Co-ordinators. Effective communication and collaboration with regional cancer registries was a vital element in the success of the survival audit.

The ground level data collection was carried out by a range of staff, from individual surgeons to QA Reference Centre staff, breast screening service office staff, staff at regional cancer registries, oncology staff, some non-surgical clinicians who have an interest in QA and some dedicated surgical data collection officers. For those screening services supported by the National Breast Screening System a set of standard analytical Co-writer reports was designed to allow the audit data to be retrieved from screening computer systems. These reports were created by Mrs Margot Wheaton and were available to all regions. Data were collated on a regional basis by QA Reference Centres under the direction of the Surgical QA Co-ordinators, QA Directors and QA Co-ordinators and submitted to the West Midlands QA Reference Centre for collation and evaluation.

OBTAINING COMPLETE AND VALID AUDIT DATA

Ensuring that audit data were supplied in a consistent format was essential to the validation process. The West Midlands QA Reference Centre developed specialist spreadsheets in Microsoft Excel which were used by each regional QA Reference Centre to collate regional data in a standard format. Individual screening services could either provide the data to their regional QA Reference Centre in the Excel spreadsheet or by hand on a paper copy. The spreadsheet included data validation checks. A specially designed spreadsheet was also provided for the survival audit. The collection of data at breast screening service/unit level involved detailed consideration of cases and cross checks against existing KC62 reports.

DATA EVALUATION

The West Midlands QA Reference Centre, guided by the Breast Audit Group, acted as the central collection and collation point for national data. During the collation of national data, extensive validation checks were used to ensure that the data were an accurate reflection of surgical activity in the UK NHSBSP. National data were evaluated in comparison to current QA standards where these were available. Commentary and recommendations have been made by the ABS at BASO Breast Audit Group.

PRESENTATION AND PUBLICATION OF AUDIT DATA

The ABS at BASO 2001/02 audit of screen detected breast cancer is published as a booklet with financial assistance from NHSBSP National Office and presented at the annual ABS at BASO meeting on 2nd April 2003 by Dr Gill Lawrence with commentary by Professor Monica Morrow.

Following the Motorcycle Museum meeting, the booklet and presentation will be available to download from the following web sites.

West Midlands Cancer Intelligence	www.wmpho.org.uk/wmciu/
NHS Cancer Screening Programmes	www.cancerscreening.nhs.uk

REFERENCING THIS DOCUMENT

This document, and the presentation, should be cited in the following way.

"An audit of screen detected breast cancers for the year of screening April 2001 to March 2002", NHSBSP, ABS at BASO, 2nd April 2003.

USING THE AUDIT DATA TO IMPROVE PERFORMANCE

Recommended uses of the ABS at BASO breast audit data are as follows:

At National Level

- The ABS at BASO breast audit data should be considered formally at a meeting of the Regional QA Directors to identify recommendations for action, where performance does not meet a QA standard. This may include suggestions for training and recommendations for the management and organisation of services.

At Local/Regional Level

- The annual ABS at BASO breast audit data should be considered formally at a meeting of the Regional QA Team and preferably also at a regional workshop where the data for individual screening units in each region are analysed and presented.

- Where the audit identifies a screening unit as an 'outlier' in a particular area, Regional QA Reference Centres and Regional QA Surgeons should encourage screening units to audit the cases involved to establish whether the results reflect a data collection or recording problem. If the data are found to represent clinical practice correctly, the reasons for the failure to follow recommended guidelines should be ascertained.

- Regional QA Reference Centres and Regional QA Surgeons should follow up any failures to meet national QA standards with individual screening units. There should be formal recording of the plans put in place to achieve each of the standards failed, and routine monitoring to ensure that action has been taken to rectify the problem

- The annual ABS at BASO breast audit data should also be used to celebrate high quality services. Attention should not only be focused on failure to meet QA standards. Achievement of standards should also be recorded and recognition for high quality work given. It is important that audits such as this do not demoralise the dedicated professionals within the breast cancer screening and treatment teams.

YOUR COMMENTS

The ABS at BASO audit of screen detected breast cancer has developed over the years, with improvements in design and organisation resulting in improved data quality and increasingly useful audit results. To continue this development process your comments and suggestions are extremely useful. If you have any comments or suggestions about the 2001/02 audit; about this document or about the development of future ABS at BASO breast audits please put them in writing to:

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PROVISION OF DATA FOR THE 2001/02 AUDIT

The map below shows the 8 NHS regions, Wales, Scotland and Northern Ireland, all of whom submitted data for the 2001/02 ABS at BASO breast audit. There are individual screening units that did not submit data for the adjuvant therapy audit.

Data for two regions, Northern & Yorkshire and South East, have been subdivided in the audit.

KEY FINDINGS AND RECOMMENDATIONS

CANCERS DETECTED BY SCREENING

1,507,987 women were screened by the UK NHSBSP in England, Wales, Northern Ireland and Scotland in the screening year 2001/02. 10191 cancers were detected in women of all ages. This equates to a cancer detection rate of 6.8 cancers per 1000 women screened.

PRE-OPERATIVE DIAGNOSIS

In 2001/02, 89% of cancers detected in the UK NHSBSP were diagnosed pre-operatively. The pre-operative diagnosis rate has increased by 42% since 1996/97. The pre-operative diagnosis rates for invasive and non-invasive cancers were 93% and 73% respectively. Three screening units achieved 100% pre-operative diagnosis. 45 screening units met or exceeded the 90% pre-operative diagnosis rate target. Only one screening unit, with 63%, failed to meet the minimum standard for pre-operative diagnosis. The regional QA reference centre and the regional QA surgeon should investigate the reasons for the low pre-operative diagnosis rate recorded by this screening unit.

Of the 1881 cancers with a B5a (Non-invasive) pre-operative diagnosis, 470 cancers (25%) were found to be invasive following surgery. Even where the core biopsy was most accurate, in South West and Scotland, 19% of B5a cases were found to have invasive disease following surgery. In London and Northern Ireland this figure was 35% and 36% respectively. These data illustrate the importance of taking into account radiological and clinical factors when making management decisions at multi-disciplinary meetings. 98% of B5b (Invasive) pre-operative diagnoses had surgical confirmation of invasive cancer. 45 cases (1%) were found to be non-invasive or micro-invasive following surgery. 92% of C5 pre-operative diagnoses were found to be invasive after surgery.

DIAGNOSTIC OPEN BIOPSIES

Due to the rising pre-operative diagnosis rate, only 1148 cancers were diagnosed by open biopsy in 2001/02. Of these, 558 (49%) were invasive, 14 (1%) micro-invasive and 569 (50%) non-invasive. For 43% of invasive cancers diagnosed by open biopsy there had been unsuccessful attempts to obtain a pre-operative diagnosis using core biopsy alone. For non-invasive cancers the proportion of cases where pre-operative diagnosis had been attempted with core biopsy alone was 69%.

The malignant open biopsy rate has fallen by 58% over the last 6 years from 1.82 per 1000 women screened in 1996/97 to 0.76 per 1000 in 2001/02. In 2001/02 the overall malignant open biopsy rate was 0.8 per 1000 women screened, varying from 0.6 per 1000 in Trent, South East (East) and West Midlands to 1.0 per 1000 in Northern Ireland. The benign open biopsy rate has remained stable since 1999/00 at around 1.3 per 1000 women screened. In 2001/02 the benign open biopsy rate was 1.3 per 1000 women screened, varying from 1.0 per 1000 in West Midlands to 1.7 per 1000 in Wales and 2.1 per 1000 in North West. It is of some concern that the benign open biopsy rates in North West and Wales, which were well above the rate for the UK as a whole in 2001/02, were both higher than they were in 2000/01. The regional QA reference centres and regional QA surgeons in North West and Wales should audit these cases to determine the reasons for the relatively high benign open biopsy rates recorded.

Of the 558 invasive cancers diagnosed by open biopsy, 50 (9%) had no pre-operative procedure recorded. Of the 569 non-invasive cancers diagnosed by open biopsy, 26 (5%) had no pre-operative procedure recorded. Regional QA reference centres and regional QA surgeons should audit these 76 cases to establish whether they reflect a data collection problem. If the data are found to represent clinical practice correctly, the reasons for the failure to attempt pre-operative diagnosis should be ascertained

Overall, 16% of invasive cancers diagnosed by open biopsy had an inadequate (C1 or B1) core biopsy or cytology sample. In the West Midlands and South East (East) this figure was 30% or more. Pre-operatively, in Yorkshire 57% of invasive cancers diagnosed by open biopsy had a C4 or B4 suspicion of malignancy, compared to 38% in the UK as a whole. In Northern Ireland and West Midlands, 47% and 24% respectively of non-invasive cancers diagnosed by open biopsy had an inadequate (C1 or B1) core biopsy or cytology sample, compared to 14% in the UK as a whole. In Wales and Yorkshire 48% and 47% respectively of non-invasive cancers diagnosed by open biopsy had a C4 or B4 suspicion of malignancy, compared to 37% in the UK as a whole. Regional QA reference centres and regional QA surgeons should audit cases diagnosed pre-operatively as C1-C4 and B1-B4 to determine the reasons for the failure to achieve a pre-operative diagnosis.

SURGICAL TREATMENT

In the UK as a whole, 1143 (14%) invasive cancers and 424 (20%) non-invasive cancers underwent more than one therapeutic operation. For invasive cancers this proportion varied from 20% in Northern, South East (East) and South West to 10% in London and Northern Ireland. For non-invasive cancers this proportion varied from 33% in South West to 9% in Northern Ireland. Overall 12% (624) of invasive cancers with a B5b (Invasive) pre-operative core biopsy sample underwent a repeat therapeutic operation. In South West this was 17%. Overall, 15% (183) invasive cancers with a pre-operative diagnosis by fine needle cytology alone underwent a repeat therapeutic operation. In South East (East) this was 30%. Overall, 41% (192) invasive cancers with a B5a (Non-invasive) pre-operative core biopsy underwent a repeat therapeutic operation. In West Midlands this was 62%.

80% of the 508 invasive cancers where core biopsy or cytology did not give a diagnosis of cancer underwent 1 or more therapeutic operations following diagnostic open biopsy. 19% underwent 2 or more therapeutic operations following diagnostic open biopsy. 36 of the 50 invasive cancers with no pre-operative procedures recorded underwent 1 or more therapeutic operations following diagnostic open biopsy. 23% (324 cases) of non-invasive and micro-invasive cancers correctly predicted by a B5a (Non-invasive) core biopsy underwent a repeat therapeutic operation, compared to 27% (23) of cases with a pre-operative diagnosis by fine needle cytology only and 20% (9) of cases where a B5b (Invasive) core biopsy predicted invasive disease.

In the UK as a whole, 55% of the 624 invasive cancers with a pre-operative diagnosis of invasive disease at core biopsy (B5b (Invasive)) that underwent two or more therapeutic operations had repeat operations that included conservation surgery. 40% (248 cases) included mastectomy and the remaining 6% (35 cases) underwent a repeat operation only to obtain axillary nodes. There was wide regional variation in the reasons for repeat operations. In the UK as a whole, 250 (5%) invasive cancers with a B5b (Invasive) pre-operative diagnosis underwent a repeat operation involving axillary nodes. For invasive cancers diagnosed pre-operatively on the basis of cytology alone (87) this proportion was 7% and for those diagnosed pre-operatively as B5a (Non-invasive) cancers (161) it was 34%. In Trent and Scotland, an axillary nodes procedure alone accounted for more than 15% of the B5b (Invasive) cancers which had 2 or more therapeutic operations. Overall, 97% of invasive cancers with a B5b (Invasive) or a C5 pre-operative diagnosis had known nodal status while only 84% of cancers with a B5a (Non-invasive) pre-operative diagnosis had known nodal status. These proportions were lowest in London (92% and 91% respectively).

Overall, 7.1% of invasive cancers with a C5 pre-operative diagnosis had their nodal status determined as a result of axillary procedures undertaken as repeat operations. This proportion was highest in South East (East) (11.5%), South West (11.9%) and Eastern (25%). In Eastern, without these additional axillary procedures, the proportion of cancers in this group with known nodal status would have been 66% rather than 87%. It would thus appear that in Eastern there is a reluctance to carry out an axillary nodal procedure at the first operation for cancers diagnosed pre-operatively by cytology alone, and that repeat operations are subsequently undertaken for a high proportion of

invasive C5 cancers in order to determine the nodal status. This policy may reflect the fact that in this region only 91% of cancers with a C5 diagnosis were found to be invasive after surgery and it would be interesting to look at individual screening unit data to see if this explanation is correct. South West and South East (East) appear to achieve their very high pre-operative diagnosis rates for C5 by carrying out a repeat procedure on a proportion of women from whom they did not take nodes at the first operation. It would be interesting to look at the radiological and clinical information available for these women that informed the initial decision not to take nodes since in these regions 95-96% of cancers with a C5 pre-operative diagnosis are found to be invasive after surgery.

Only 84% of invasive cancers with B5a (Non-invasive) diagnosis at core biopsy had nodal status known, and of the cancers with known nodal status, 40% had their status determined as a result of axillary procedures undertaken as repeat operations. This proportion was highest in West Midlands (55%), Wales (49%) and Scotland (48%). In all of these regions the proportion of B5a (Non-invasive) cancers with known nodal status was over 95%. In London and North West, where the proportion of B5a (Non-invasive) cancers with nodal status was between 70% and 71%, repeat operation rates were lower than in other regions (27% and 30% respectively). It would therefore appear that there is an unwillingness in these regions to carry out a repeat operation to determine the nodal status and that as a result, a proportion of women may have been under diagnosed. It would be interesting to examine the sizes of the tumours without nodal status to see if this was a factor influencing these management decisions.

28 high grade multi-focal and 19 large multi-focal non-invasive cancers were treated with conservation surgery. A further 82 potentially high grade multi-focal cancers which were treated with conservation surgery may have been undertreated because of a lack of diagnostic data relating to disease extent and/or tumour grade. Regional QA reference centres and regional QA surgeons should audit these cases to ascertain the reasons for lack of relevant diagnostic information. The variation in treatment for non-invasive cancers will be examined in more detail as part of the Sloane Project, launched at the ABS at BASO meeting in April 2003.

In the UK as a whole, 70% of invasive breast cancers detected by the UK NHSBSP in 2001/02 underwent conservation surgery. Overall mastectomy rates increased according to the invasive tumour size, with 84% of 50+mm tumours being treated with mastectomy compared with 21% of small (<15mm) invasive tumours. The mastectomy rate for small (<15mm) invasive tumours rose risen slightly to 21% in 2001/02. For small tumours only 15% of tumours with whole size <15mm were treated with mastectomy compared with 21% of tumours with invasive size <15mm. This suggests that the presence of *in situ* disease accounted for a proportion of the mastectomies performed on tumours with invasive size <15mm. These differences were less marked in North West and Scotland, suggesting that in these regions the presence or absence of *in situ* disease may have less influence on the decision to undertake a mastectomy than in other parts of the UK

LYMPH NODES AND INVASIVE GRADE

Overall, nodal status was known for 94% of invasive cancers, varying from 86% in London to 99% in Yorkshire and Scotland. The mean and median number of nodes examined were highest in Northern Ireland (17 and 15 respectively) and lowest in Northern and Trent (9 and 7 respectively in both units). 25% of cancers had positive nodal status. There was considerable regional variation in lymph node status with the proportion of node positive cancers varying from 18% in Northern to 30% in South West. Regional QA reference centres and regional QA surgeons should audit the cases from units at the extreme ends of this distribution to ascertain the reasons for these unusual results.

3.7% of invasive cancers for which nodal status was recorded had negative status determined on the basis of fewer than 4 nodes without a sentinel procedure. This varied from 0.7% in Northern

Ireland (1 cancer) to 6.6% (23 cancers) in Northern. Some of the 100 cases coded with sentinel node procedures were in units not participating in the ALMANAC trial. Regional QA reference centres and regional QA surgeons should review these cases to ascertain whether or not screening units are undertaking sentinel node procedures outwith the recommended trial setting. 24% of non-invasive cancers had known nodal status. 9 non-invasive cases had positive nodal status. Regional QA reference centres and regional QA surgeons should audit these cases to ensure that the data are accurate. 33% of invasive cancers detected by the UK NHSBSP in 2001/02 were Grade I.

SURGICAL CASELOAD

There were 439 surgeons working in the UK NHSBSP in 2001/02. 68% of women with screen detected breast cancer were treated by a surgeon with a caseload of at least 30 screening cases. This shows that surgical specialisation is advanced in the UK NHSBSP. Surgical specialisation was most advanced in West Midlands, South East (West) and Northern Ireland, where less than 20% of surgeons treated fewer than 10 cases. 156 surgeons (36%) had a screening surgical caseload of less than 10 cases. No information was available to explain the low screening caseload recorded for 52 surgeons (33%). 19 of these worked in London, 8 in South East (East) and 8 in North West. Regional QA reference centres and regional QA surgeons should audit these cases to ascertain the reasons for treatment apparently being undertaken by low caseload surgeons.

ADJUVANT THERAPY

In the UK as a whole, 63% of cases underwent surgery within 30 days of assessment. This varied between 37% in South East (East) and 92% in Northern Ireland. This result does not compare favourably with the new waiting times targets which require 100% of women to have their first treatment within 4 weeks of the date of their diagnosis. 32% of cases received radiotherapy within 60 days of first surgery, 65% within 90 days and 85% within 120 days. The proportion receiving radiotherapy within 60 days varied from 11% in South East (East), 17% in North West and 19% in South East (East) to 47% in South West and Scotland and 49% in Trent. 37% of cases received radiotherapy within 60 days of final surgery. This varied between 13% in South East (East) and 58% in Trent. In the UK as a whole only 133 women (4%) started their radiotherapy within 30 days of their first surgery. It would be interesting to identify within this group, women having a single conservative surgical operation so that an assessment can be made of the proportion whose treatment was in line with the targets set in the Joint Council for Clinical Oncology's report (published in July 1993) on reducing delays in cancer treatment.

79% of cases received chemotherapy within 60 days of first surgery, varying from 54% in Northern to 94% in Northern Ireland. Overall, 579 cases (12%) commenced hormonal therapy before surgery. The practice of starting women on hormonal therapy before surgery was most prevalent in South West (29%), South East (East) (26%) and West Midlands (23%). Recently, this practice has been questioned because of the potential thromboembolic effects of tamoxifen. In addition, it is possible that the ER status had not been determined before tamoxifen treatment was started. In regions where women are most frequently started on hormone therapy before surgery, QA reference centres and QA surgeons should raise these issues with their screening units.

3603 (51%) of the 7115 cases with complete radiotherapy and chemotherapy data underwent one or more operations followed by radiotherapy. This was the most popular order of treatments in all regions. The median time in days from assessment to final therapy was 36 days for women undergoing surgery alone, compared to 104 days for assessment to surgery followed by radiotherapy and 210 days for assessment to surgery followed by chemotherapy followed by radiotherapy.

10% of conservatively treated invasive cancers and 54% of conservatively treated non-invasive cancers did not receive radiotherapy. This difference probably arises because the potential benefits

of radiotherapy for women with conservatively treated non-invasive breast cancer have only recently been reported. The proportion of conservatively treated invasive cancers not receiving radiotherapy varied from 4% in Wales to 12% in London and 14% in South East (East), South East (West) and North West. Regional differences were more marked for non-invasive cancers, with the proportions not receiving radiotherapy varying from 33% in Northern and 32% in Scotland to 64% in South East (West) and 66% in South East (East).

16% of ER negative, node positive invasive cancers and 54% of ER negative, node negative invasive cancers did not receive chemotherapy. The latter varied from 27% in Northern Ireland to 84% in London. It would be interesting to examine the grade of the ER negative, node negative tumours to see if this was a factor influencing the decision to give chemotherapy to these women. 7% of invasive cancers had unknown ER status, varying from 1% in Northern Ireland and Scotland to 22% in Northern and 23% in Wales. 62% of non-invasive cancers had unknown ER status, varying from 32% in Northern to 98% in Wales. Given the importance of ER status in determining management decisions, regional QA reference centres and regional QA surgeons should actively encourage their screening units to obtain this information.

6% of ER positive, invasive cancers did not receive hormonal therapy. In London, Wales, Northern and Trent between 12% and 17% of women with ER positive invasive tumours did not receive hormonal therapy. Given the proven benefits of hormone treatment for women with ER positive cancers, regional QA reference centres and regional QA surgeons should audit these cases to ascertain the reasons why hormone therapy was not prescribed. 18% of ER negative cancers received hormonal therapy, varying between 2% in Trent and 33% in Wales. In view of the emerging data concerning the possible complications associated with the use of Tamoxifen, regional QA reference centres and regional QA surgeons should encourage their screening units to carefully review their policies relating to the prescribing of Tamoxifen to women with ER negative tumours.

SURVIVAL

The overall 5 year relative survival for invasive screen detected breast cancers diagnosed between 1st April 1996 and 31st March 1997 was 95.4% (95% CI 94.6% - 96.2%). A clear relationship between survival and tumour size, grade and nodal status was apparent with the highest relative survival rates being seen in women with small 1-9mm tumours, Grade I tumours and tumours with negative nodes. Overall, invasive tumours in the Nottingham Prognostic Index (NPI) excellent prognostic group (EPG) had the highest 5 year relative survival rate (100.5% (95% CI 99.3%-101.7%). By definition, all EPG tumours are node negative, Grade I and have diameter $\leq$20mm. These are the types of tumours that the screening programme endeavours to detect. In 1996/97, 26% of tumours with known NPI status fell into this prognostic group. Overall in the UK, there were 41 deaths amongst women diagnosed with micro-invasive or non-invasive breast cancer. Whilst a small number of non-cancer deaths would be expected in these women, regional QA reference centres, regional QA surgeons and regional cancer registries should audit the deaths in these women to ensure that the details of these tumours and the causes of death of the women have been recorded correctly.

RESULTS OF THE 2001/02 AUDIT OF SCREEN DETECTED BREAST CANCERS

Detailed tables giving full audit results are provided in Appendices 5, 6, & 7 starting on p95

DATA RELATING TO BREAST CANCERS DETECTED IN WOMEN OF ALL AGES DURING THE PERIOD 1ST APRIL 2001 - 31ST MARCH 2002

1. ALL BREAST CANCERS DETECTED BY THE UK NHSBSP IN 2001/02

1.1 Number and Invasive Status of Screen Detected Breast Cancers and Total Women Screened

The 2001/02 BASO breast audit examined surgical screening activity undertaken for the 1,507,987 women screened in England, Wales, Northern Ireland and Scotland between 1st April 2001 and 31st March 2002. All 10191 cancers detected by the UK NHSBSP in women of all ages were examined. This equates to a cancer detection rate of 6.8 cancers per 1000 women screened. Figure 1 shows the invasive status of these 10191 breast cancers. Overall, 7911 (78%) were invasive, 2109 (21%) non-invasive and 109 (1%) micro-invasive. The invasive status of 62 cancers was unknown. 15 (24%) of these were in Eastern and 10 (16%) in London.

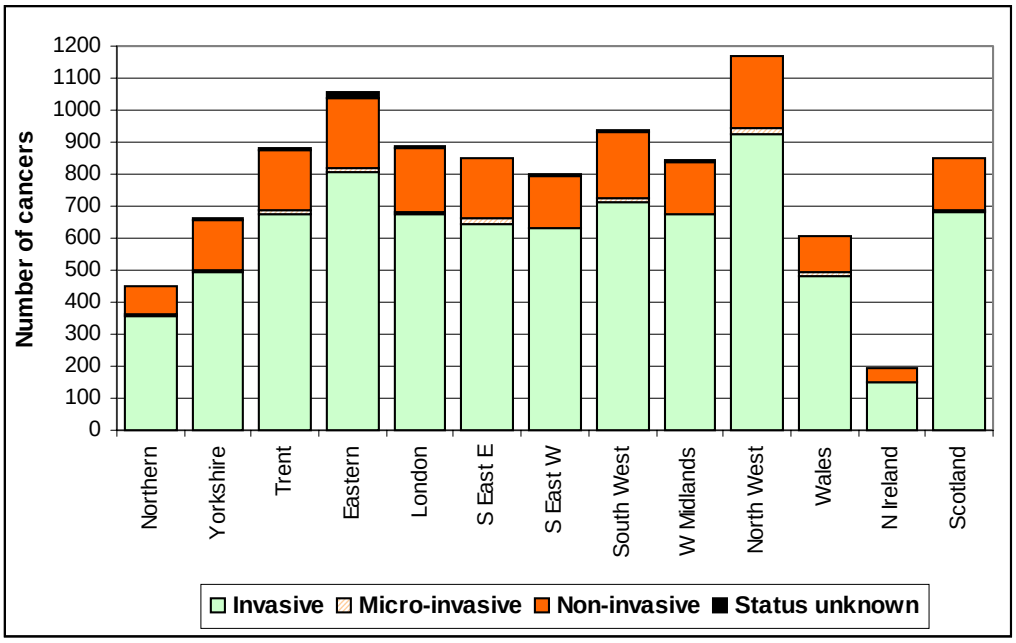

Figure 1 (Table 1) : Variation in the number and invasive status of screen detected breast cancers in each region and country contributing to the 2001/02 BASO breast audit

The UK invasive cancer detection rate was 5.2 per 1000 women screened, varying between 4.6 per 1000 in Northern and 6.6 per 1000 in Wales.

The UK non-invasive cancer detection rate of 1.5 per 1000 women screened includes both non-invasive and micro-invasive cancers. This rate varied from 1.2 per 1000 women screened in Northern and West Midlands to 1.7 per 1000 in South East (East) and Wales.

Figure 2 shows the cancer detection rate in each screening unit according to invasive status. There was a 16-fold difference (from 0.2 per 1000 to 3.4 per 1000) in the non-invasive cancer detection rate between screening units. For two screening units the non-invasive cancer detection rate was less than 0.5 non-invasive cancers per 1000 women screened. Both of these screening units screened fewer than 9,000 women during 2001/02, the minimum number suggested in NHSBSP Publication 52, "Organising a Breast Screening Programme".

In Figure 2, as with all others depicting individual screening unit data, Scotland appears as one unit, and is not divided into 6 screening centres.

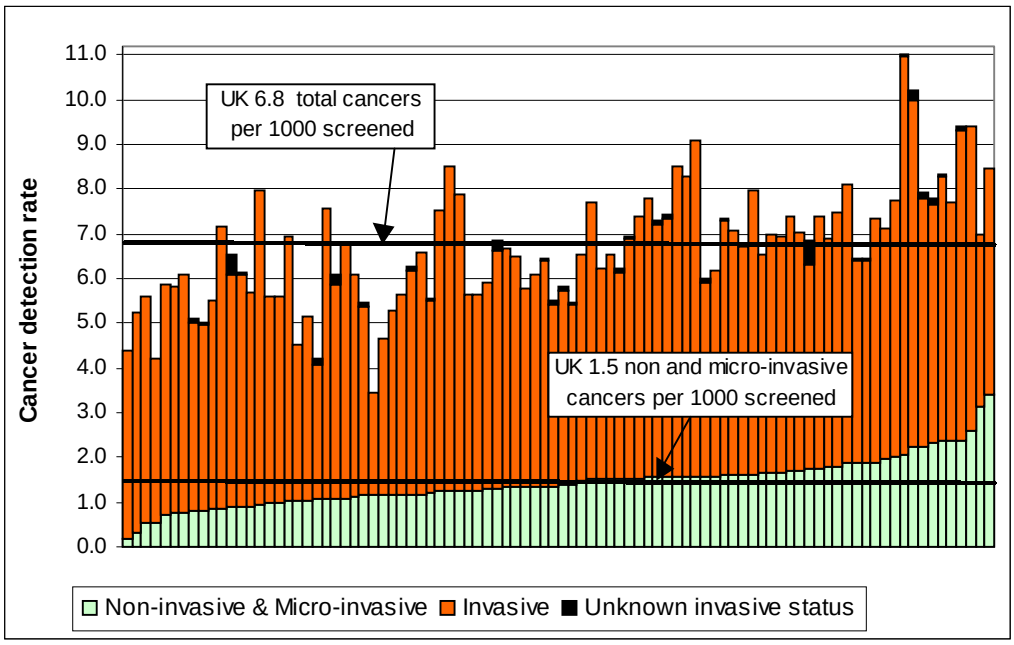

Figure 2 : Variation by screening unit in the overall cancer detection rate expressed as the number of cancers detected per 1000 women screened

The following table shows that cancer detection rates have risen steadily since 1996/97. The non-invasive cancer detection rate has risen by 34% and the invasive cancer detection rate has risen by 20% since 1996/97.

6 YEAR COMPARISON: NUMBER OF CANCERS DETECTED					
Year of data collection	*Number of invasive cancers*	*Number of non-invasive and micro-invasive cancers*	*Number of women screened*	*Cancer detection rates per 1000 women screened*	
				Invasive	*Non-invasive*
1996/97	*5860*	*1468*	*1,340,175*	*4.4*	*1.1*
1997/98	*6427*	*1726*	*1,419,287*	*4.5*	*1.2*
1998/99	*6200*	*1634*	*1,308,751*	*4.7*	*1.2*
1999/00	*7675*	*2076*	*1,550,285*	*5.0*	*1.3*
2000/01	*7945*	*2080*	*1,535,019*	*5.2*	*1.4*
2001/02	*7911*	*2218*	*1,507,987*	*5.2*	*1.5*

Data from Scotland are absent in 1998/99

2. DIAGNOSIS OF CANCERS

The following are mutually exclusive diagnostic categories into which all screen detected breast cancers fall:

DIAGNOSTIC CATEGORIES		
Pre-operative diagnosis by C5 cytology or malignant core biopsy (B5)	Malignant open biopsy	Clinical and/or radiological grounds only, referred direct to treatment

The UK NHSBSP definition of a non-operative diagnosis is a diagnosis by C5 cytology or B5 core biopsy. Although "non-operative" is becoming the accepted terminology in the NHSBSP, core biopsy and cytology were referred to as pre-operative procedures in the 2001/02 audit documentation (see Appendix 2) and therefore the term "pre-operative diagnosis" is used throughout this document.

Other than cancers diagnosed by diagnostic open biopsy, the only remaining diagnostic category is that of diagnosis on radiological and/or clinical grounds alone. Such cancers are rare in the UK NHSBSP. They are only included in Table 2 of this audit, which shows there were 7 such cancers in 2001/02. Three of these (43%) were in London.

2.1 Pre-operative Diagnosis

2.1.1 Pre-operative Diagnosis Rate for All Cancers

Quality Objective: To ensure that the majority of breast cancers receive a non-operative tissue diagnosis of cancer

Minimum Standard: ≥70% of breast cancers should have a pre-operative diagnosis by fine needle cytology or needle histology.

Target Standard: ≥90% of breast cancers should have a pre-operative diagnosis by fine needle cytology or needle histology.

(Guidelines on Quality Assurance Visits NHSBSP Publication No. 40)

In 2001/02, 89% of cancers detected in the UK NHSBSP were diagnosed pre-operatively. The following table shows that the pre-operative diagnosis rate has risen year on year, increasing by 42% since 1996/97.

6 YEAR COMPARISON: PRE-OPERATIVE DIAGNOSIS RATES							
Year	*Total cancers*	*Number of cancers with C5 and/or B5*	*% with pre-operative diagnosis by*				*Pre-operative diagnosis rate (%)*
			C5 only	*C5 and B5*	*C5 (+/- B5)*	*B5 only (no C5)*	
1996/97	*7310*	*4576*	*-*	*-*	*45*	*17*	*63*
1997/98	*8215*	*5866*	*-*	*-*	*42*	*29*	*71*
1998/99	*8002*	*6449*	*-*	*-*	*36*	*44*	*81*
1999/00	*8906*	*7590*	*-*	*-*	*31*	*54*	*85*
2000/01	*10079*	*8775*	*19*	*8*	*-*	*60*	*87*
2001/02	*10191*	*9043*	*13*	*9*	*-*	*66*	*89*

Data from Scotland are absent in 1998/99 and 1999/00

This rise in pre-operative diagnosis rate has been accompanied by a 3-fold increase (from 17% to 66%) in the proportion of cancers diagnosed by B5 core biopsy alone. The proportion of cases diagnosed solely by C5 cytology decreased from 19% in 2000/01 to 13% in 2001/02, the two years for which these data were available.

Figure 3 shows the pre-operative diagnosis rate by C5 cytology, by both C5 cytology and B5 core biopsy and by B5 core biopsy alone. All regions met the pre-operative diagnosis rate 70% minimum standard. Trent (92%), Wales (92%), South East (East) (91%) exceeded the 90% target. Three further regions had a pre-operative diagnosis rate of 90% (West Midlands (90.3%), Eastern (89.6%) and South West (89.6%)). The lowest pre-operative diagnosis rates were recorded in Northern (84%), South East (West) (85%) and Northern Ireland (85%). Northern and Northern Ireland were unusual in achieving 30% or more of their pre-operative diagnoses using cytology alone. The relatively high level of pre-operative diagnosis by cytology alone in Northern is believed to be explained in part by the policy of some screening units to selectively restrict the use of core biopsy to cancers with visible micro-calcification. In Scotland, 35% of pre-operative diagnoses were made on the basis of cytology and core biopsy.

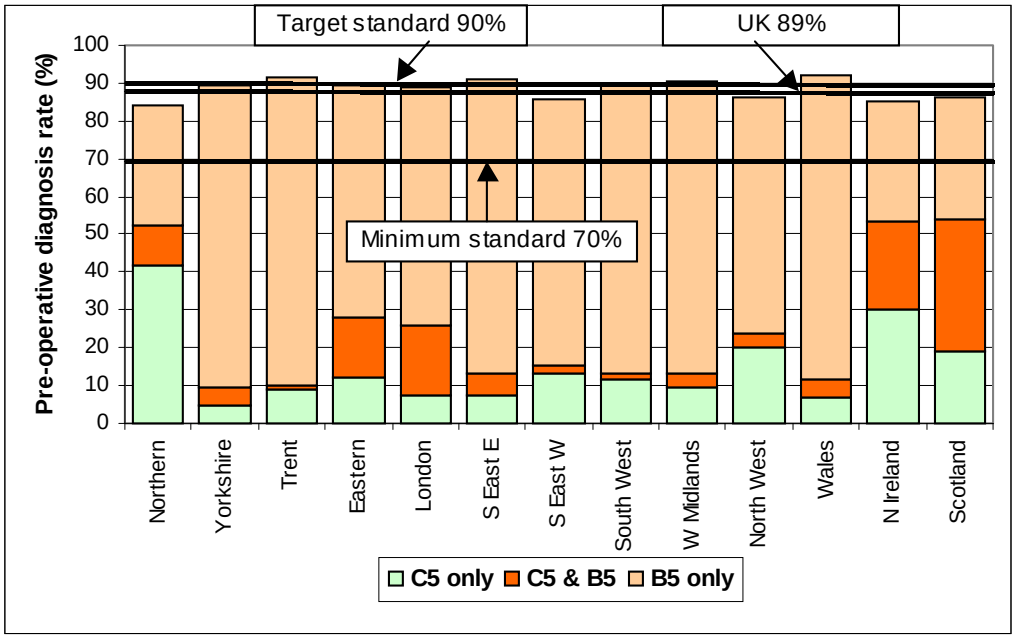

Figure 3 (Table 3) : Variation in pre-operative diagnosis rate and the proportion of cancers detected by cytology alone, core biopsy alone or cytology and core biopsy, as a percentage of cancers detected

Figure 4 shows the pre-operative diagnosis rates achieved by individual screening units. Three units (with 22, 44 and 50 cancers detected) achieved 100% pre-operative diagnosis. In total, 45 units had pre-operative diagnosis rates which met or exceeded the 90% target, more than the third of units expected to achieve a target standard.

Only one screening unit, with 63%, failed to meet the 70% minimum standard for pre-operative diagnosis. This unit detected 73 cancers, of which 46 had a pre-operative diagnosis. Of the 27 cancers without a pre-operative diagnosis, 12 had no pre-operative procedures recorded. The regional QA reference centre and the regional QA surgeon should investigate the reasons for the low pre-operative diagnosis rate recorded by this screening unit.

The minimum standard for the pre-operative diagnosis rate that all units are expected to achieve, may rise from 70% to 80% in 2004/05. In 2001/02 only 7 units had pre-operative diagnosis rates below 80%.

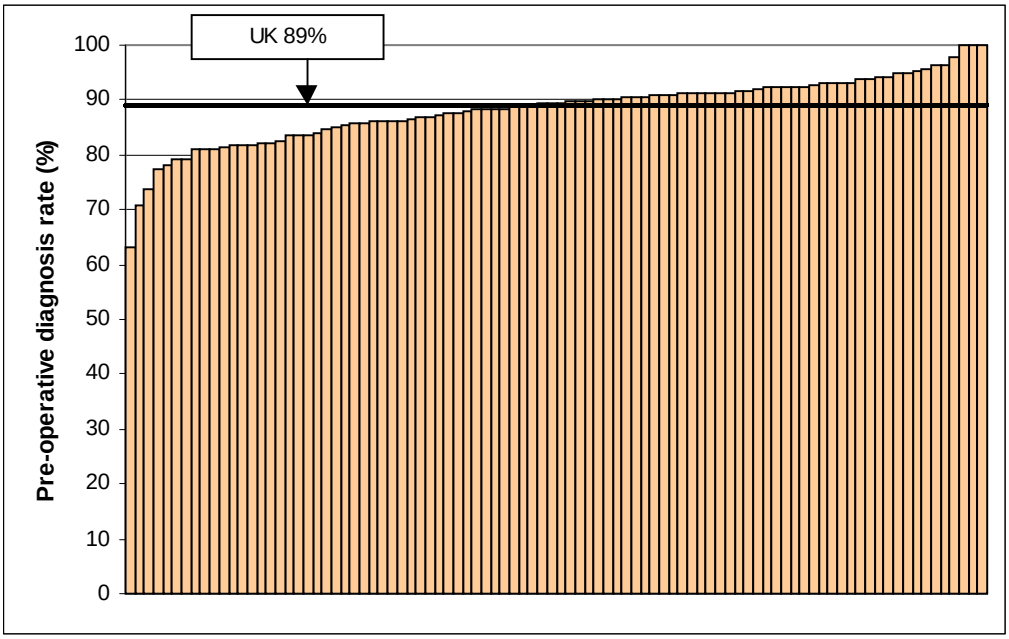

Figure 4 : Variation by screening unit in pre-operative diagnosis, expressed as a % of cancers detected

2.1.2 Pre-operative Diagnosis Rate for Invasive and Non-invasive Cancers

The 70% minimum standard for pre-operative diagnosis applies to all cancers. Overall the pre-operative diagnosis rates for invasive and non-invasive cancers were 93% and 73% respectively. Figure 5 shows the regional variation in these pre-operative diagnosis rates. The invasive pre-operative diagnosis rate varied from 89% in Northern and Scotland to 96% in Yorkshire and Trent. The non-invasive pre-operative diagnosis rate varied from 58% in Northern Ireland to 80% in Wales.

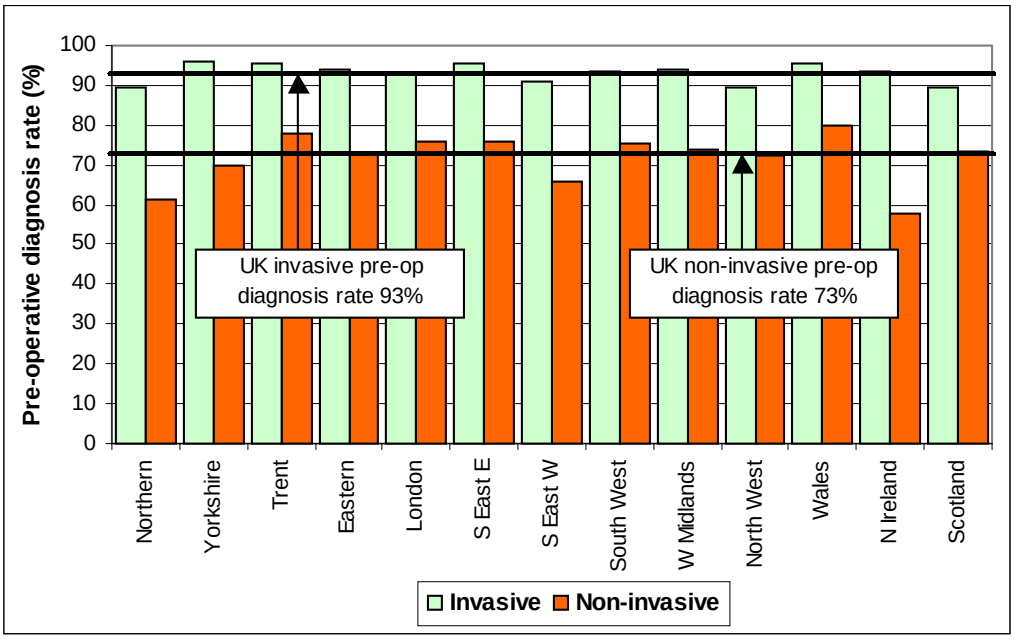

Figure 5 (Table 4,5) : Variation by region in pre-operative diagnosis rates for invasive cancers and non-invasive cancers

COMMENT:

- In 2001/02, 89% of cancers detected in the UK NHSBSP were diagnosed pre-operatively. The pre-operative diagnosis rate has increased by 42% since 1996/97. The pre-operative diagnosis rates for invasive and non-invasive cancers were 93% and 73% respectively.
- Three screening units achieved 100% pre-operative diagnosis. 45 screening units met or exceeded the 90% pre-operative diagnosis rate target.
- Only one screening unit, with 63%, failed to meet the minimum standard for pre-operative diagnosis. The regional QA reference centre and the regional QA surgeon should investigate the reasons for the low pre-operative diagnosis rate recorded by this screening unit.

2.1.3 Invasive Status at Pre-operative Core Biopsy

Screening units were asked to supply the invasive status at core biopsy for those cancers with a B5 diagnosis. This is either B5a (Non-invasive), B5b (Invasive) or B5c (Not assessable).

Of the 7694 cancers with a B5 diagnosis, 1881 (24%) were B5a (Non-invasive), 5405 (70%) were B5b (Invasive) and 32 cancers had invasive status B5c (Not assessable) at core biopsy. Data on the invasive status at core biopsy were unavailable for 376 (5%) of cases with a B5 diagnoses, of which 210 (56%) were in London, 57 (15%) in North West and 54 (14%) in South East (East). Figure 6 shows the variation by region in the invasive status at core biopsy.

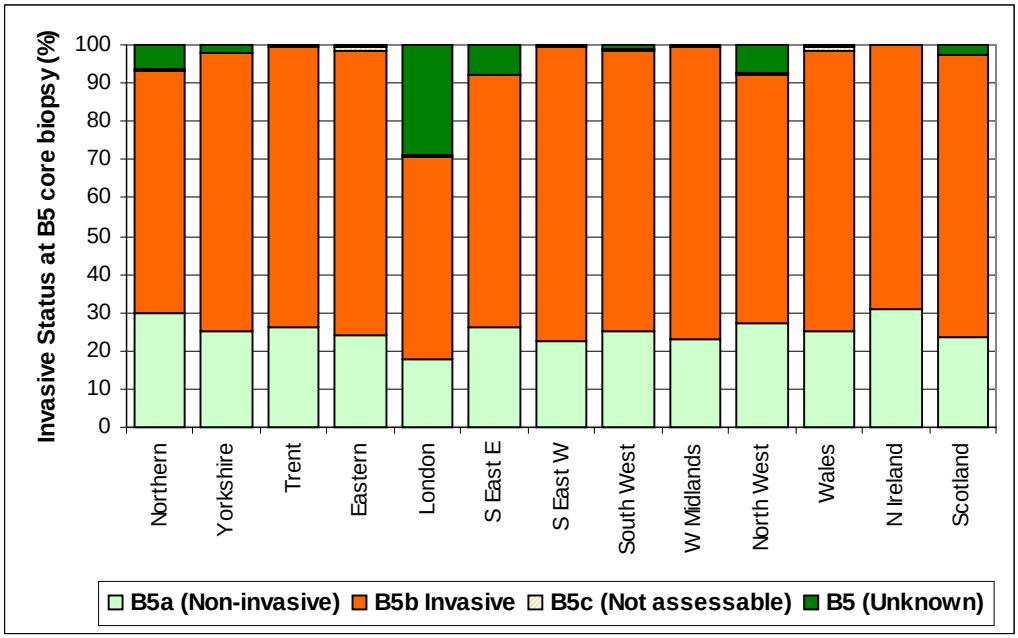

Figure 6 (Table 6): Variation in the proportion of cancers with B5a (Non-invasive), B5b (Invasive) and B5c (Not Assessable) core biopsy diagnosis, expressed as a percentage of cancers diagnosed by core biopsy

2.1.4 Invasive Status at Pre-operative Core Biopsy Compared with Invasive Status After Surgery

The majority of cancers diagnosed by core biopsy go on to have surgery, at which a definitive invasive status is determined. Figure 7 shows, for each region, invasive status after surgery of the cases with a B5a (Non-invasive) pre-operative diagnosis. Of the 1881 cancers with a B5a (Non-invasive) pre-operative diagnosis, 1321 (70%) had surgical confirmation of non-invasive cancer, the invasive status predicted by core biopsy and 72 (4%) had a diagnosis of micro-invasive cancer following surgery. A further 15 cases (1%) had no surgery so the pre-operative diagnosis of non-invasive cancer was retained and for 3 cases with a B5a, the final invasive status was unknown.

For 470 cancers (25%) with a B5a pre-operative diagnosis, invasive disease was found at surgery. Even in South West and Scotland, where the core biopsy was most accurate, 19% of B5a cases were found to have invasive disease following surgery. In London and Northern Ireland this figure was 35% and 36% respectively. These data illustrate the importance of taking into account radiological and clinical factors when making management decisions at multi-disciplinary meetings.

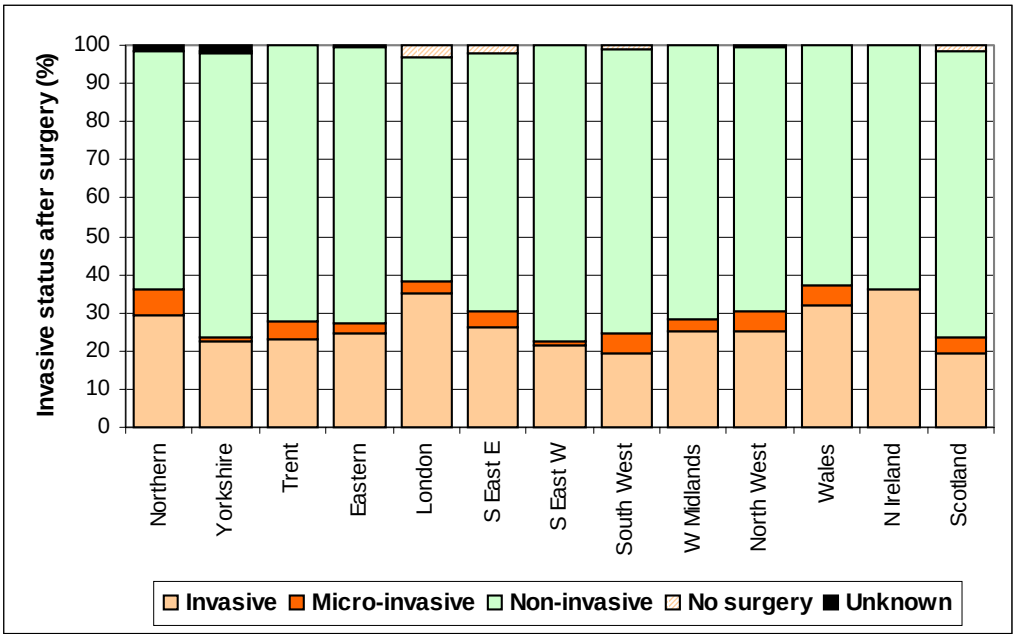

Figure 7 (Table 7) : Variation in the invasive status after surgery of cases with B5a (Non-invasive), expressed as a percentage of cancers diagnosed with B5a

Of the 5405 cancers with a B5b (Invasive) pre-operative diagnosis, 5287 (98%) had surgical confirmation of invasive cancer, the invasive status predicted by core biopsy. These data are shown for each region in Table 8. In the UK as a whole, 72 (1%) of these cases had no surgery recorded, so the invasive status of the core biopsy was retained. In Eastern (17 cases) and London (10 cases) this proportion was 3%. A further, 45 cases (1%) were found to have non-invasive or micro-invasive cancer following surgery. 8 of these were in Eastern, 7 in Trent and 7 in South East (East).

2.1.5 Invasive Status of Cancers Diagnosed by C5 Cytology Only

Table 9 shows the invasive status of the 1349 cancers diagnosed by cytology only. This does not include the cases diagnosed by both C5 and B5. Overall, 92% of cancers diagnosed by C5 alone were invasive, varying from 83% in Wales to 97% in Yorkshire. In the UK as a whole, 76 cancers (6%) were non-invasive and 9 (1%) micro-invasive. The invasive status of 18 cancers (1%) was unknown. In London this proportion was 6% (4 cancers).

COMMENT:

- Of the 1881 cancers with a B5a (Non-invasive) pre-operative diagnosis, 470 cancers (25%) were found to be invasive following surgery.
- Even where the core biopsy was most accurate, in South West and Scotland, 19% of B5a cases were found to have invasive disease following surgery. In London and Northern Ireland this figure was 35% and 36% respectively. These data illustrate the importance of taking into account radiological and clinical factors when making management decisions at multi-disciplinary meetings.
- 98% of B5b (Invasive) pre-operative diagnoses had surgical confirmation of invasive cancer. 45 cases (1%) were found to be non-invasive or micro-invasive following surgery.
- 92% of C5 pre-operative diagnoses were found to be invasive after surgery.

2.2 Diagnostic Open Biopsies

2.2.1 Status of Diagnostic Open Biopsies

Figure 8 shows the regional variation in benign and malignant diagnostic open biopsy rates. In the UK as a whole, 3166 diagnostic open biopsies were performed, of which 2018 (64%) were benign and 1148 (36%) were malignant.

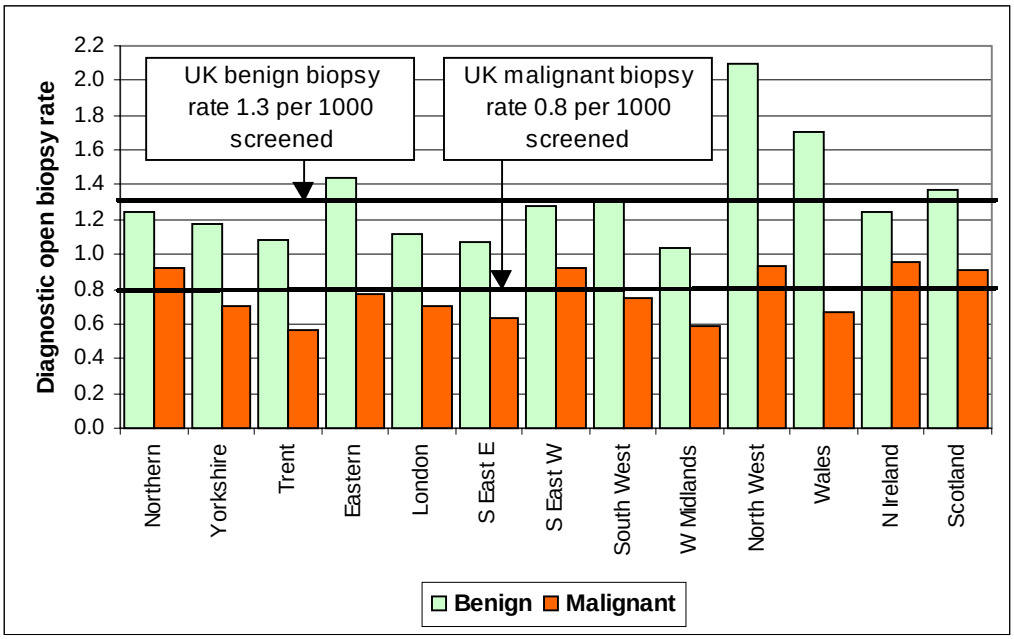

Figure 8 (Table 10) : Variation in benign and malignant diagnostic open biopsy rates expressed as the number of diagnostic open biopsies undertaken per 1000 women screened

The benign open biopsy rate was 1.3 per 1000 women screened, varying from 1.0 per 1000 in West Midlands to 1.7 per 1000 in Wales and 2.1 per 1000 in North West. It is of some

concern that the benign open biopsy rates in North West and Wales, which were well above the rate for the UK as a whole in 2001/02, were both higher than they were in 2000/01. In the North West in 2000/01, 303 women were recorded as having a benign diagnostic open biopsy (1.9 per 1000 women screened), compared with 360 in 2001/02. In Wales there were 99 benign diagnostic open biopsies in 2000/01 (1.3 per 1000) compared with 124 in 2001/02. The regional QA reference centres and regional QA surgeons in North West and Wales should audit these cases to determine the reasons for the relatively high benign open biopsy rates recorded.

Overall, the malignant open biopsy rate was 0.8 per 1000 women screened, varying from 0.6 per 1000 in Trent, South East (East) and West Midlands to 1.0 per 1000 in Northern Ireland.

The summary table below shows that the benign open biopsy rate has remained stable since 1999/00 at around 1.3 per 1000 women screened. The malignant open biopsy rate has fallen by 58% over the last 6 years from 1.82 per 1000 women screened in 1996/97 to 0.76 per 1000 in 2001/02.

6 YEAR COMPARISON:
BENIGN AND MALIGNANT DIAGNOSTIC OPEN BIOPSY RATES

Year of data collection	*Number of women screened*	*Number of benign open biopsies*	*Number of malignant open biopsies*	*Benign open biopsy rate per 1000 women screened*	*Malignant open biopsy rate per 1000 women screened*
1996/97	*1,340,175*	*2015*	*2441*	*1.50*	*1.82*
1997/98	*1,419,287*	*2251*	*2349*	*1.59*	*1.66*
1998/99	*1,308,751*	*1830*	*1553*	*1.40*	*1.19*
1999/00	*1,429,905*	*1838*	*1316*	*1.29*	*0.92*
2000/01	*1,535,019*	*2042*	*1304*	*1.33*	*0.85*
2001/02	*1,507,987*	*2018*	*1148*	*1.34*	*0.76*

Data from Scotland are absent in 1998/99 and 1999/00

2.2.2 Pre-operative Histories for Cancers Diagnosed by Diagnostic Open Biopsy

Due to the rising pre-operative diagnosis rate, only 1148 cancers were diagnosed by open biopsy in 2001/02. Of these, 558 (49%) were invasive, 14 (1%) micro-invasive and 569 (50%) non-invasive. Invasive status was unknown for 7 cases. These data are shown by region in Table 11.

Table 12 describes the pre-operative history of the cancers diagnosed by open biopsy according to whether the women had no pre-operative cell or tissue sample, cytology only, core biopsy only or both cytology and core biopsy. This information is shown by invasive status in Tables 13 and 14. For 43% of invasive cancers diagnosed by open biopsy there had been unsuccessful attempts to obtain a pre-operative core diagnosis using core biopsy alone (Table 13). For non-invasive cancers the proportion of cases where pre-operative diagnosis had been attempted with core biopsy alone was higher at 69% (Table 14).

Table 13 also shows that, of the 558 invasive cancers diagnosed by open biopsy, 50 (9%) had no pre-operative procedure recorded. 13 (24%) of these were in North West and 12 (24%) were in Scotland. Of the 569 non-invasive cancers diagnosed by open biopsy, 26 (5%) had no pre-operative procedure recorded. 5 (19%) of these were in Scotland 4 (15%) were in Trent and 4 (15%) were in London (Table 14). Regional QA reference centres and regional QA surgeons should audit the 76 cases diagnosed by open biopsy that had no pre-operative

procedure recorded to establish whether they reflect a data collection problem. If the data are found to represent clinical practice correctly, the reasons for the failure to attempt pre-operative diagnosis should be ascertained.

The highest cytology and core biopsy results were recorded for each of the malignant diagnostic open biopsies. These data are shown for each region in Table 15. Figure 9 shows the highest pre-operative diagnosis result for cancers ultimately determined to be invasive. Overall, 16% of invasive cancers diagnosed by open biopsy had an inadequate (C1 or B1) core biopsy or cytology sample, varying from 5% in Yorkshire to 30% in West Midlands and 33% in South East (East). Pre-operatively, in Yorkshire 57% of invasive cancers diagnosed by open biopsy had a C4 or B4 suspicion of malignancy, compared to 38% in the UK as a whole. In Northern Ireland, 40% of invasive cancers diagnosed by open biopsy had a pre-operative diagnosis of benign disease (C3 or B3), compared to 20% in the UK as a whole. Regional QA reference centres and regional QA surgeons should audit invasive cases diagnosed pre-operatively as C1-C4 and B1-B4 to determine the reasons for the failure to achieve a pre-operative diagnosis.

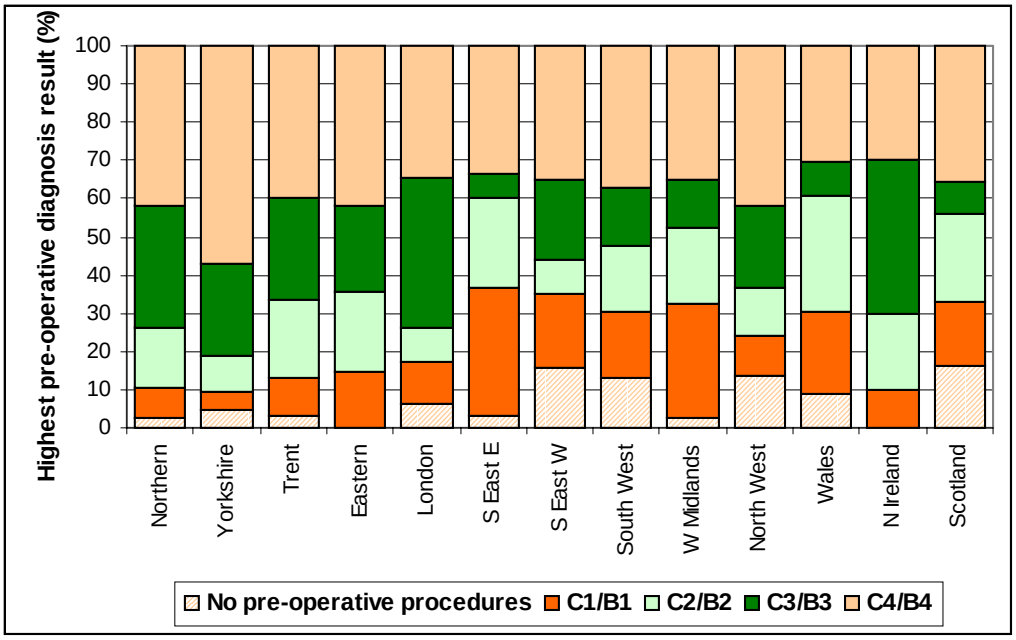

Figure 9 (Table 16) : Variation by region in the highest pre-operative diagnosis result for invasive cancers diagnosed by open biopsy, expressed as a percentage of invasive malignant diagnostic open biopsies

Figure 10 shows the highest pre-operative diagnosis result for cancers ultimately determined to be non-invasive. In Northern Ireland and West Midlands, 47% and 24% respectively of non-invasive cancers diagnosed by open biopsy had an inadequate (C1 or B1) core biopsy or cytology sample, compared to 14% in the UK as a whole. In Wales and Yorkshire 48% and 47% respectively of non-invasive cancers diagnosed by open biopsy had a C4 or B4 suspicion of malignancy, compared to 37% in the UK as a whole. Regional QA reference centres and regional QA surgeons should audit non-invasive cases diagnosed as C1-C4 and B1-B4 to ascertain the reasons that these diagnoses were obtained pre-operatively and to see if any aspects of the diagnostic process can be improved to further increase pre-operative diagnosis rates.

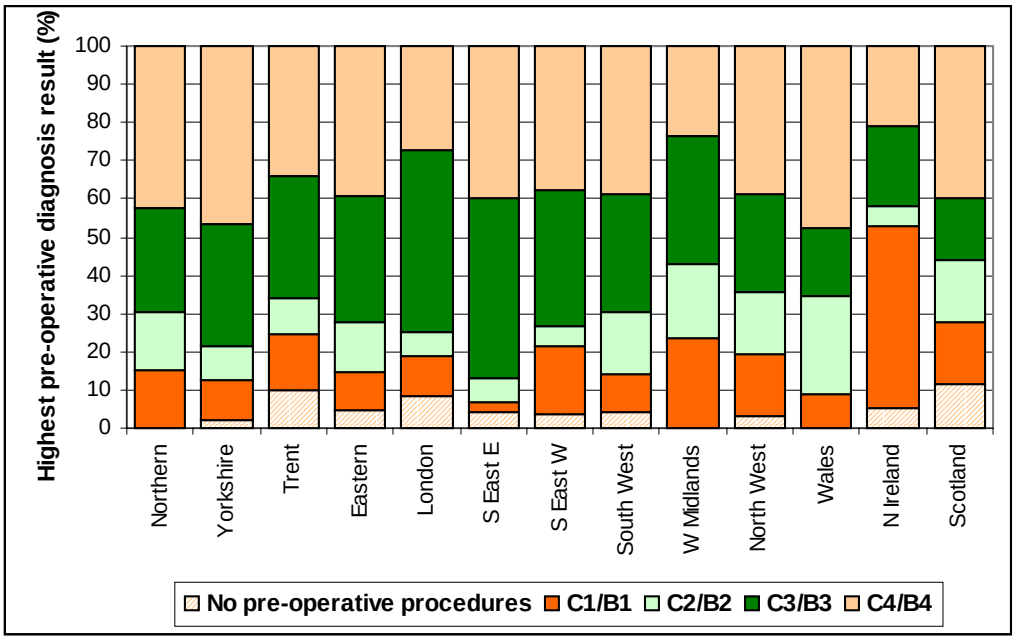

Figure 10 (Table 17) : Variation by region in the highest pre-operative diagnosis result for non-invasive cancers diagnosed by open biopsy, as a percentage of non-invasive malignant diagnostic open biopsies

COMMENT:

- Due to the rising pre-operative diagnosis rate, only 1148 cancers were diagnosed by open biopsy in 2001/02. Of these, 558 (49%) were invasive, 14 (1%) micro-invasive and 569 (50%) non-invasive.
- For 43% of invasive cancers diagnosed by open biopsy there had been unsuccessful attempts to obtain a pre-operative diagnosis using core biopsy alone. For non-invasive cancers the proportion of cases where pre-operative diagnosis had been attempted with core biopsy alone was higher at 69%.
- The malignant open biopsy rate has fallen by 58% over the last 6 years from 1.82 per 1000 women screened in 1996/97 to 0.76 per 1000 in 2001/02. In 2001/02 the overall malignant open biopsy rate was 0.8 per 1000 women screened, varying from 0.6 per 1000 in Trent, South East (East) and West Midlands to 1.0 per 1000 in Northern Ireland.
- The benign open biopsy rate has remained stable since 1999/00 at around 1.3 per 1000 women screened. In 2001/02 the benign open biopsy rate was 1.3 per 1000 women screened, varying from 1.0 per 1000 in West Midlands to 1.7 per 1000 in Wales and 2.1 per 1000 in North West.
- It is of some concern that the benign open biopsy rates in North West and Wales, which were well above the rate for the UK as a whole in 2001/02, were both higher than they were in 2000/01. The regional QA reference centres and regional QA surgeons in North West and Wales should audit these cases to determine the reasons for the relatively high benign open biopsy rates recorded.
- Of the 558 invasive cancers diagnosed by open biopsy, 50 (9%) had no pre-operative procedure recorded and of the 569 non-invasive cancers diagnosed by open biopsy, 26 (5%) had no pre-operative procedure recorded. Regional QA reference centres and regional QA surgeons should audit these 76 cases to establish whether they reflect a data collection problem. If the data are found to represent clinical practice correctly, the reasons for the failure to attempt pre-operative diagnosis should be ascertained.

- Overall, 16% of invasive cancers diagnosed by open biopsy had an inadequate (C1 or B1) core biopsy or cytology sample. In the West Midlands and South East (East) this figure was 30% or more.
- Pre-operatively, in Yorkshire 57% of invasive cancers diagnosed by open biopsy had a C4 or B4 suspicion of malignancy, compared to 38% in the UK as a whole.
- In Northern Ireland and West Midlands, 47% and 24% respectively of non-invasive cancers diagnosed by open biopsy had an inadequate (C1 or B1) core biopsy or cytology sample, compared to 14% in the UK as a whole.
- In Wales and Yorkshire 48% and 47% respectively of non-invasive cancers diagnosed by open biopsy had a C4 or B4 suspicion of malignancy, compared to 37% in the UK as a whole.
- Regional QA reference centres and regional QA surgeons should audit invasive and non-invasive cases diagnosed pre-operatively as C1-C4 and B1-B4 to determine the reasons for the failure to achieve a pre-operative diagnosis.

3. SURGICAL TREATMENT

3.1 Repeat Therapeutic Operations

Quality Objective: To minimise the number of repeat operations for therapeutic purposes.

Minimum Standard: 90% of operations carried out with a proven pre-operative diagnosis of cancer (*in situ* and invasive) should not require a further operation for incomplete excision.

(Quality Assurance Guidelines for Surgeons in Breast Screening NHSBSP Publication No. 20 revised April 1996)

It is expected that the majority of screen detected breast cancers, in particular invasive cancers with a pre-operative diagnosis of B5b (Invasive) core biopsy, should undergo a single therapeutic operation. In order to examine clinical practice in this area, the audit requested the total number of therapeutic operations and details of the final operation type. This could be conservation surgery, mastectomy or an axillary procedure or both conservation surgery and an axillary procedure or both mastectomy and an axillary procedure.

Only the final operation type was requested. It was not, therefore, possible to determine whether a repeat therapeutic operation involving an axillary procedure was the first axillary procedure performed, or a repeat axillary procedure following axillary node sampling or sentinel node biopsy at the first operation. Also, regional coding differences meant that some axillary procedures may not have been counted as therapeutic operations.

Figure 11 shows that in the UK as a whole, 14% of invasive cancers and 20% of non-invasive cancers underwent more than one therapeutic operation.

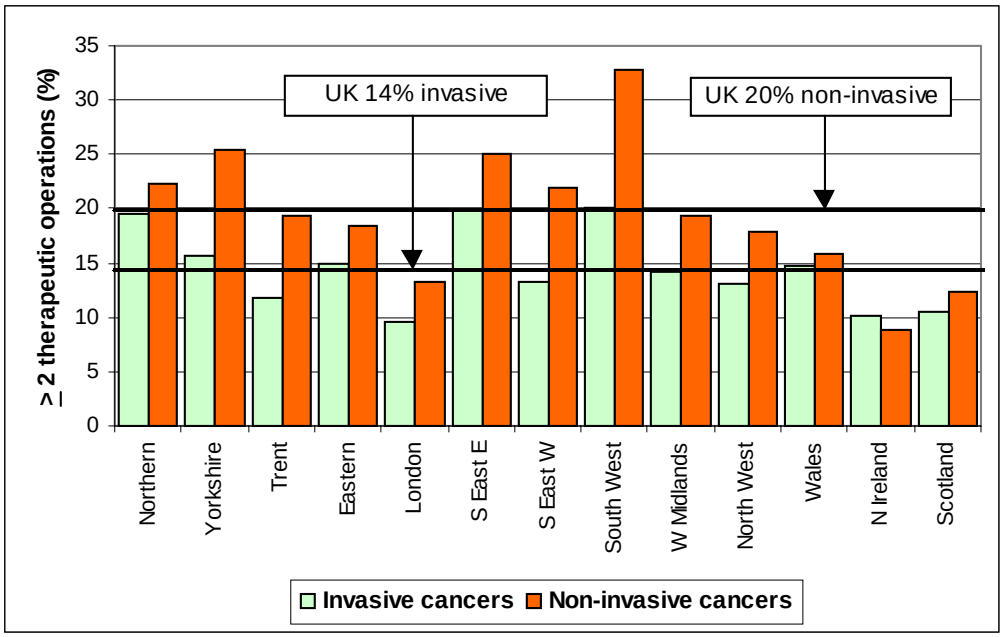

Figure 11 (Tables 18,19) : Variation in the proportion of invasive and non-invasive cancers undergoing two or more therapeutic operations

For invasive cancers the proportion having more than one operation varied from 20% in Northern, South East (East) and South West to 10% in London and Northern Ireland. For non-invasive cancers this proportion varied from 33% in South West to 9% in Northern Ireland.

In order to explore the reasons for repeat therapeutic operations for cancers with a pre-operative diagnosis, the following hypothetical scenarios were considered.

Scenario 1 :	Invasion present which was not predicted by pre-operative diagnosis and repeat operation undertaken to obtain nodes - cancers with a B5a (Non-invasive) pre-operative diagnosis found to be invasive after surgery where nodes were not taken at the first operation - cancers with a C5 diagnosis where nodes were not taken at the first operation in line with local protocol

Scenario 2 :	Margins not clear for expected component of tumour - repeat operation (conservation or mastectomy) to clear margins

Scenario 3 :	Margins not clear for unexpected DCIS present with a small invasive tumour - small cancers with a B5b (Invasive) pre-operative diagnosis found to have DCIS present after surgery require repeat operation (conservation or mastectomy) to clear margins

Scenario 4 :	Additional therapeutic nodal procedure undertaken - insufficient number of nodes harvested at first operation - therapeutic clearance of nodes when large proportion of nodes taken at first operation are positive - clearance of nodes following positive sentinel node procedure

3.1.1 Repeat Therapeutic Operations for Invasive Cancers

In order to explore the extent to which scenarios 1 and 3 could account for repeat therapeutic operations, the pre-operative history of invasive cancers undergoing 2 or more therapeutic operations was examined. Figure 12 shows the regional variation in the proportion of invasive cancers diagnosed pre-operatively by core biopsy as invasive (B5b) or non-invasive (B5a) or by cytology (C5) undergoing 2 or more repeat operations.

Of the 5287 invasive cancers with a pre-operative B5b (Invasive) core biopsy, 624 (12%) underwent a repeat therapeutic operation (Table 20). This varied from 17% in South West to 8% in Scotland. In the group of invasive cancers diagnosed pre-operatively by cytology alone, 15% underwent a repeat therapeutic operation (Table 21). This varied from 30% in South East (East) and 25% in Eastern to 7% in North West and 2% in Northern Ireland. In the group of invasive cancers with a pre-operative B5a (Non-invasive) core biopsy, 41% underwent a repeat therapeutic operation (Table 22). This varied from 62% in West Midlands to 27% in London. Details of these regional differences are summarised in Table 3.1A.

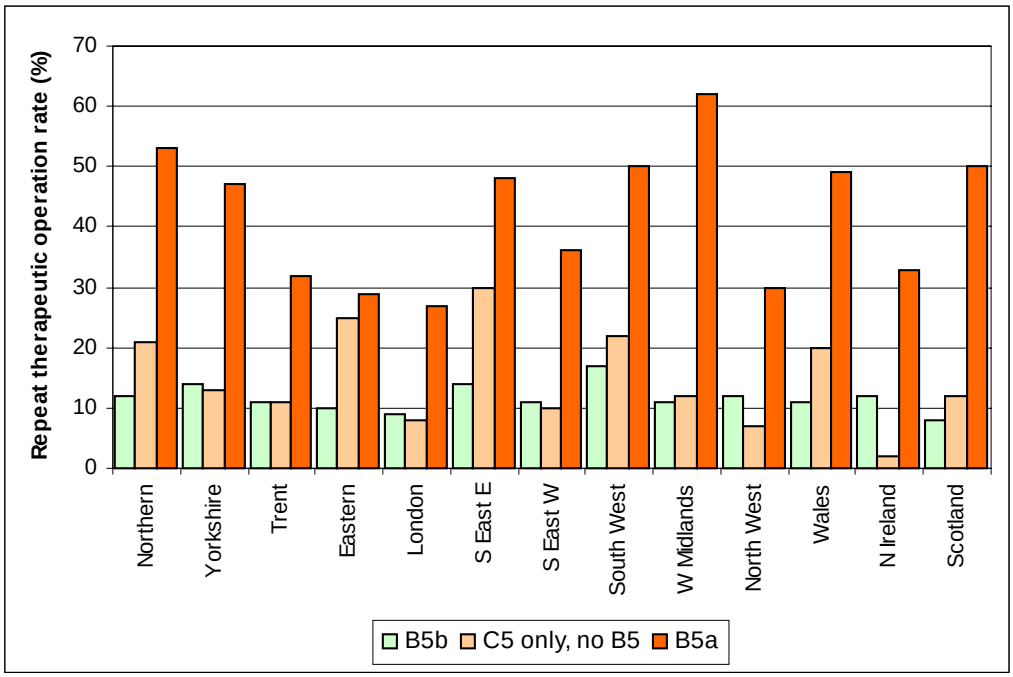

Figure 12 (Tables 20-22): Variation in the proportion of invasive cancers with a pre-operative diagnosis undergoing two or more therapeutic operations, according to pre-operative diagnosis

In Table 3.1A invasive cancers with no pre-operative diagnosis are divided into two further groups. Of the 508 invasive cancers where core biopsy or cytology was attempted but did not give a diagnosis of cancer (B1-4 and/or C1-4), 98 (19%) underwent a repeat therapeutic operation (i.e. had 3 or more operations) (Table 23). This varied from 52% in South East (East) to 0% in Trent. Of the 50 invasive cancers with no pre-operative procedure recorded, 5 (10%) underwent a repeat therapeutic operation (i.e. had 3 or more operations) (Table 24). 3 of these cases were in South East (West).

TABLE 3.1 A : REPEAT THERAPEUTIC OPERATION RATES – INVASIVE CANCERS										
Region	***B5b*** *(Table 20)*		***C5 only*** *(Table 21)*		***B5a*** *(Table 22)*		***B1-4 or C1-4 only*** *(Table 23)*		***No pre-op procedure*** *(Table 24)*	
	No.	***%***	***No.***	***%***	***No.***	***%***	***No.***	***%***	***No.***	***%***
Northern	*15/122*	*12*	*36/170*	*21*	*9/17*	*53*	*8/37*	*22*	*0/1*	*0*
Yorkshire	*57/401*	*14*	*4/31*	*13*	*15/32*	*47*	*1/20*	*5*	*0/1*	*0*
Trent	*58/521*	*11*	*8/75*	*11*	*14/44*	*32*	*0/29*	*0*	*0/1*	*0*
Eastern	*60/580*	*10*	*30/119*	*25*	*14/48*	*29*	*12/48*	*25*	*0/0*	*-*
London	*32/373*	*9*	*4/53*	*8*	*12/45*	*27*	*4/43*	*9*	*0/3*	*0*
South East (East)	*64/457*	*14*	*18/61*	*30*	*23/48*	*48*	*15/29*	*52*	*0/1*	*0*
South East (West)	*47/438*	*11*	*10/100*	*10*	*10/28*	*36*	*13/48*	*27*	*3/9*	*33*
South West	*87/523*	*17*	*23/104*	*22*	*18/36*	*50*	*12/40*	*30*	*1/6*	*17*
West Midlands	*59/516*	*11*	*9/73*	*12*	*24/39*	*62*	*4/39*	*10*	*0/1*	*0*
North West	*61/495*	*12*	*16/225*	*7*	*16/54*	*30*	*22/83*	*27*	*1/13*	*8*
Wales	*40/370*	*11*	*7/35*	*20*	*20/41*	*49*	*2/21*	*10*	*0/2*	*0*
Northern Ireland	*9/73*	*12*	*1/53*	*2*	*4/12*	*33*	*1/10*	*10*	*0/0*	*-*
Scotland	*35/418*	*8*	*17/147*	*12*	*13/26*	*50*	*4/61*	*7*	*0/12*	*0*
UK	***624/ 5287***	***12***	***183/ 1246***	***15***	***192/ 470***	***41***	***98/ 508***	***19***	***5/ 50***	***10***

Table 3.1A shows only the repeat *therapeutic* operation rates. Table 23 shows that, of the 508 cancers where core biopsy or cytology was attempted but did not give a diagnosis of cancer

(B1-4 and/or C1-4), 408 (80%) underwent 1 or more therapeutic operations following diagnostic open biopsy (i.e. had 2 or more operations). This varied from 30% in Northern Ireland to 99% in North West. Of the 50 cases in Table 24 with no pre-operative procedures recorded, 36 (72%) underwent 1 or more therapeutic operations (i.e. had 2 or more operations). Two of these 50 cancers had 3 therapeutic operations recorded following the diagnostic open biopsy.

3.1.2 Repeat Therapeutic Operations for Non-invasive and Micro-invasive Cancers

Non-invasive and micro-invasive cancers with a pre-operative diagnosis of cancer were also divided into 3 groups according to their pre-operative history. Table 3.1B summarises the regional differences between these groups. In the UK as a whole, 324 (23%) of the 1393 non-invasive and micro-invasive cancers correctly predicted by the B5a core biopsy underwent a repeat therapeutic operation (Table 25). This varied from 35% in South West to 10% in Northern Ireland. For the second group of 85 non-invasive and micro-invasive cancers diagnosed pre-operatively on the basis of cytology alone, 27% of cases underwent a repeat therapeutic operation (Table 26). This varied from 47% in Northern and 100% (1 case) in Yorkshire to 0% (0 cases) in South East (East), West Midlands and Northern Ireland. Of the 45 non-invasive and micro-invasive cancers with a pre-operative B5b (Invasive) core biopsy, 9 (20%) underwent a repeat therapeutic operation (Table 27).

In Table 3.1B the non-invasive cancers with no pre-operative diagnosis are divided into two further groups. Of the 543 non-invasive cancers where core biopsy or cytology was attempted but did not give a diagnosis of cancer (B1-4 and/or C1-4), 74 (14%) underwent 2 or more therapeutic operations following diagnostic open biopsy (Table 28). This varied from 28% in South West and 26% in South East (East) to 0% in Scotland. Of the 26 cases with no pre-operative procedures recorded, 3 (12%) underwent 2 or more therapeutic operations (Table 29).

TABLE 3.1 B : REPEAT THERAPEUTIC OPERATION RATES – NON-INVASIVE AND MICRO-INVASIVE CANCERS

	non-invasive and micro- invasive cancers						***non-invasive only***			
	B5a *(Table 25)*		***C5 only, no B5*** *(Table 26)*		***B5b*** *(Table 27)*		***B1-4 or C1-4 only*** *(Table 28)*		***No pre-op procedure*** *(Table 29)*	
Region	***No.***	***%***	***No.***	***%***	***No.***	***%***	***No.***	***%***	***No.***	***%***
Northern	*10/40*	*25*	*7/15*	*47*	*0/0*	*-*	*5/33*	*15*	*0/0*	*-*
Yorkshire	*32/106*	*30*	*1/1*	*100*	*0/3*	*0*	*7/46*	*15*	*0/1*	*0*
Trent	*35/146*	*24*	*1/3*	*33*	*1/7*	*14*	*1/37*	*3*	*0/4*	*0*
Eastern	*28/148*	*19*	*4/11*	*36*	*2/8*	*25*	*10/58*	*17*	*0/3*	*0*
London	*12/80*	*15*	*1/8*	*13*	*0/4*	*0*	*4/44*	*9*	*1/4*	*25*
South East (East)	*37/133*	*28*	*0/2*	*0*	*2/7*	*29*	*11/43*	*26*	*1/2*	*50*
South East (West)	*29/101*	*29*	*1/4*	*25*	*1/3*	*33*	*4/54*	*7*	*1/2*	*50*
South West	*51/147*	*35*	*1/4*	*25*	*2/4*	*50*	*13/47*	*28*	*0/2*	*0*
West Midlands	*29/117*	*25*	*0/5*	*0*	*0/1*	*0*	*2/42*	*5*	*0/0*	*-*
North West	*28/158*	*18*	*1/6*	*17*	*1/3*	*33*	*12/60*	*20*	*0/2*	*0*
Wales	*14/88*	*16*	*1/5*	*20*	*0/3*	*0*	*3/23*	*13*	*0/0*	*-*
Northern Ireland	*2/21*	*10*	*0/6*	*0*	*0/0*	*-*	*2/18*	*11*	*0/1*	*0*
Scotland	*17/108*	*16*	*5/15*	*33*	*0/2*	*0*	*0/38*	*0*	*0/5*	*0*
United Kingdom	***324/ 1393***	***23***	***23/ 85***	***27***	***9/ 45***	***20***	***74/ 543***	***14***	***3/ 26***	***12***

As in Table 3.1A, Table 3.1B shows only the repeat *therapeutic* operation rates. Table 28 shows that of the 543 non-invasive cancers where core biopsy or cytology was attempted but did not give a diagnosis of cancer (B1-4 and/or C1-4), 333 (61%) underwent 1 or more therapeutic operations following diagnostic open biopsy (i.e. had 2 or more operations). This varied from 92% in North West to 24% in Scotland. Of the 26 cases with no pre-operative procedures recorded, 12 (46%) underwent 1 or more therapeutic operations (i.e. had 2 or more operations) (Table 29).

3.1.3 Final Operation Type and Pre-operative History

Figure 13 shows the final operation type of the 624 invasive cancers with a pre-operative diagnosis of B5b (Invasive) core biopsy that underwent two or more therapeutic operations.

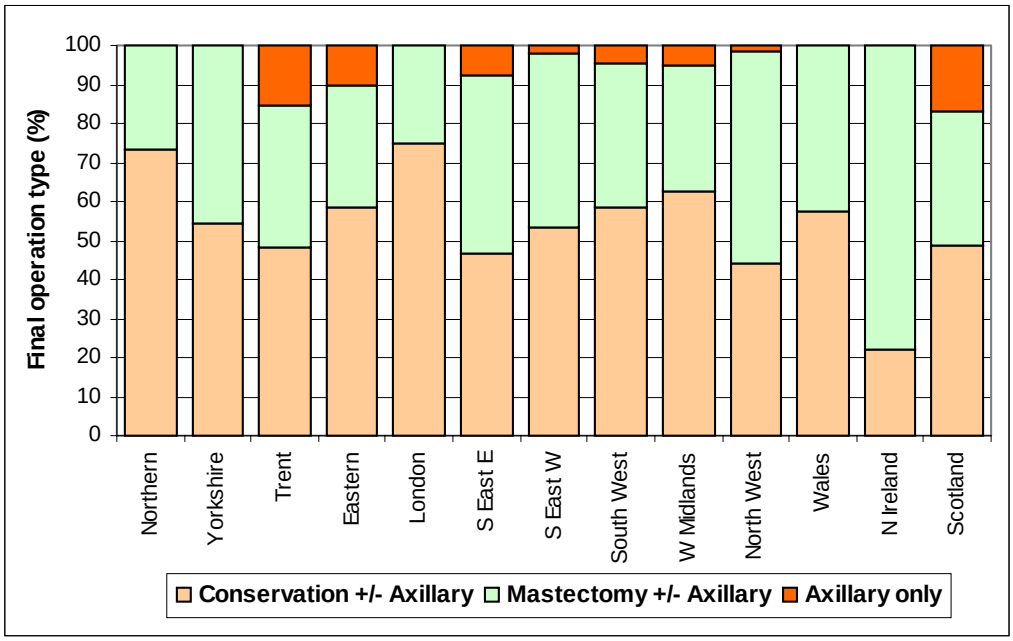

Figure 13 (Table 30): Variation in the final operation type of invasive cancers with a pre-operative diagnosis of B5b (Invasive) undergoing two or more therapeutic operations

In the UK as a whole, 341 (55%) of the repeat operations included conservation surgery and 248 (40%) included mastectomy. The remaining 35 (6%) underwent a repeat operation only to obtain axillary nodes. In Northern (73%), Yorkshire (54%), Eastern (58%), London (75%), South East (West) (53%), South West (59%), West Midlands (63%) and Wales (58%) the majority of repeat operations were re-excisions that continued to conserve the breast. In North West (54%) and Northern Ireland (78%) the majority of repeat operations were mastectomies.

Figure 14 shows the final operation type of the 324 non-invasive and micro-invasive cancers with a pre-operative diagnosis of B5a (Non-invasive) core biopsy that underwent two or more therapeutic operations. The proportion of repeat procedures which involved conservation surgery varied from 44% in Yorkshire to 71% in Eastern and North West.

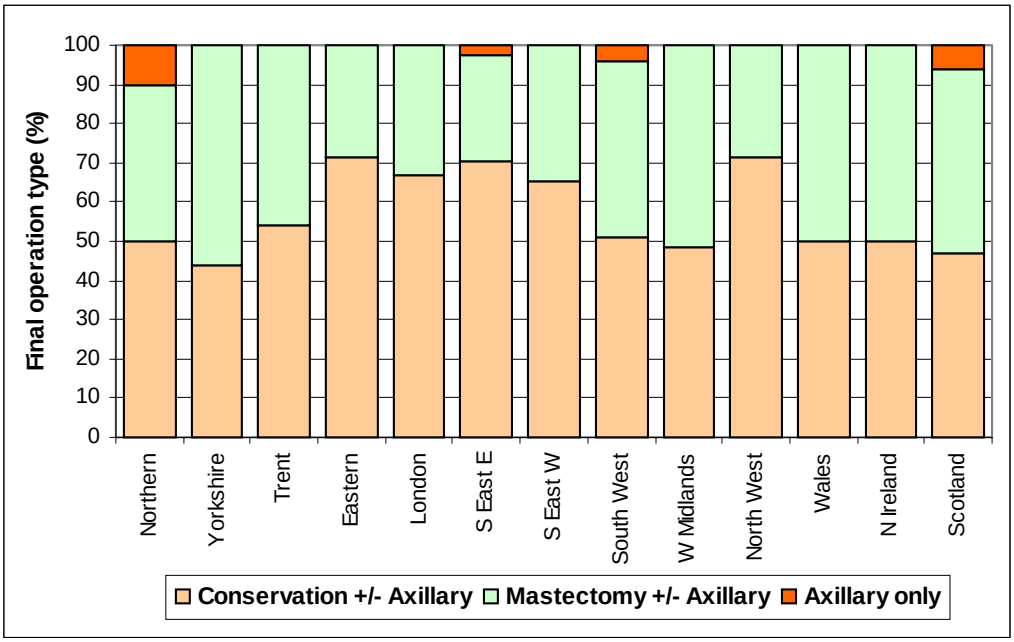

Figure 14 (Table 35): Variation in the final operation type of non-invasive or micro-invasive cancers with a pre-operative diagnosis of B5a (Non-invasive) undergoing two or more therapeutic operations

The final operation types of the non-invasive and micro-invasive cancers pre-operative diagnosis other than B5a, and of the non-invasive cancers with no pre-operative diagnosis, are detailed in Tables 36 to 38 and (for those with no pre-operative diagnosis recorded) Table 34.

3.1.4 Final Operation Type, Nodal Status and Pre-operative History

Figure 15, and the summary table 3.1C below, show that in the UK as a whole 250 (5%) of the 5287 B5b (Invasive) cancers underwent a repeat operation involving axillary nodes. This varied from 1% in Northern Ireland (1 case) to 7% in Eastern (40 cases) and South East (West) (32 cases) and 9% in South West (48 cases).

TABLE 3.1C PROPORTION OF INVASIVE CANCERS UNDERGOING A REPEAT OPERATION TO OBTAIN AXILLARY NODES

Region	***B5b*** *(Tables 20,30)*		***C5 only*** *(Tables 21,31)*		***B5a*** *(Tables 22,32)*	
	No.	***%***	***No.***	***%***	***No.***	***%***
Northern	3/122	2	13/170	8	5/17	29
Yorkshire	15/401	4	1/31	3	11/32	34
Trent	9/521	2	0/75	0	13/44	30
Eastern	40/580	7	26/119	22	13/48	27
London	23/373	6	2/53	4	11/45	24
South East (East)	12/457	3	7/61	11	18/48	38
South East (West)	32/438	7	6/100	6	8/28	29
South West	48/523	9	13/104	13	13/36	36
West Midlands	24/516	5	5/73	7	21/39	54
North West	29/495	6	4/225	2	13/54	24
Wales	6/370	2	2/35	6	19/41	46
Northern Ireland	1/73	1	0/53	0	4/12	33
Scotland	8/418	2	8/147	5	12/26	46
UK	**250/ 5287**	**5**	**87/ 1246**	**7**	**161/ 470**	**34**

Figure 15 and Table3.1C also show that, of the 1246 invasive cancers in the UK diagnosed pre-operatively on the basis of cytology alone, 87 (7%) underwent a repeat operation for axillary nodes. This varied from 0% in Trent and Northern Ireland (0 cases) to 13% in South West (13 cases) and 22% in Eastern (26 cases). Finally, of the 470 invasive cancers in the UK as a whole with a B5a (Non-invasive) core biopsy, 161 (34%) underwent a repeat operation for axillary nodes. This varied from 24% in London (11 cases) and North West (13 cases) to 54% in West Midlands (21 cases).

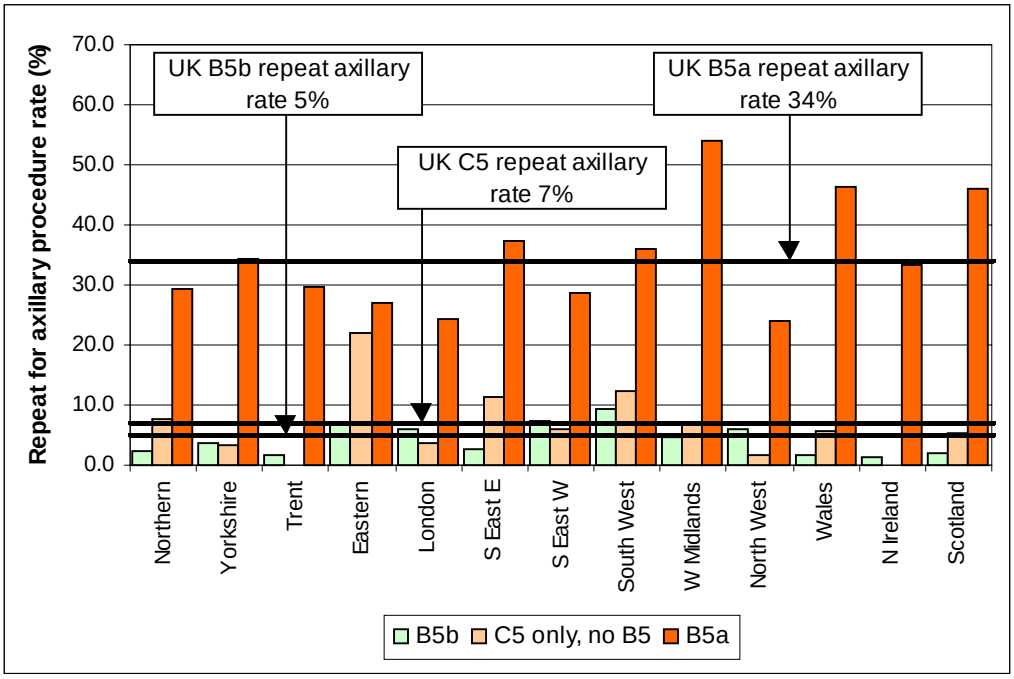

Figure 15 (Tables 20-22, 30-32): Variation in the proportion of invasive cancers with a pre-operative diagnosis undergoing a repeat operation to obtain axillary nodes, according to pre-operative diagnosis

In the UK as a whole, of the 250 invasive cancers with a B5b (Invasive) core biopsy that underwent a repeat operation involving axillary nodes, 35 underwent a repeat operation only to perform an axillary procedure (Tables 20 and 30). 9 of these were in Trent, and 6 in Scotland. In these regions, an axillary node procedure alone accounted for more than 15% of the B5b (Invasive) cancers which had 2 or more therapeutic operations. A further 126 invasive cancers with a B5b (Invasive) core biopsy underwent a subsequent operation which combined conservation surgery with an axillary procedure and 89 underwent a subsequent operation combining mastectomy with an axillary procedure. In London conservation surgery with an axillary node procedure accounted for 59% of B5b (Invasive) cancers which had 2 or more therapeutic operations. In Eastern (25%), South East (West) (30%), South West (24%) and North West (21%) mastectomy with an axillary node procedure accounted for 20% or more of B5b (Invasive) cancers which had 2 or more therapeutic operations.

The final operation types of the invasive cancers with diagnosed pre-operatively as B1-B4 and C1-C4 that underwent 2 or more therapeutic operations are provided in Table 33. Table 34 provides equivalent data for invasive cancers where no pre-operative procedure was recorded.

Table 3.1D shows that in the UK as a whole, 97% of invasive cancers with a B5b (Invasive) or C5 pre-operative diagnosis had known nodal status. These proportions were lowest in London (92% and 91% respectively) and highest in Yorkshire (100%). In the UK as a whole, only 84% of invasive cancers with a B5a (Non-invasive) pre-operative diagnosis had known nodal status. This varied from 97% in West Midlands to 71% in London and 70% in North West. The proportion of cancers diagnosed pre-operatively as B1-4 or C1-4 with known nodal status was also low at 81% for the UK as a whole. The lowest values were again evident in London (65%) and the North West (67%). There were also 43 cancers which had no pre-operative procedure recorded that had unknown nodal status. 11 of these were in North West and 11 in Scotland.

TABLE 3.1 D : PROPORTION OF INVASIVE CANCERS WITH KNOWN NODAL STATUS, ACCORDING TO PRE-OPERATIVE DIAGNOSIS

Region	B5b		C5 only		B5a		B1-4 or C1-4 only		No pre-op procedure	
	No.	%	No.	%	No.	%	No.	%	No.	%
Northern	119/122	98	169/170	99	15/17	88	34/37	92	1/1	100
Yorkshire	400/401	100	31/31	100	29/32	91	18/20	90	1/1	100
Trent	518/521	99	73/75	97	40/44	91	29/29	100	1/1	100
Eastern	559/580	96	104/119	87	36/48	75	34/48	71	0/0	-
London	345/373	92	48/53	91	32/45	71	28/43	65	3/3	100
South East (East)	447/457	98	61/61	100	42/48	88	26/29	90	1/1	100
South East (West)	424/438	97	94/100	94	21/28	75	35/48	73	7/9	78
South West	495/523	95	101/104	97	30/36	83	34/40	85	4/6	67
West Midlands	508/516	98	73/73	100	38/39	97	34/39	87	1/1	100
North West	471/495	95	218/225	97	38/54	70	56/83	67	11/13	85
Wales	367/370	99	35/35	100	39/41	95	21/21	100	2/2	100
Northern Ireland	70/73	96	52/53	98	10/12	83	3/10	30	0/0	-
Scotland	417/418	100	145/147	99	25/26	96	59/61	97	11/12	92
UK	**5140/ 5287**	**97**	**1204/ 1246**	**97**	**395/ 470**	**84**	**411/ 508**	**81**	**43/ 50**	**86**

TABLE 3.1 E : PROPORTION OF INVASIVE CANCERS WITH KNOWN NODAL STATUS, DETERMINED BY REPEAT OPERATIONS INVOLVING THE AXILLA ACCORDING TO PRE-OPERATIVE DIAGNOSIS

Region	B5b (Table 30)		C5 only (Table 31)		B5a (Table 32)	
	No.	%	No.	%	No.	%
Northern	*2/119	1.7	13/169	7.7	5/15	33.3
Yorkshire	15/400	3.8	1/31	3.2	11/29	37.9
Trent	9/518	1.7	0/73	0.0	13/40	32.5
Eastern	40/559	7.2	26/104	25	13/36	36.1
London	23/345	6.7	2/48	4.2	*10/32	31.3
South East (East)	12/447	2.7	7/61	11.5	18/42	42.9
South East (West)	32/424	7.5	6/94	6.4	8/21	38.1
South West	48/495	9.7	*12/101	11.9	13/30	43.3
West Midlands	24/508	4.7	5/73	6.8	21/38	55.3
North West	29/471	6.2	4/218	1.8	13/38	34.2
Wales	6/367	1.6	2/35	5.7	19/39	48.7
Northern Ireland	1/70	1.4	0/52	0.0	*3/10	30.0
Scotland	8/417	1.9	8/145	5.5	12/25	48.0
UK	**249/ 5140**	**4.9**	**86/ 1204**	**7.1**	**159/ 395**	**40.3**

*Only 2/3, 12/13, 10/11 and 3/4 axillary procedures resulted in a known nodal status

From the data in Tables 3.1D and 3.1E the proportion of invasive cancers undergoing repeat procedures to obtain axillary nodes can be compared with the proportion of invasive cancers with known nodal status. In the group of invasive cancers with B5b (Invasive) pre-operative diagnosis, of which 97% had nodal status known, of the nodes with known nodal status, 4.9% had their status determined as a result of axillary procedures undertaken as repeat operations. This proportion was highest in South West (9.7%) and this is consistent with the relatively high overall repeat therapeutic operation rate recorded for this region in Table 3.1A. The majority of these repeat operations involved conservation surgery or mastectomy as well as an axillary nodal procedure (Figure 13).

For invasive cancers in the group diagnosed pre-operatively by cytology alone of which 97% had nodal status known, 7.1% of the cancers with known nodal status had their status determined as a result of axillary procedures undertaken as repeat operations. This proportion was highest in South East (East) (11.5%), South West (11.9%) and Eastern (25%). In Eastern, without these additional axillary procedures, the proportion of cancers in this group with known nodal status would have been 66% rather than 87%. It would thus appear that in Eastern there is a reluctance to carry out an axillary nodal procedure at the first operation for cancers diagnosed pre-operatively by cytology alone, and that repeat operations are subsequently undertaken for a high proportion of invasive C5 cancers in order to determine the nodal status. This policy may reflect the fact that in this region only 91% of cancers with a C5 diagnosis were found to be invasive after surgery (Table 9) and it would be interesting to look at individual screening unit data to see if this explanation is correct.

In South West without these additional therapeutic operations, the proportion of cancers with known nodal status in this group would have been 85% rather than 97%. In South East (East) the proportion would have been 89% rather than 100%. South West and South East (East) therefore appear to achieve their very high pre-operative diagnosis rates for C5 by carrying out a repeat procedure on a proportion of women from whom they did not take nodes at the first operation. It would be interesting to look at the radiological and clinical information available for these women that informed the initial decision not to take nodes, since in these regions 95-96% of cancers with a C5 pre-operative diagnosis were found to be invasive after surgery (Table 9).

Only 84% of invasive cancers with B5a (Non-invasive) diagnosis at core biopsy had nodal status known, and of the cancers with known nodal status, 40% had their status determined as a result of axillary procedures undertaken as repeat operations. This proportion was highest in West Midlands (55%), Wales (49%) and Scotland (48%). In all of these regions the proportion of B5a cancers with known nodal status was over 95%. In London and North West, where the proportion of B5a cancers with nodal status was between 70% and 71%, repeat operation rates were lower than in other regions (27% and 30% respectively compared with 41% in the UK as a whole). It would therefore appear that there is an unwillingness in these regions to carry out a repeat operation to determine the nodal status and that as a result, a proportion of women may have been under diagnosed. It would be interesting to examine the sizes of the tumours without nodal status to see if this is a factor influencing these management decisions.

COMMENT:

- In the UK as a whole, 1143 (14%) invasive cancers and 424 (20%) non-invasive cancers underwent more than one therapeutic operation. For invasive cancers the proportion having more than one operation varied from 20% in Northern, South East (East) and South West to 10% in London and Northern Ireland. For non-invasive cancers this proportion varied from 33% in South West to 9% in Northern Ireland.
- 624 (12%) invasive cancers with a B5b (Invasive) pre-operative core biopsy sample underwent a repeat therapeutic operation. In South West this was 17%. 183 (15%) invasive cancers with a pre-operative diagnosis by fine needle cytology alone underwent a repeat therapeutic operation. In South East (East) this was 30%. 192 (41%) invasive cancers with a B5a (Non-invasive) pre-operative core biopsy underwent a repeat therapeutic operation. In West Midlands this was 62%.
- 80% of the 508 invasive cancers where core biopsy or cytology did not give a diagnosis of cancer underwent 1 or more therapeutic operations following diagnostic open biopsy. 19% underwent 2 or more therapeutic operations following diagnostic open biopsy.
- 72% of the 50 invasive cancers with no pre-operative procedures recorded underwent 1 or more therapeutic operations following diagnostic open biopsy.
- 23% (324 cases) of non-invasive and micro-invasive cancers correctly predicted by a B5a (Non-invasive) core biopsy underwent a repeat therapeutic operation, compared to 27% (23) of cases with a pre-operative diagnosis by fine needle cytology only and 20% (9) of cases where a B5b (Invasive) core biopsy predicted invasive disease.
- In the UK as a whole, 55% of the 624 invasive cancers with a pre-operative diagnosis of invasive disease at core biopsy that underwent two or more therapeutic operations had repeat operations that included conservation surgery. 40% (248 cases) included mastectomy and the remaining 6% (35 cases) underwent a repeat operation only to obtain axillary nodes. There was wide regional variation in the reasons for repeat operations.
- In the UK as a whole, 250 (5%) invasive cancers with a B5b (Invasive) pre-operative diagnosis underwent a repeat operation involving axillary nodes. For invasive cancers diagnosed pre-operatively on the basis of cytology alone (87) this proportion was 7% and for those diagnosed pre-operatively as B5a (Non-invasive) cancers (161) it was 34%.
- In Trent and Scotland, an axillary nodes procedure alone accounted for more than 15% of the B5b (Invasive) cancers which had 2 or more therapeutic operations.
- Overall, 97% of invasive cancers with a B5b (Invasive) or C5 pre-operative diagnosis had known nodal status while only 84% of cancers with a B5a (Non-invasive) pre-operative diagnosis had known nodal status. These proportions were lowest in London (92%,91% and 71% respectively).
- Overall, 7.1% of invasive cancers with a C5 pre-operative diagnosis had their nodal status determined as a result of axillary procedures undertaken as repeat operations. This proportion was highest in South East (East) (11.5%), South West (11.9%) and Eastern (25%).
- In Eastern, without these additional axillary procedures, the proportion of cancers in this group with known nodal status would have been 66% rather than 87%. It would thus appear that in Eastern there is a reluctance to carry out an axillary nodal procedure at the first operation for cancers diagnosed pre-operatively by cytology alone, and that repeat operations are subsequently undertaken for a high proportion of invasive C5 cancers in order to determine the nodal status. This policy may reflect the fact that in this region only 91% of cancers with a C5 diagnosis were found to be invasive after surgery and it would be interesting to look at individual screening unit data to see if this explanation is correct.

- South West and South East (East) appear to achieve their very high pre-operative diagnosis rates for C5 by carrying out a repeat procedure on a proportion of women from whom they did not take nodes at the first operation. It would be interesting to look at the radiological and clinical information available for these women that informed the initial decision not to take nodes since in these regions 95-96% of cancers with a C5 pre-operative diagnosis are found to be invasive after surgery.
- Only 84% of invasive cancers with B5a (Non-invasive) diagnosis at core biopsy had nodal status known, and of the cancers with known nodal status, 40% had their status determined as a result of axillary procedures undertaken as repeat operations. This proportion was highest in West Midlands (55%), Wales (49%) and Scotland (48%). In all of these regions the proportion of B5a cancers with known nodal status was over 95%.
- In London and North West, where the proportion of B5a cancers with nodal status was between 70% and 71%, repeat operation rates were lower than in other regions (27% and 30% respectively. It would therefore appear that there is an unwillingness in these regions to carry out a repeat operation to determine the nodal status and that as a result, a proportion of women may have been under diagnosed. It would be interesting to examine the sizes of the tumours without nodal status to see if this was a factor influencing these management decisions.

3.2 Treatment for Non-invasive and Micro-invasive Breast Cancer

The variation in treatment type for non-invasive and micro-invasive breast cancers is shown by region in Figure 16 and by individual screening unit in Figure 17. Overall 69% of non-invasive and micro-invasive cancers were treated with conservation surgery, varying from 59% in Trent to 83% in Northern Ireland.

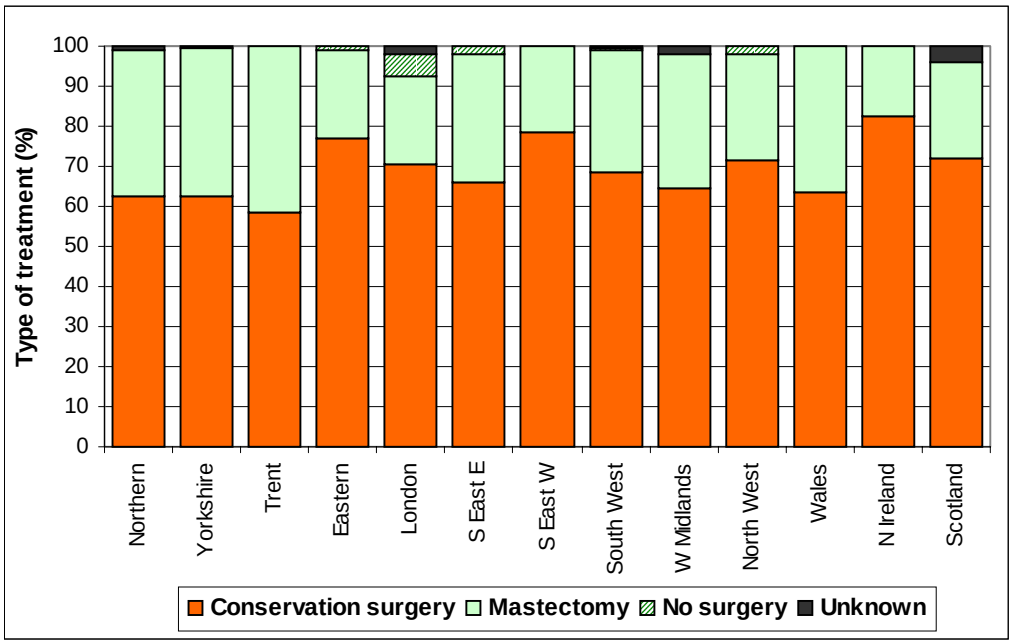

Figure 16 (Table 39) : Variation in treatment for non-invasive and micro-invasive cancers

Conservation surgery rates in individual screening units varied between 13% and 100%. The 3 units with the lowest conservation surgery rates treated 8, 3 and 9 non-invasive cancers. Regional QA reference centres and regional QA surgeons should audit these cases to ascertain the reasons for these very low rates of conservation surgery.

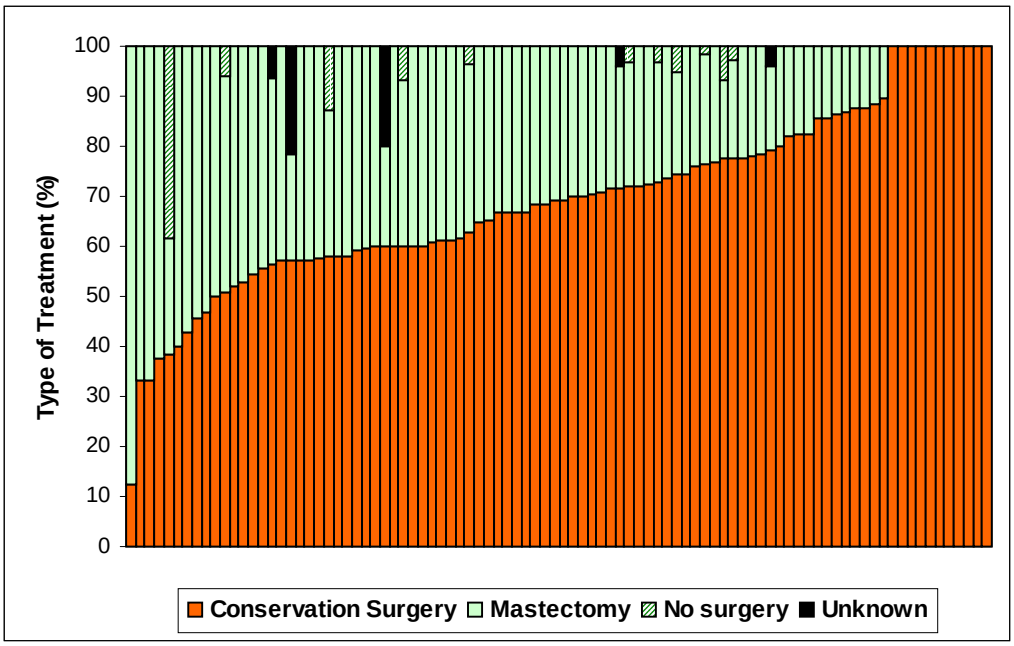

Figure 17 : Variation by screening unit in treatment for non-invasive and micro-invasive cancers

The data completeness of nuclear grade, disease extent and pathological size recorded for the 2109 non-invasive cancers detected by the UK NHSBSP in 2001/02 is shown in Table 43. Overall, 55% of non-invasive cancers had complete non-invasive data. This varied from 99% in Trent and 88% in West Midlands to 38% in London and 33% in Scotland. In Scotland, 61% of non-invasive cancers had unknown nuclear grade compared with 11% in the UK as a whole. In Eastern this figure was 28%. 24% of non-invasive cancers in North West and 18% in Eastern had disease extent and size unknown compared to 9% in the UK as a whole. North West (29%), London (21%) and Eastern (20%) had the highest proportion of cases with size unknown

Four year trend data presented in the table below show that the collection of grade, disease extent and size had been improving over the previous years but worsened in 2001/02. However, Northern, Trent, London, South East (East), South East (West), West Midlands and Northern Ireland maintained or improved non-invasive data completeness in 2001/02 compared to 2000/01.

4 YEAR COMPARISON: DATA COMPLETENESS FOR NON-INVASIVE CANCERS			
Year of data collection	*Unknown nuclear grade*	*Unknown disease extent*	*Unknown size*
	%	*%*	*%*
1998/99	*17*	*50*	*-*
1999/00	*6*	*37*	*16*
2000/01	*7*	*33*	*12*
2001/02	*11*	*40*	*13*

Data from Scotland are absent in 1998/99 Disease extent was termed “focal status” in 1998/99

In the UK as a whole, 1017 (48%) of non-invasive cancers were high grade, 834 (40%) other grade and for 36 (2%) grade was not assessable. 222 non-invasive cancers (11%) had unknown nuclear grade (Table 40). The variation in the nuclear grade of non-invasive cancers in each screening unit is shown in Figure 18. 63 screening services supplied grade for 100% of cases. 53% of non-invasive cancers in these 63 units were high grade.

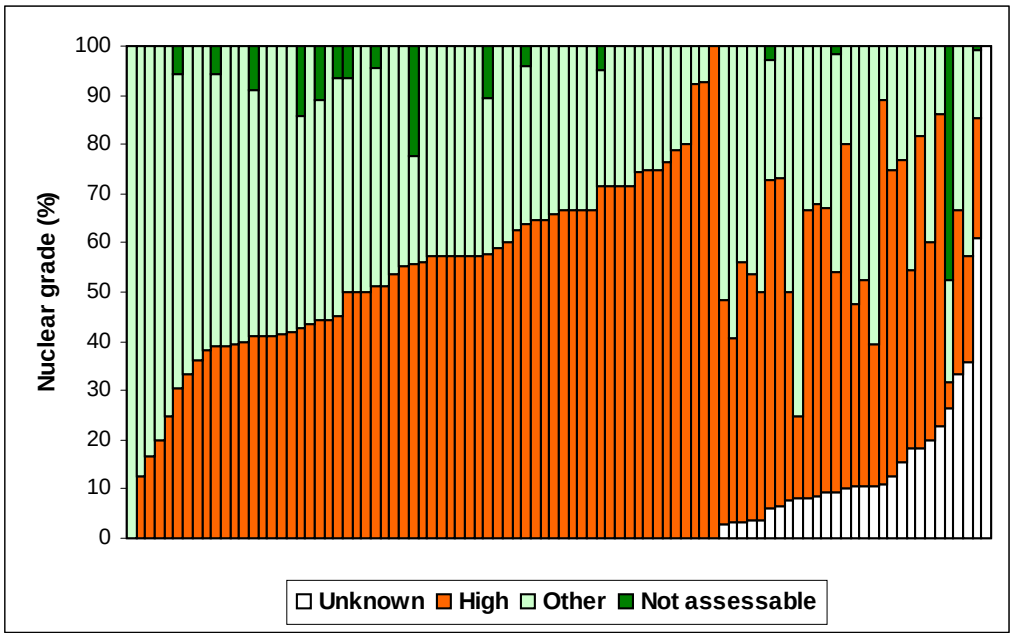

Figure 18 : Variation by unit in the nuclear grade of non-invasive cancers

The regional variation in the disease extent of non-invasive cancers is provided in Table 41. Figure 19 shows the variation in disease extent in each screening unit. Only 24 screening units, with between 1 and 47 non-invasive cancers, were able to supply disease extent for all cases.

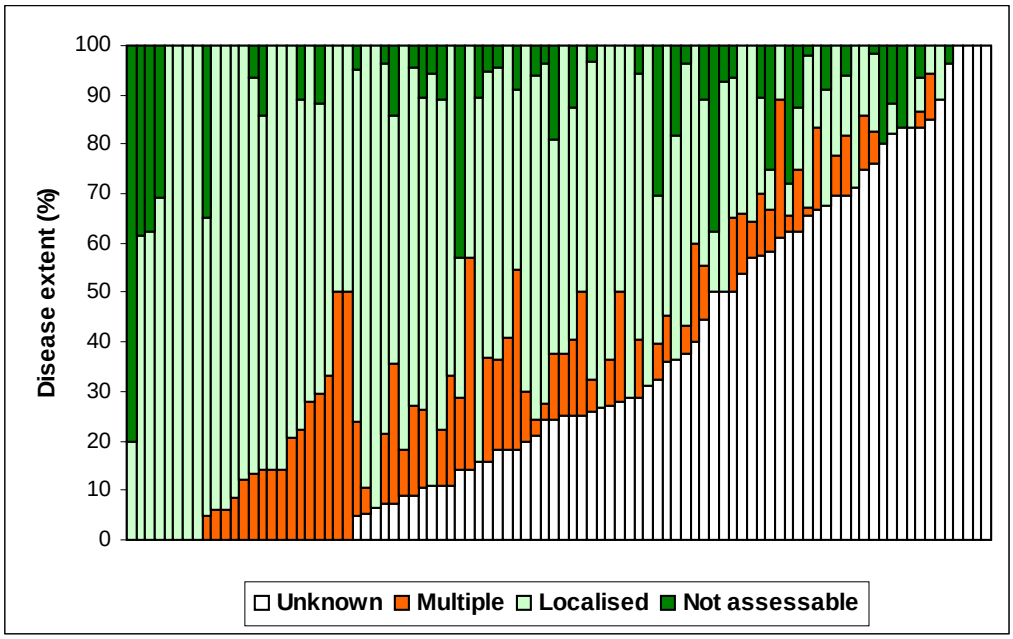

Figure 19 : Variation by unit in the disease extent of non-invasive cancers

The regional variation in the size of non-invasive cancers is provided in Table 42. Figure 20 shows the variation in size in each screening unit. 34 screening services supplied size for all non-invasive cancers.

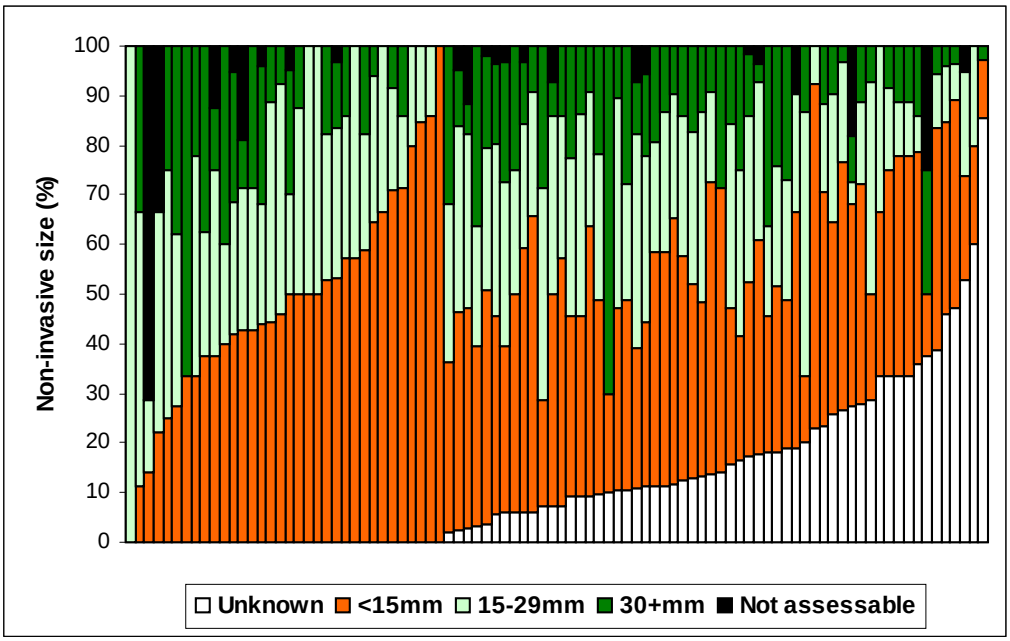

Figure 20 : Variation by unit in the size of non-invasive cancers

Of the 102 non-invasive cancers recorded as high grade multi-focal, 28 cases (27%) were treated by conservation surgery and 74 (73%) by mastectomy (Table 44). In South West 9 high grade multi-focal cases (50%) were treated by conservation surgery. Tables 45 and 46 show the treatment of other non-invasive cancers which could potentially be high grade multi-focal tumours. In Eastern, 25 non-invasive cancers with neither grade nor disease extent nor size recorded were treated with conservation surgery. Of the 75 multi-focal non-invasive cancers with size 30mm or more, 19 (25%) were treated by conservation surgery. 9 of these cases were from the South West region (Table 47).

These data are summarised in the following table which shows the number of non-invasive cancers treated by conservation surgery that are either high grade and multi-focal, potentially high grade and multi-focal or large (30+mm) multi-focal non-invasive cancers. Of the 123 cancers, 29 (24%) were in Eastern, 24 (20%) in South West and 21 (17%) in North West.

NUMBER OF NON-INVASIVE CANCERS IN EACH REGION TREATED WITH CONSERVATION SURGERY					
	High grade multi-focal *(Table 44)*	***Unknown disease extent, unknown or not applicable size***		***Multi-focal 30+mm*** *(Table 47)*	***Total number****
Region		***High grade*** *(Table 45)*	***Unknown grade*** *(Table 46)*		
Northern	1	0	0	0	1
Yorkshire	3	1	0	3	5
Trent	1	0	0	0	1
Eastern	1	1	25	2	29
London	3	7	6	3	18
South East (East)	2	0	6	1	8
South East (West)	2	1	1	0	4
South West	9	5	3	9	24
West Midlands	2	0	2	0	4
North West	3	10	8	0	21
Wales	0	0	0	0	0
Northern Ireland	1	1	0	1	3
Scotland	0	0	5	0	5
UK	**28**	**26**	**56**	***19***	**123**

*counts each high grade multi-focal 30+mm non-invasive cancer once only

The variation in treatment for non-invasive cancers will be examined in more detail as part of the Sloane Project, launched at the ABS at BASO meeting in April 2003. Treatment data will be combined with pathology and radiology data for all cases of non-invasive breast cancer detected by the UK NHSBSP.

COMMENT:

- Overall data completeness for non-invasive cancers worsened in 2001/02 but Northern, Trent, London, South East (East), South East (West), West Midlands and Northern Ireland maintained or improved non-invasive data completeness compared to 2000/01.
- 28 high grade multi-focal non-invasive cancers and 19 large multi-focal were treated with conservation surgery.
- A further 82 potentially high grade multi-focal cancers which were treated with conservation surgery may have been undertreated because of a lack of diagnostic data relating to disease extent and/or tumour grade. Regional QA reference centres and regional QA surgeons should audit these cases to ascertain the reasons for lack of relevant diagnostic information.
- The variation in treatment for non-invasive cancers will be examined in more detail as part of the Sloane Project, launched at the ABS at BASO meeting in April 2003.

3.3 Treatment for Invasive Breast Cancer

Of the 7911 invasive breast cancers detected by the UK NHSBSP in 2001/02, 5575 (70%) underwent conservation surgery, 2241 (28%) had a mastectomy and 59 cases (1%) had no surgery. Treatment information was unavailable for 36 cases, of which 25 (69%) were in Scotland. Figure 21 shows the regional variation in invasive cancer mastectomy rates from 18% in London to 34% in Yorkshire and Trent.

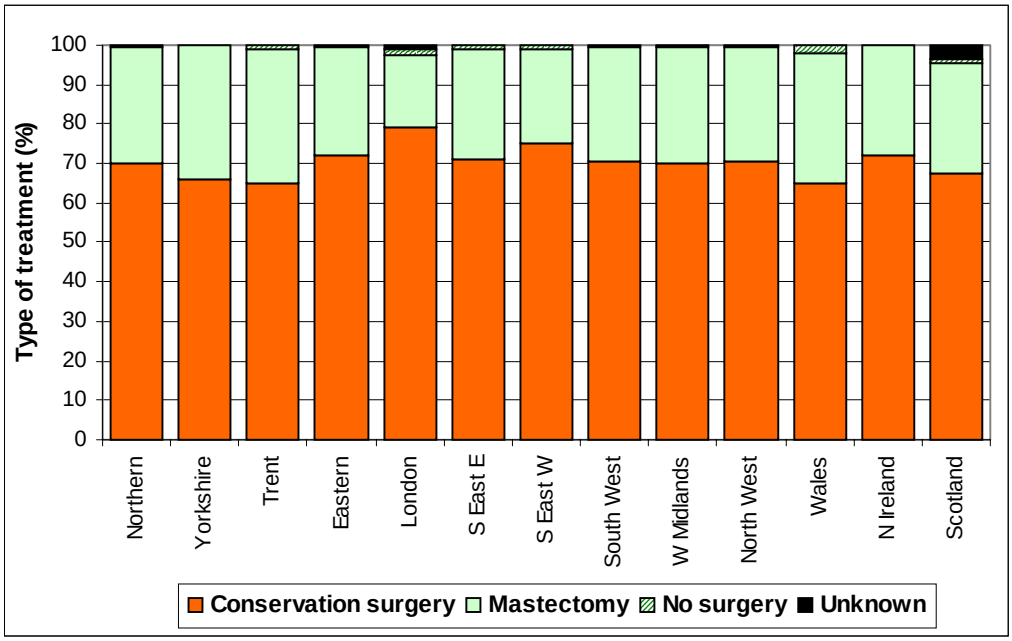

Figure 21 (Table 48) : Variation in the type of treatment for invasive cancers (all sizes)

Variation by individual screening unit is shown in Figure 22. Conservation surgery rates for individual screening units varied between 40% and 93%. The 2 units with the lowest

conservation surgery rates treated 30 and 42 invasive cancers and the unit with the highest conservation surgery rate treated 14 invasive cancers.

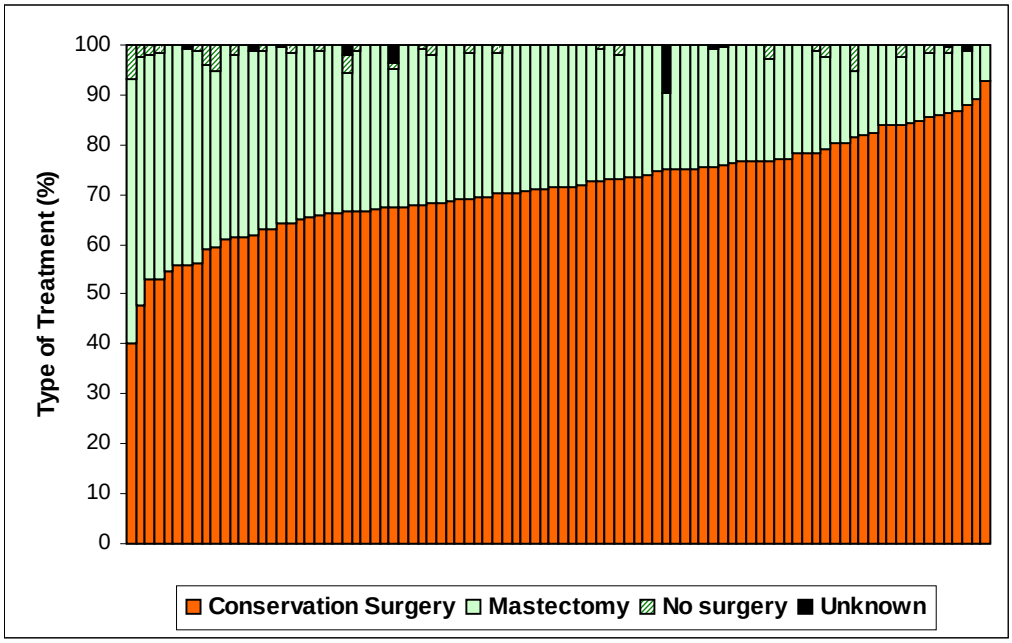

Figure 22 : Variation in the type of treatment for invasive cancers (all sizes)

3.3.1 Treatment According to Invasive Size

Table 49 gives the invasive size of the 7911 invasive breast cancers. Overall 1957 cases (25%) measured less than 10mm, 2276 (29%) were 10-14mm in diameter, 1582 (20%) were 15-19mm in diameter and 1837 (23%) were 20-49mm. 133 cases (2%) were 50mm or more. Size was unavailable for 126 cases (2%). In London 41 (6%) of the 677 invasive cancers had no size recorded.

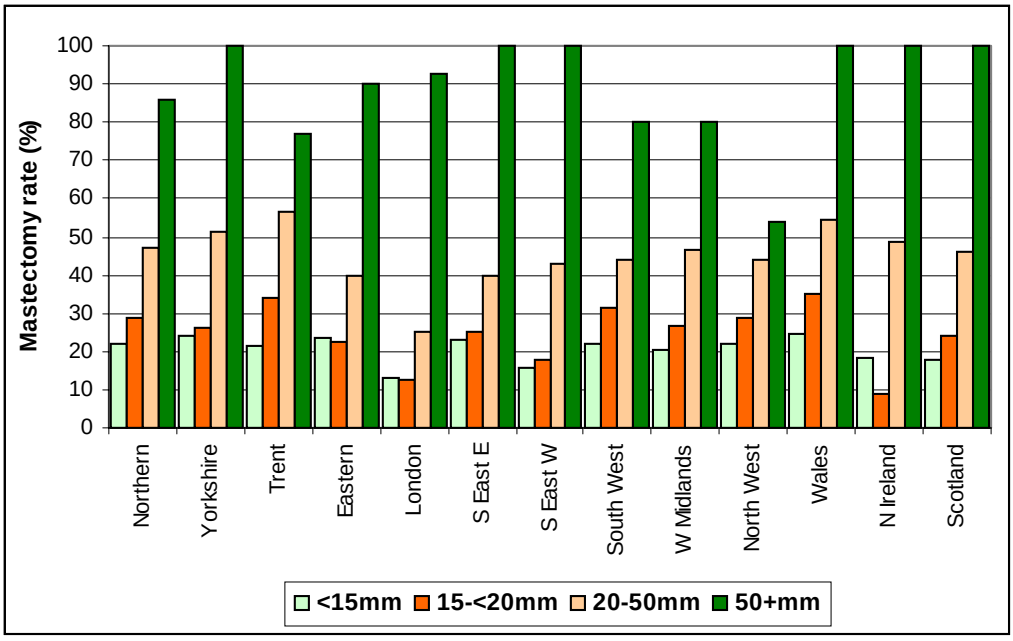

Figure 23 (Tables 52-55) : Variation in mastectomy rates with invasive tumour size

Figure 23 shows the regional variation in mastectomy rates for invasive breast cancer with invasive tumour size. In the UK as a whole the mastectomy rate increased according to the

invasive tumour size, with 84% of 50+mm tumours being treated with mastectomy compared with 21% of small (<15mm) invasive tumours. In Eastern and Northern Ireland the mastectomy rate for 15-19mm tumours was slightly lower than that for small (<15mm) invasive tumours. The mastectomy rate for large (50+mm) invasive cancers was only 54% in North West and 77% in Trent compared to 84% in the UK as a whole.

The variation by screening unit in the mastectomy rates for <15mm invasive tumours, from 4% to 44% is shown in Figure 24. For 14 screening units, with between 10 and 76 small (<15mm) invasive cancers, the mastectomy rate was 10% or less. For 12 screening units, with between 16 and 74 small (<15mm) invasive cancers, the mastectomy rate was more than 30%.

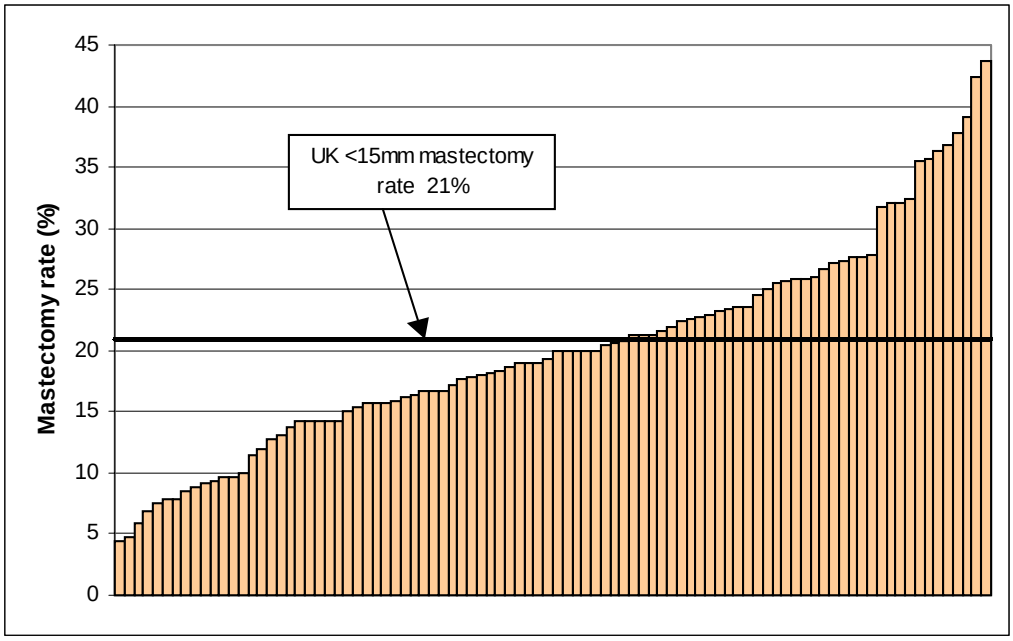

Figure 24 (Table 52) : Variation by unit in mastectomy rates for <15mm invasive tumours

3.3.2 Treatment of Invasive Cancers with Invasive Component <15mm in Diameter

The following summary table shows that, for the UK as a whole, the mastectomy rate for small (<15mm) invasive tumours rose slightly to 21% in 2001/02. It would be interesting to investigate whether this slight increase is significant and whether it was due to varying clinical practice or simply the variation in size distribution across the years. The highest mastectomy rates for small (<15mm) invasive cancers were seen in Wales (25%) and Yorkshire (24%) and the lowest in London (13%) (Table 52).

6 YEAR COMPARISON: TREATMENT FOR SMALL INVASIVE CANCERS (<15mm)					
Year of data collection	*Total invasive cases <15mm*	*Conservation surgery*		*Mastectomy*	
		No.	*%*	*No.*	*%*
1996/97	*3135*	*2449*	*78*	*601*	*19*
1997/98	*3384*	*2693*	*80*	*651*	*19*
1998/99	*3344*	*2697*	*81*	*618*	*18*
1999/00	*4150*	*3337*	*80*	*773*	*19*
2000/01	*4189*	*3363*	*80*	*796*	*19*
2001/02	*4233*	*3333*	*79*	*879*	*21*

Data from Scotland are absent in 1998/99

3.3.3 Treatment of Invasive Cancers According to Whole Tumour Size

Once again, screening services were asked to provide whole tumour size for invasive cancers (Table 56). The whole tumour size is the maximum diameter of the whole tumour, including any non-invasive component. Of the 7911 invasive cancers diagnosed, the whole size was not provided for 1294 (16%). 306 (24%) of these cancers were in London, 251 (19%) in South East (East) and 226 (17%) in South East (West).

Table 57 shows the whole size of small (<15mm) invasive tumours. Of the 4233 invasive cancers with invasive size <15mm, 2861 (68%) had whole size <15mm, 326 (8%) had whole size 15-19mm, 340 (8%) had whole size 20-49mm and 70 (2%) had whole size 50+mm. Whole size was unknown for 636 cases (15%). The following table shows how overall mastectomy rates varied with the size of the invasive tumour and with whole tumour size.

TREATMENT FOR INVASIVE CANCERS				
Size	***Invasive size mastectomy rates*** ***(Tables 52-55)***		***Whole size mastectomy rates for <15mm invasive tumours*** ***(Tables 58, 60-62)***	
	No.	***%***	***No.***	***%***
50+mm	*112/133*	*84*	*59/70*	*84*
20-49mm	*817/1837*	*44*	*154/340*	*45*
15-19mm	*406/1582*	*26*	*76/326*	*23*
<15mm	*879/4233*	*21*	*441/2861*	*15*

The mastectomy rate for 50+mm invasive tumours (84%) was the same as that for <15mm tumours with 50+mm whole size. The mastectomy rates for 20-49mmm and 15-19mm cancers were similar to <15mm invasive tumours with 20-49mmm and 15-19mm whole size respectively. However, for small tumours only 15% of tumours with whole size <15mm were treated with mastectomy compared with 21% of tumours with invasive size <15mm. This suggests that the presence of *in situ* disease accounts for a proportion of the mastectomies performed on tumours with invasive size <15mm.

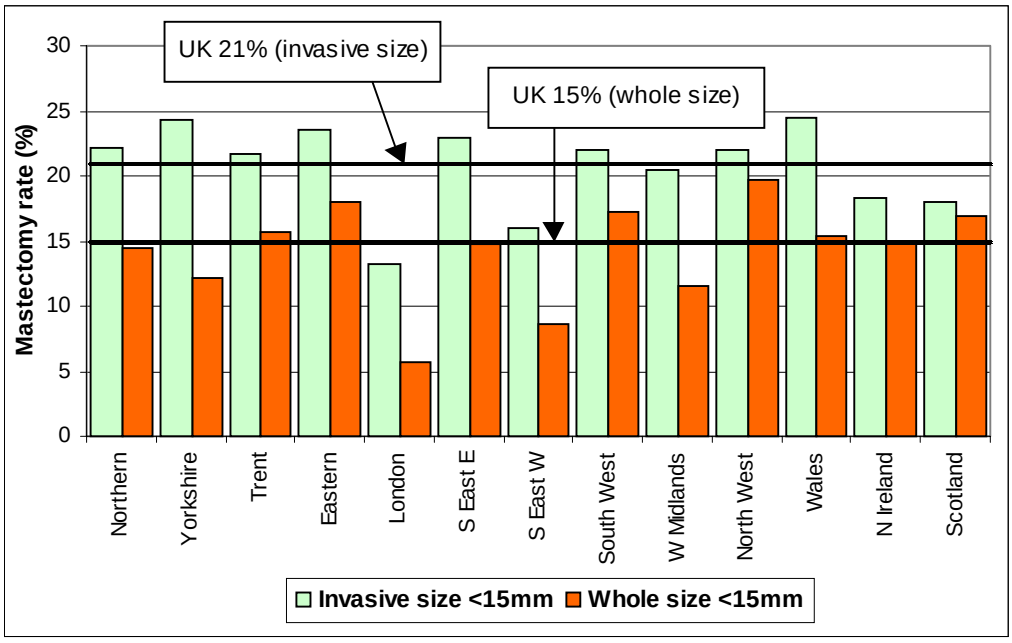

Figure 25 (Tables 52,58) : Variation in mastectomy rates for <15mm invasive size tumours and <15mm whole size invasive tumours

Figure 25 and the accompanying summary table illustrate the regional variation in mastectomy rates for tumours with invasive size <15mm and for tumours where the whole invasive size was <15mm. In every region, the mastectomy rate for tumours with whole size <15mm was lower than that for tumours with invasive size <15mm. These differences were, however, less marked in North West and Scotland, suggesting that in these regions the presence or absence of *in situ* disease may have less influence on the decision to undertake a mastectomy than in other parts of the UK.

TREATMENT OF INVASIVE CANCERS <15MM WITH WHOLE SIZE <15MM				
	<15mm invasive size (Table 52)		***<15mm whole size (Tables 58)***	
Region	***No.***	***%***	***No.***	***%***
Northern	48	22	20	14
Yorkshire	58	24	11	12
Trent	79	22	46	16
Eastern	103	24	62	18
London	47	13	8	6
South East (East)	80	23	24	15
South East (West)	53	16	13	9
South West	89	22	51	17
West Midlands	70	20	28	12
North West	111	22	88	20
Wales	65	25	28	15
Northern Ireland	15	18	9	15
Scotland	61	18	53	17
UK	**879**	**21**	**441**	**15**

COMMENT:

- In the UK as a whole, 70% of invasive breast cancers detected by the UK NHSBSP in 2001/02 underwent conservation surgery.
- Overall mastectomy rates increased according to the invasive tumour size, with 84% of 50+mm tumours being treated with mastectomy compared with 21% of small (<15mm) invasive tumours.
- The mastectomy rate for small (<15mm) invasive tumours rose slightly to 21% in 2001/02. This rate varied between 4% and 44% in individual screening units.
- For small tumours only 15% of tumours with whole size <15mm were treated with mastectomy compared with 21% of tumours with invasive size <15mm. This suggests that the presence of *in situ* disease accounts for a proportion of the mastectomies performed on tumours with invasive size <15mm.
- In every region, the mastectomy rate for tumours with whole size <15mm was lower than that for tumours with invasive size <15mm. These differences were, however, less marked in North West and Scotland, suggesting that in these regions the presence or absence of *in situ* disease may have less influence on the decision to undertake a mastectomy than in other parts of the UK.

4 LYMPH NODE STATUS AND INVASIVE GRADE

4.1 Lymph Node Status of Invasive Cancers

Quality Objective: To ensure that all necessary data are obtained for making decisions on adjuvant radiotherapy or adjuvant systemic therapy.

Outcome Measures & Standard: Histological node status should normally be obtained on all invasive tumours, either by sampling or clearance

N.B. ***A level 1 dissection (lower axilla) is up to the axillary vein and to the lateral border of pectoralis minor. For adequate sampling for invasive carcinomas, it is desirable to recognise and obtain a minimum of four lymph nodes.***

(Quality Assurance Guidelines for Surgeons in Breast Cancer Screening, NHSBSP Publication 20, April 1996)

4.1.1 Availability of Nodal Status for Invasive Cancers

Overall, nodal status was known for 94% of invasive cancers, varying from 86% in London to 99% in Yorkshire and Scotland (Table 63). The availability of nodal status for invasive cancers is shown for individual screening units in Figure 26. 16 screening services, with between 14 and 133 invasive cancers, supplied nodal status for 100% of their invasive cancers. In five units nodal status was unavailable more than 20% of invasive cancers.

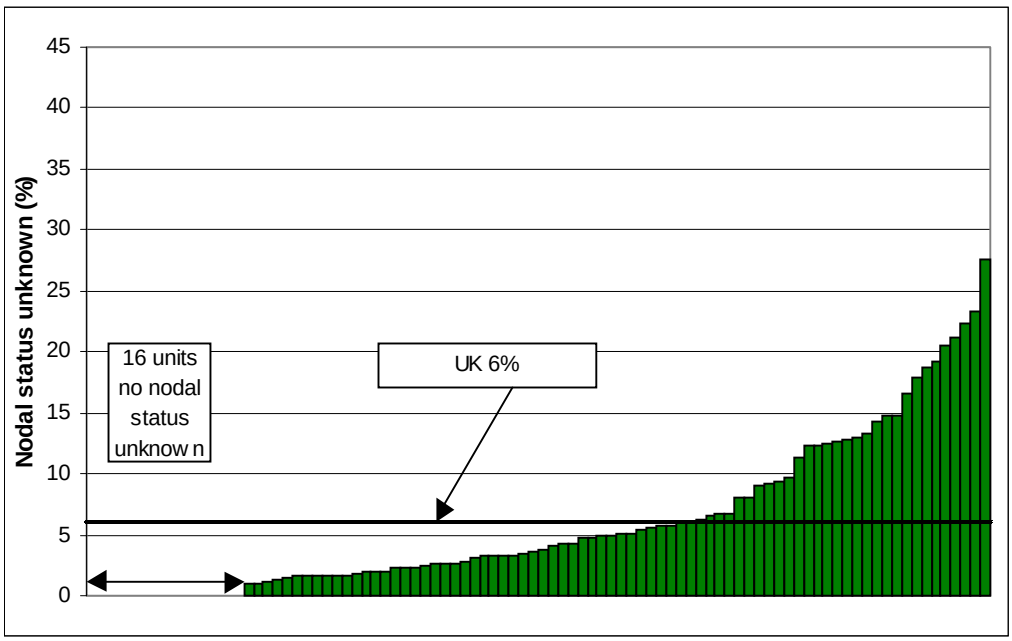

Figure 26 : Variation by unit in the availability of lymph node status for invasive breast cancers

Of the 7911 invasive cancers with known nodal status, 1830 (25%) had positive nodal status (Table 64). This is the same as the 25:75 ratio obtained in previous year's audits (shown in the following table) which has become known as the BASO constant for the NHSBSP.

6 YEAR COMPARISON: AVAILABILITY OF LYMPH NODE STATUS				
Year of data collection	Number of invasive cancers	% with nodal information	% of invasive cancers with known nodal status	
			Positive	Negative
1996/97	5860	81	26	74
1997/98	6427	87	25	75
1998/99	6200	90	26	74
1999/00	7675	93	25	75
2000/01	7945	93	25	75
2001/02	7911	94	25	75

Data from Scotland and Northern Ireland are absent in 1998/99

There was, however, considerable regional variation in lymph node status with the proportion of node positive cancers varying from 18% in Northern to 30% in South West. This variation is illustrated by individual screening unit in Figure 27. Regional QA reference centres and regional QA surgeons should audit the cases from units at the extreme ends of this distribution to ascertain the reasons for these unusual results.

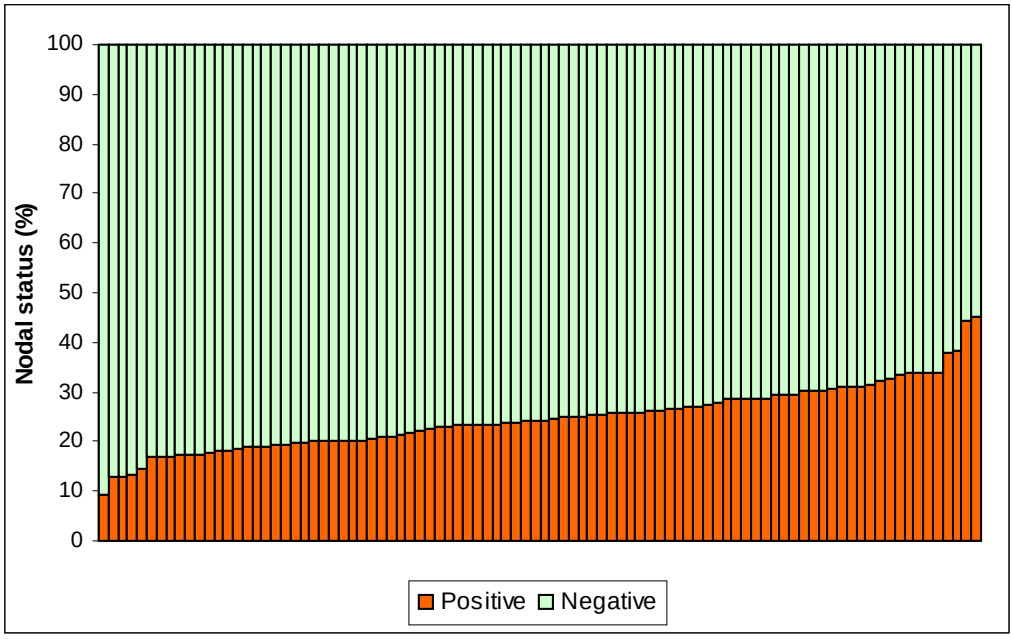

Figure 27 : Variation by unit in the lymph node status of invasive breast cancers

4.1.2 Number of Nodes Examined

The mean number of nodes examined in the UK was 11 nodes and the median 10 nodes (Table 65). The mean and median number of nodes examined were highest in Northern Ireland (17 and 15 respectively) and lowest in Northern and Trent (9 and 7 respectively in both regions).

Figures 28 and 29 show the proportion of invasive cancers for which nodal status was assessed on the basis of less than 4 nodes. Overall 5.1% of invasive cancers for which nodal status was recorded had fewer than 4 nodes examined. The slight increase in this figure, following the decreasing trend in previous years, may be explained by the advent of the sentinel node biopsy trial (ALMANAC). Overall, 56 (0.8%) of the invasive cancers with

known nodal status had negative nodal status determined on the basis of a sentinel node procedure. The majority of these cases were in Trent, South East (East), London and West Midlands. However, it is not clear whether all cases recorded as having a sentinel node procedure were correctly coded. Some of the 100 cases coded with sentinel node procedures for the audit had no nodes taken, more than 4 nodes taken or were in units not participating in the ALMANAC trial. Regional QA reference centres and regional QA surgeons should review these cases to ascertain whether or not screening units are undertaking sentinel node procedures outwith the recommended trial setting.

6 YEAR COMPARISON: NODAL STATUS ASSESSED ON THE BASIS OF <4 NODES		
Year of data collection	***Number of invasive cancers with known nodal status***	***% with <4 nodes examined***
1996/97	*4773*	*10.6*
1997/98	*5585*	*9.0*
1998/99	*5574*	*6.7*
1999/00	*7126*	*5.5*
2000/01	*7379*	*5.0*
2001/02	*7465*	*5.1*

Data from Scotland and Northern Ireland are absent in 1998/99

Overall 276 (3.7%) of the invasive cancers for which nodal status was recorded had negative status determined on the basis of fewer than 4 nodes without a sentinel node procedure (Table 66). Figure 28 shows that this varied from 0.7% in Northern Ireland (1 cancer) to 6.6% (23 cancers) in Northern.

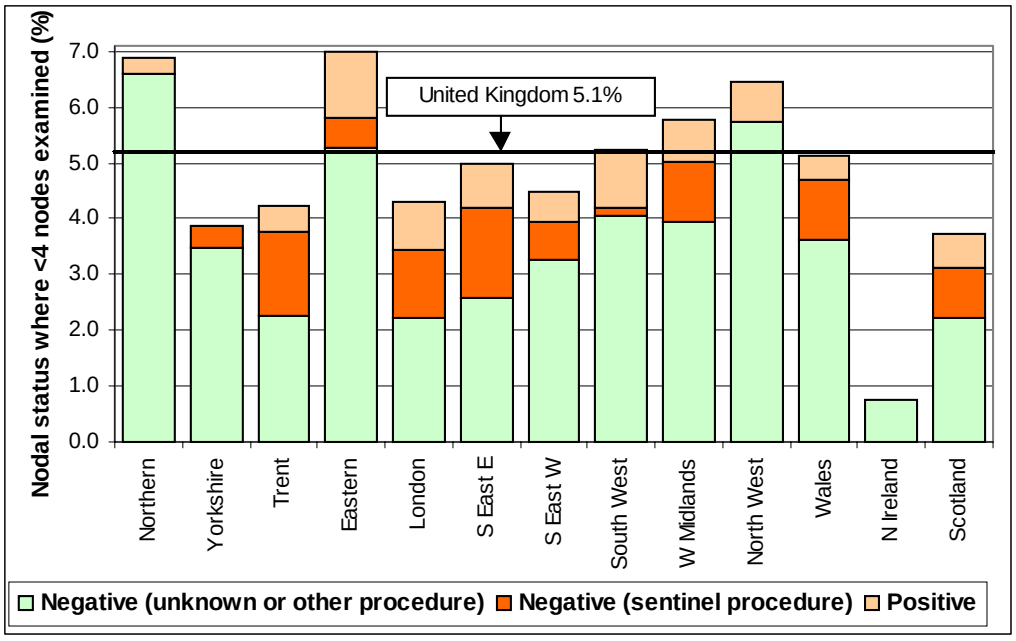

Figure 28 (Table 66) : Variation in nodal status for invasive cancers where nodal status was determined on the basis of <4 nodes, expressed as the percentage of invasive cancers with known nodal status

Figure 29 shows the proportion of invasive cancers in each screening unit for which nodal status was assessed on the basis of less than 4 nodes. Thirteen screening units determined the nodal status of every invasive cancers on the basis of 4 or more nodes. In a further ten screening units positive nodal status was determined on the basis of 1, 2 or 3 nodes or using a sentinel node. In one unit which did not employ sentinel node procedures, more than 20% of the 38 invasive cancers with known nodal status had negative nodal status determined on

fewer than 4 nodes. The regional QA reference centre and the regional QA surgeon should audit these cases to ascertain why the recommended diagnostic procedures do not appear to have been undertaken.

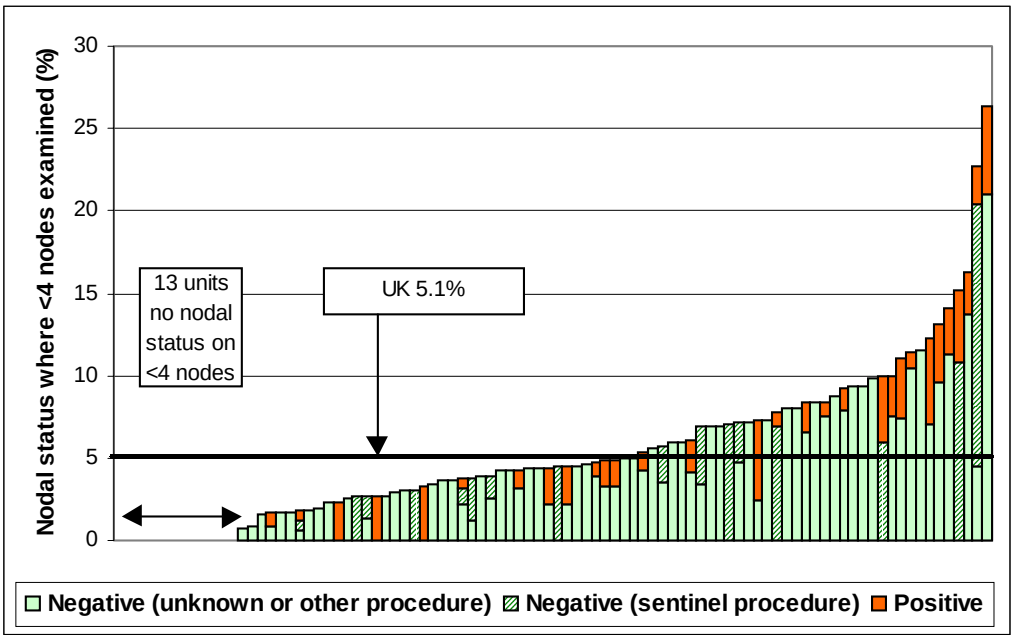

Figure 29 : Variation by individual screening unit in nodal status for invasive cancers where nodal status was determined on the basis of <4 nodes, expressed as the percentage of invasive cancers with known nodal status

Tables 63 and 66 show that of the 7911 invasive cancers detected in 2001/02, 446 (5.6%) had unknown nodal status, 50 (0.6%) had positive nodal status determined on the basis of 1,2 or 3 nodes and 276 (3.5%) had negative nodal status determined without a sentinel procedure on the basis of 1,2 or 3 nodes. Thus, 772 (9.8%) of the 7911 invasive cancers detected appear to have insufficient nodal information to provide a satisfactory diagnostic work-up. The variation by region, from 4.1% in Scotland to 16.5% in London is shown in the summary table below. Regional QA reference centres and regional QA surgeons should audit these cases to ascertain the reasons that a satisfactory diagnostic work-up was not achieved.

INVASIVE CANCERS WITH INSUFFICIENT NODAL INFORMATION						
Region	***Total invasive cancers***	***Unknown nodal status*** *(Table 63)*	***1, 2 or 3 nodes*** *(Table 66)*		***Insufficient nodal information***	
			Negative (unknown or other procedure)	***Positive***		
	No.	***No.***	***No.***	***No.***	***No.***	***%***
Northern	*357*	*9*	*1*	*23*	*33*	*9.2*
Yorkshire	*496*	*7*	*0*	*17*	*24*	*4.8*
Trent	*678*	*17*	*3*	*15*	*35*	*5.2*
Eastern	*807*	*65*	*9*	*39*	*113*	*14.0*
London	*677*	*94*	*5*	*13*	*112*	*16.5*
South East (East)	*644*	*24*	*5*	*16*	*45*	*7.0*
South East (West)	*629*	*47*	*3*	*19*	*69*	*11.0*
South West	*715*	*46*	*7*	*27*	*80*	*11.2*
West Midlands	*673*	*16*	*5*	*26*	*47*	*7.0*
North West	*923*	*85*	*6*	*48*	*139*	*15.1*
Wales	*483*	*14*	*2*	*17*	*33*	*6.8*
Northern Ireland	*148*	*13*	*0*	*1*	*14*	*9.5*
Scotland	*681*	*9*	*4*	*15*	*28*	*4.1*
UK	***7911***	***446***	***50***	***276***	***772***	***9.8***

The variation by individual screening unit in these parameters is shown in Figure 30.

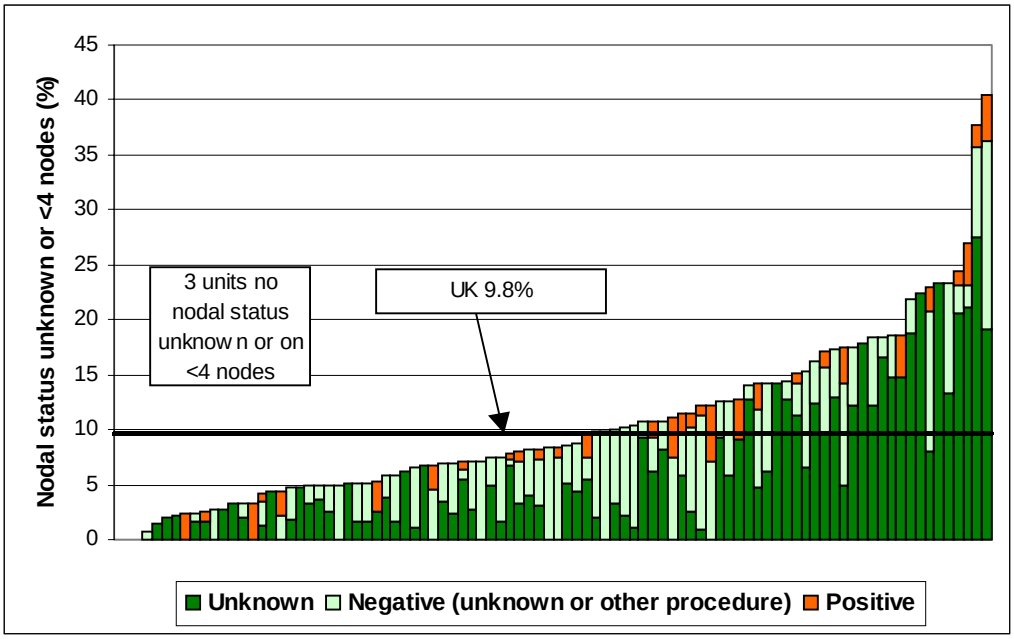

Figure 30 : Variation by individual screening unit in the proportion of invasive cancers with nodal status unknown, or with nodal status determined positive or negative on the basis of <4 nodes (excluding negative sentinel procedures).

4.2 Lymph Node Status of Non-Invasive Cancers

Of the 2109 non-invasive cancers, 24% had nodal status known. This proportion varied from 13% in Eastern to 39% in Trent and Northern (Figure 31). In London and Northern Ireland for 24 (12%) and 7 (16%) respectively of non-invasive cancers it was unknown whether nodes were taken.

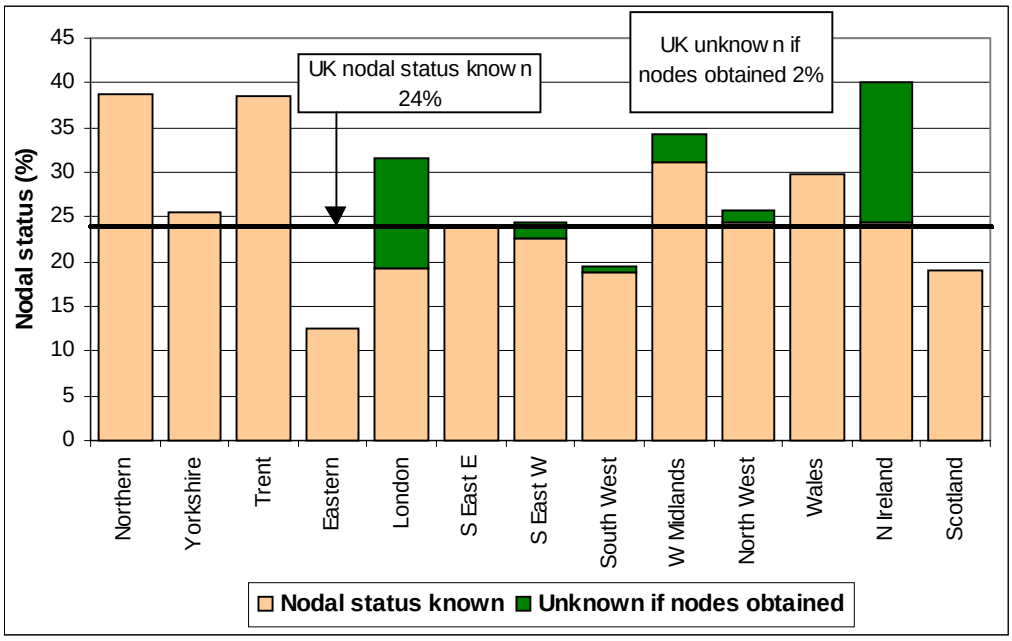

Figure 31 (Table 67) : Variation in the proportion of non-invasive cancers with nodal status recorded

Of the 512 non-invasive cancers with known nodal status, 9 (2%) had positive nodal status recorded (Table 68). This is consistent with 2% of cases having non-identified invasive disease or very small invasive disease removed during the diagnostic process. 3 of these were

in London and 3 in Wales. Regional QA reference centres and regional QA surgeons should audit these cases to ensure that the data are accurate.

COMMENT:

- Overall, nodal status was known for 94% of invasive cancers, varying from 86% in London to 99% in Yorkshire and Scotland.
- 1830 (25%) cancers had positive nodal status. There was considerable regional variation in lymph node status with the proportion of node positive cancers varying from 18% in Northern to 30% in South West. Regional QA reference centres and regional QA surgeons should audit the cases from units at the extreme ends of this distribution to ascertain the reasons for these unusual results.
- 3.7% of invasive cancers for which nodal status was recorded had negative status determined on the basis of fewer than 4 nodes without a sentinel procedure. This varied from 0.7% in Northern Ireland (1 cancer) to 6.6% (23 cancers) in Northern.
- Some of the 100 cases coded with sentinel node procedures were in units not participating in the ALMANAC trial. Regional QA reference centres and regional QA surgeons should review these cases to ascertain whether or not screening units are undertaking sentinel node procedures outwith the recommended trial setting.
- The 9 non-invasive cases with positive nodal status should be checked to ensure that the data are accurate.

4.3 Grade of Invasive Cancers

Of the 7911 invasive cancers detected in 2001/02, 2611 (33%) were Grade I, 3664 (46%) were Grade II and 1359 (17%) were Grade III. Grade was not assessable for 90 cases (1%). Grade was unknown for 187 cases (2%), varying from 0% (3 cases) in Trent to 5% (42 cases) in North West and 6% (39 cases) in London. These data are provided for each region in Table 69 and are shown for individual screening units in Figure 32. The proportion of grade I cancers varied between 4% and 60% in individual screening units. For those units with very high or low proportions of grade I tumours, regional QA reference centres and regional QA surgeons should audit a selection of cases to determine if the grading is accurate.

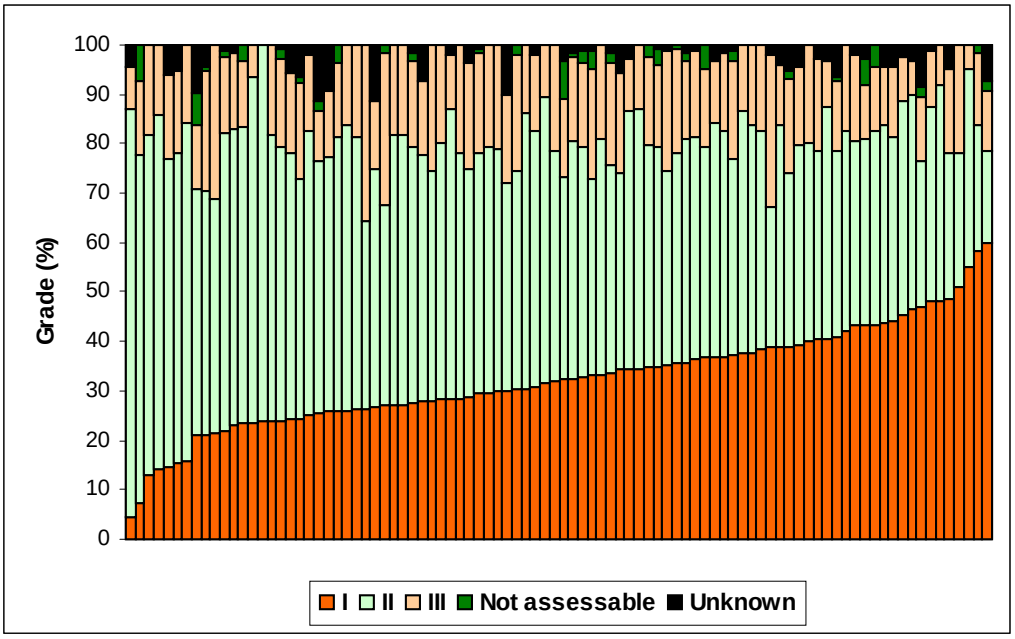

Figure 32 : Variation in the invasive grade of invasive cancers

5. SCREENING SURGICAL CASELOAD

There were 439 consultant breast surgeons working in the UK NHSBSP in 2001/02. This UK figure counts only once the 38 surgeons who worked in more than one screening unit. Throughout this section, each surgeon is credited with their total UK screening caseload.

392 of the 439 consultant surgeons were identified by their unique GMC registration code. A code other than the GMC code was provided for a further 41 surgeons, 30 of whom worked in Scotland. 6 screening units could not provide unique identifying codes for all their cases. It was assumed that the unknown surgeons at these 6 screening units are 6 individual surgeons who treated between 2 and 15 cancers.

The screening surgical caseload is shown for each region in Figure 33. The 38 surgeons working in more than 1 region appear in each region's figures. 133 surgeons (30%) treated 30-99 cases and 4 surgeons (1%) treated more than 100 cases. 74 surgeons (17%) treated 10-19 screening cases, 72 (16%) treated 20-29 cases, and 156 surgeons (36%) had a screening caseload of fewer than 10 cases.

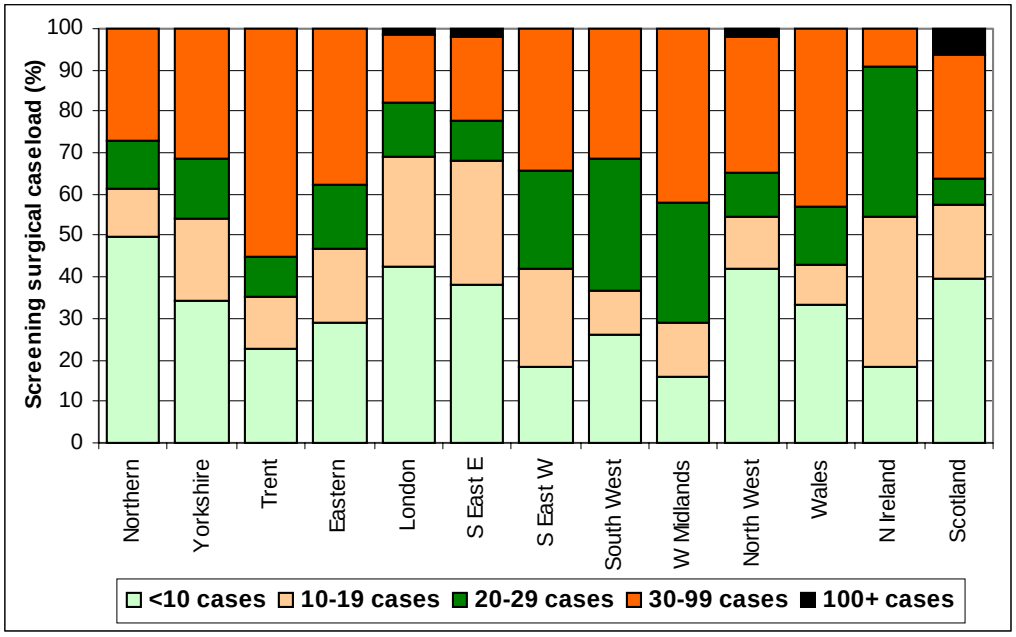

Figure 33 (Table 70): Variation in screening surgical caseload expressed as the number of cases per surgeon

The highest proportions of surgeons with a screening caseload of fewer than 10 were in Northern (50%), London (43%) and North West (42%). Surgical specialisation was most advanced in West Midlands, Northern Ireland and South East (West), where only 16-18% of surgeons treated fewer than 10 screening cases.

The median screening caseload per surgeon, and the interquartile range, are shown for each region in Figure 34. Overall the median was 18 screening cases, with a quarter of surgeons seeing more than 37 cases. The highest median was in Trent (33 cases) and the lowest in Northern (10 cases). The maximum screening caseload, seen by a surgeon in Scotland, was 137 cases. One surgeon who worked in London and South East (East) treated 102 screening cases.

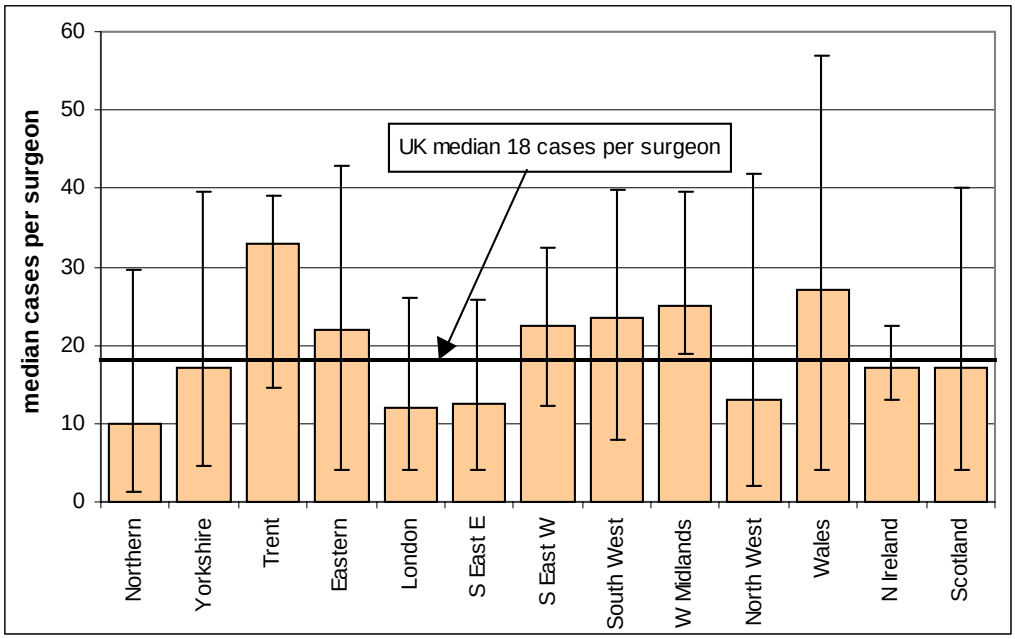

Figure 34 (Table 71): Variation in the median number of cases treated by individual surgeons, and the interquartile range

Table 72 shows the number of women treated by 2 or 3 surgeons and those with no surgery. Of the 10191 women with screen detected cancer in 2001/02, 108 (1%) had no surgeon, 122 (1%) were treated by 2 surgeons. 1 woman in South East (West) was treated by 3 consultant surgeons. Women treated by more than 1 surgeon appear in the UK screening caseload figure for each surgeon, giving a total number of 10207 treated cases.

Figure 35 shows the variation in the proportion of women treated by surgeons with differing screening caseloads. Of the 10207 women treated, 6466 (63%) were treated by a surgeon with a screening caseload of 30-99 cases. A further 456 women (4%) were treated by the 4 surgeons with screening caseload more than 100 cases. For 1769 women (17%) the treating surgeon had a screening caseload of 20-29 cases and for 1076 women (11%) the treating surgeon had a screening caseload of 10-19 cases. 440 women (4%) were treated by a surgeon with screening caseload of less than 10 cases. 76 (17%) of these women were in London.

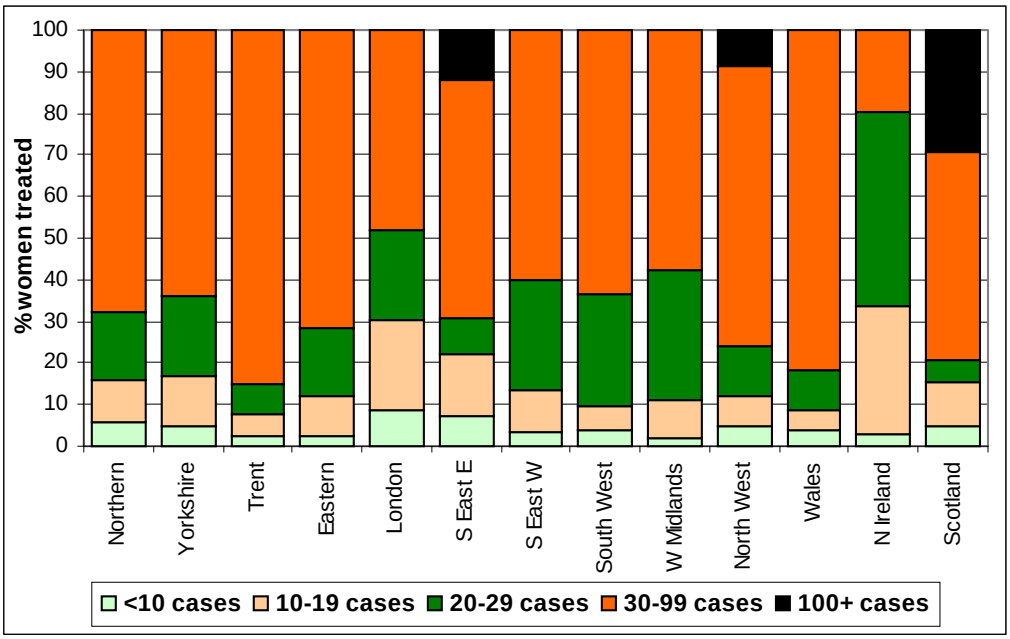

Figure 35 (Table 73): Variation in the proportion of women treated by surgeons with differing screening caseloads.

Each region was asked to provide reasons for all surgeons with a screening caseload of less than 10 cases. A list of 7 satisfactory reasons for low caseload were provided (see Appendix 2). If multiple reasons were given, only one was included. The reasons given for the surgeons with UK screening caseload less than 10 are shown in Figure 36.

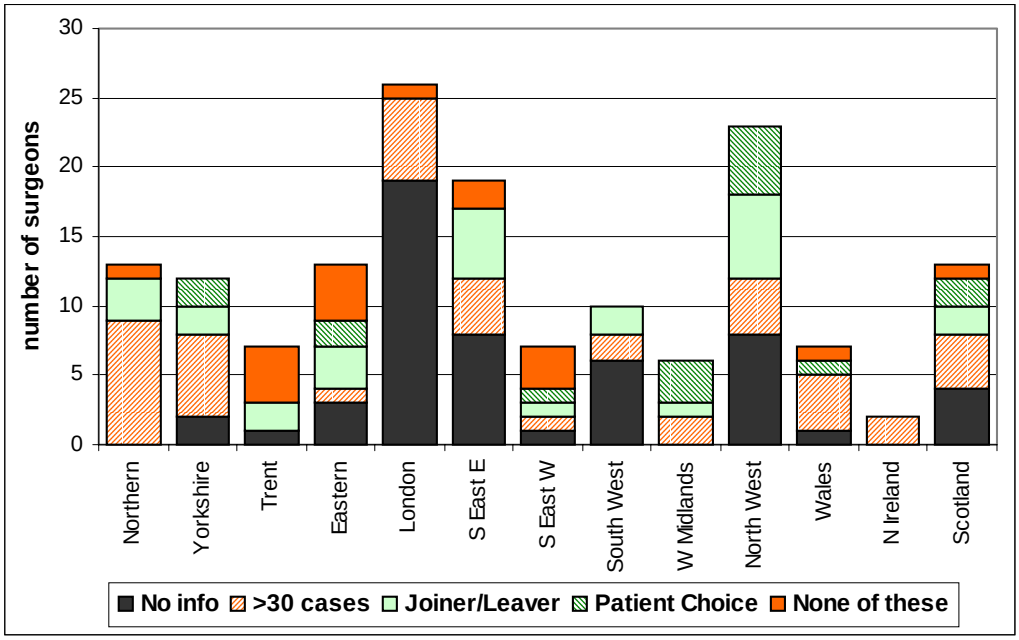

Figure 36 (Table 74): Explanations provided for surgeons treating <10 screening cases a year.

Of the 156 surgeons in the UK with a screening caseload of less than 10 cases, 45 (29%) treated more than 30 symptomatic breast cancers during 2001/02. 27 (17%) either joined or left the NHSBSP during 2001/02. 16 (10%) of the low caseload surgeons operated under patient choice. One of the other satisfactory reasons (plastic surgeon, private practice, no screening in area) was given for 14 surgeons (9%). A further 2 surgeons with low caseload,

in Northern and Scotland, provided cover for the usual surgeon. No information was available to explain the low screening caseload recorded for 52 surgeons (33%). 19 (37%) of these worked in London and 8 (15%) in South East (East) and 8 (15%) in North West.

COMMENT:

- There were 439 surgeons working in the UK NHSBSP in 2001/02.
- 68% of women with screen detected breast cancer were treated by a surgeon with a caseload of at least 30 screening cases. This shows that surgical specialisation is advanced in the UK NHSBSP.
- Surgical specialisation was most advanced in West Midlands, South East (West) and Northern Ireland, where less than 20% of surgeons treated fewer than 10 cases.
- 156 surgeons (36%) had a screening surgical caseload of less than 10 cases. No information was available to explain the low screening caseload recorded for 52 surgeons (33%). 19 of these worked in London, 8 in South East (East) and 8 in North West.

6. ADJUVANT THERAPY

Detailed tables giving full audit results are provided in Appendix 6 starting on p.120

For the second year, surgeons were asked to supply radiotherapy, chemotherapy and hormonal therapy start dates and Oestrogen Receptor (ER) status for cancers detected through screening during the 12 month period 1st October 2000 - 30th September 2001. The cut off point for treatment provided for these cancers was 30th June 2002.

6.1 Data Supplied for the Adjuvant Therapy Audit

Only cancers already submitted to the 2000/01 and 2001/02 main audits were eligible for the adjuvant therapy audit. The cases supplied to the adjuvant therapy audit were matched to the invasive status, nodal status and treatment data already supplied. Invasive grade was first requested in 2001/02.

Of the 10016 cancers in the UK detected between 1st October 2000 and 30th September 2001, 2132 (21%) had no adjuvant therapy data supplied. Either the surgeon did not take part in the audit, or it was not possible to collect these data. One screening service in Scotland withdrew from this part of the audit following concerns over data quality. A further 157 cancers (2%) did have some adjuvant data provided but were excluded for one of two reasons. Firstly, 121 cases were excluded if it was unknown whether they had received surgical treatment. Secondly, 36 cases with adjuvant therapy prior to the relevant screening episode were excluded. Thus 7727 cases (77%) were included in the adjuvant therapy audit. Table 75 shows the number of included cases in each region. The proportion of eligible cases with some adjuvant data supplied varied from 50% in Scotland to 99% in Trent.

The data completeness of each adjuvant therapy data item is shown in Table 76. Radiotherapy (RT), chemotherapy (CT) and hormonal therapy (HT) start dates were considered to be complete if a day, month and year were provided or if it was stated that the treatment was not given. These data are not complete. Some of these analyses should be treated with caution because it is probably easier to verify that a woman did not receive a given therapy than to provide a complete start date. However they do provide some interesting insights into the adjuvant treatment received by women with screen detected breast cancer.

Radiotherapy data were supplied for 7316 (73%) of the 10016 eligible cancers. Chemotherapy data were supplied for 7454 (74%) of the 10016 eligible cancers. It was hormonal therapy data which proved to be the most difficult to collect. These were available for 6734 (67%) of the 10016 cancers. Data completeness for hormonal therapy varied from 38% in Scotland and 46% in Northern to 94% in Wales and 99% in Trent. ER status was known for 5990 (60%) of the 10016 eligible cases. Data completeness for ER status varied between 42% in Northern and 79% in Northern Ireland.

Figure 37 shows the regional variation in data completeness. Overall, radiotherapy, chemotherapy and hormonal therapy data were complete for 6335 cases (63%). This varied between 36% in Scotland, 46% in Northern and 49% in Yorkshire to 93% in Wales and 98% in Trent. For some parts of this audit only radiotherapy and chemotherapy data are required, not hormonal therapy data. In total, 7115 cases (71%) had complete radiotherapy and chemotherapy data supplied, varying from 47% in Scotland to 95% in Wales and 98% in

Trent. Trent and North West were able to supply complete radiotherapy and chemotherapy data for over 900 individual cases.

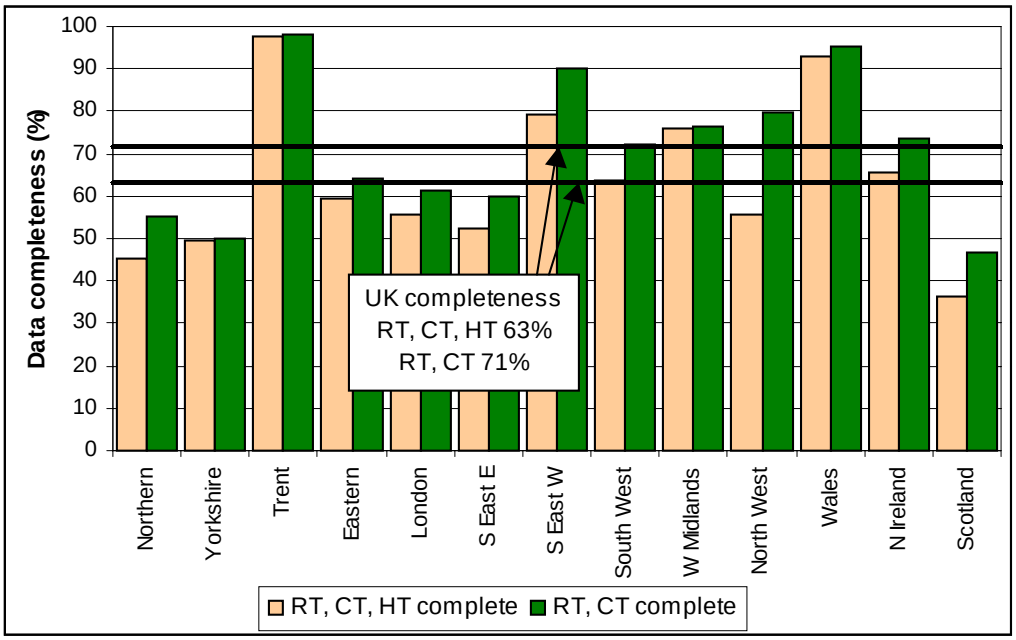

Figure 37 (Table 77) : Variation in the proportion of cases with complete RT, CT and HT data and those with complete RT and CT data, expressed as a proportion of all eligible cases.

All cases included in the adjuvant therapy audit had complete surgery data. 56 cancers (1%) had no surgery. 6032 (78%) cases had 1 surgical operation. This operation may have been diagnostic or therapeutic. 1639 cancers (21%) had more than 1 operation. Surgery data are shown for each region in Table 78. Tables 79 and 80 show that, of the 7115 cases with complete radiotherapy and chemotherapy data, 4614 (65%) had started radiotherapy before the audit cut off date. This varied between 57% in South East (East) and 78% in Northern. Only 1254 (18%) had received chemotherapy before the audit cut off date. This varied between 14% in Yorkshire and 31% in Northern Ireland. Table 81 shows that of the 6734 cases with hormonal therapy data supplied, 5004 (74%) had received hormonal therapy. This varied between 65% in London and 80% in South East (East), North West and Northern Ireland. ER status, shown in Table 82, was supplied for 5990 cases, of which 87% were ER Positive and 13% ER Negative. The proportion of ER positive cancers varied between 80% in Yorkshire and 95% in Wales.

COMMENT:

- Radiotherapy data were supplied for 73% of the 10016 cancers eligible for the adjuvant therapy audit, chemotherapy data for 74%, hormonal therapy data for 67% and ER Status for 60%.
- Overall, 6335 cases (63%) had complete radiotherapy, chemotherapy and hormonal therapy data.
- 7115 cases had complete radiotherapy and chemotherapy data. This varied from 47% in Scotland to 95% in Wales and 98% in Trent. Trent and North West were able to supply complete radiotherapy and chemotherapy data for over 900 individual cases.
- These data are not complete. Some of the analyses performed on the adjuvant data should be treated with caution because it is probably easier to verify that a woman did not receive a given therapy than to provide a complete start date. However they do provide some interesting insights into the adjuvant treatment received by women with screen detected breast cancer.

6.2 Time Between Assessment, Surgery, Radiotherapy, Chemotherapy and Hormonal Therapy

Tables 83 to 89 show the regional variation in the cumulative percentage of cases having various therapies within 14, 30, 60, 90 and 120 days. These time periods were chosen for illustrative purposes and do not correspond to any published standards, although the 30 day time period is approximately equivalent to the new waiting times standard from diagnosis to first treatment. The cumulative percentage curve for the UK as a whole is drawn as a solid line in each of the following figures. The dashed lines represent the regions with the maximum and minimum cumulative percentage at each point, so that the cumulative percentage curves for all regions can be drawn between the 2 dashed lines.

Figure 38 shows that 63% of cases underwent surgery within 30 days of assessment, and 93% within 60 days. In Northern Ireland, 49% of women underwent surgery within 14 days of their first assessment appointment, and 92% in 30 days. Only 37% of women in South East (East) and 44% in London underwent surgery within 30 days of their first assessment appointment.

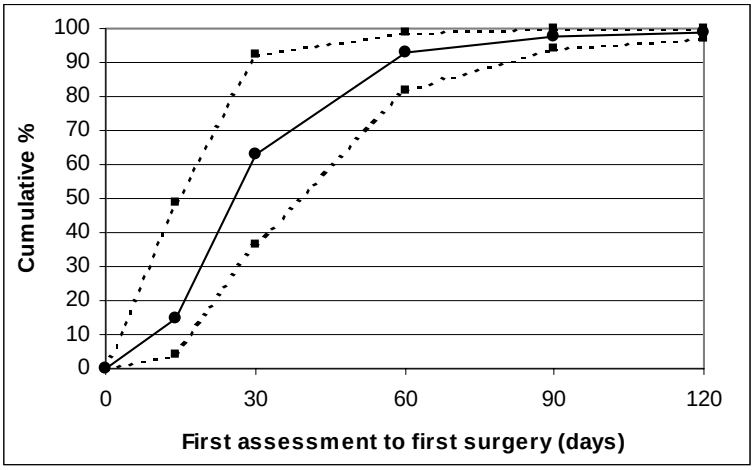

Figure 38 (Table 83) : The cumulative % of cases with first surgery up to 120 days after assessment.

The majority of screen detected breast cancers required only 1 operation. Figure 39 shows that 53% of the 1639 women undergoing more than 1 operation underwent all their operations within the same 30 day period. This varied from 35% in South East (East) to 81% in Northern Ireland. 90% of women underwent their final surgery within 60 days of their first surgery.

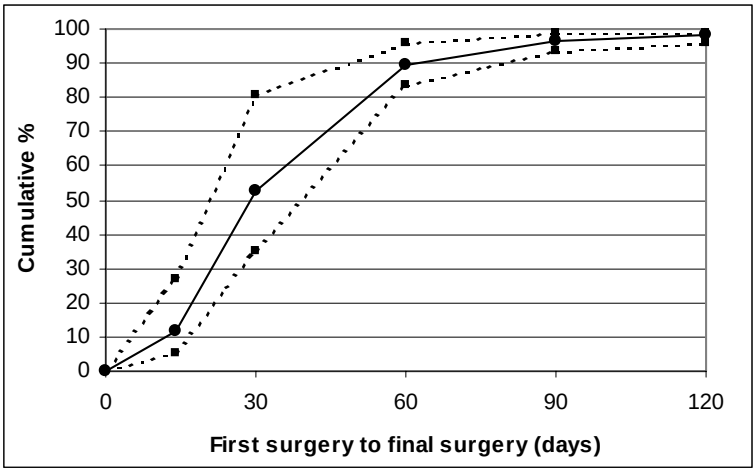

Figure 39 (Table 84) : The cumulative % of cases with more than 1 operation, that received final surgery up to 120 days after first surgery.

Figure 40 shows the variation in the time taken from first surgery to radiotherapy. Some cases had a second operation between first surgery and radiotherapy, but cases with chemotherapy between first surgery and radiotherapy were excluded. In the UK as a whole, only 32% of cases received radiotherapy within 60 days of first surgery, 65% within 90 days and 85% within 120 days. The proportion receiving radiotherapy within 60 days varied from 11% in South East (East), 17% in North West and 19% in South East (West) to 47% in South West and Scotland and 49% in Trent.

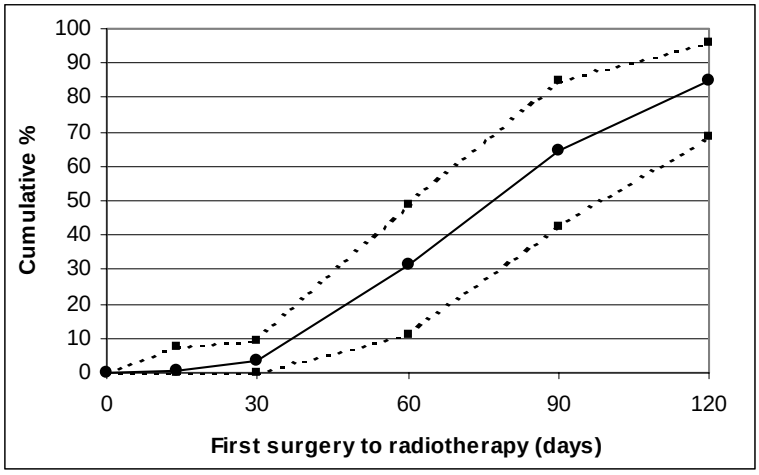

Figure 40 (Table 85) : The % of women receiving radiotherapy up to 120 days after first surgery.

Table 85 shows that in the UK as a whole only 133 women (4%) started their radiotherapy within 30 days of their first surgery. It would be interesting to identify within this group, women having a single conservative surgical operation so that an assessment can be made of the proportion whose treatment was in line with the targets set in the Joint Council for Clinical Oncology's report (published in July 1993) on reducing delays in cancer treatment.

Figure 41 shows the time from final surgery to radiotherapy. Again cases with chemotherapy before radiotherapy were excluded. In the UK as a whole, 37% of cases received radiotherapy within 60 days of final surgery, 70% within 90 days and 88% within 120 days. The proportion receiving radiotherapy within 60 days varied between 13% in South East (East) and 58% in Trent.

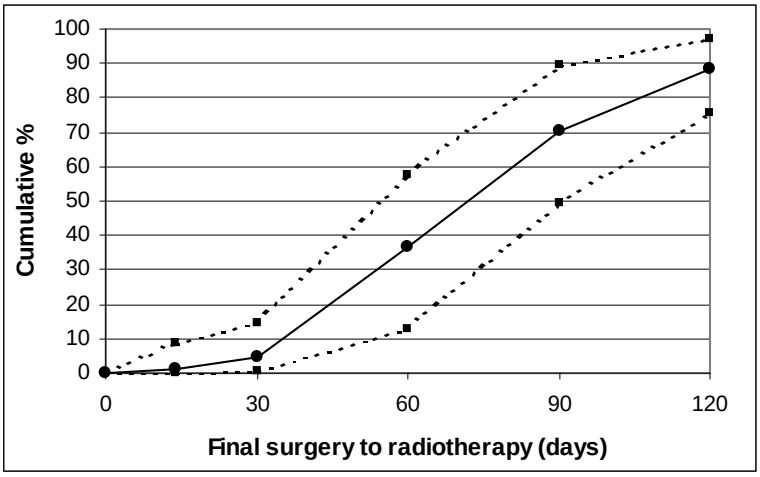

Figure 41 (Table 86) : The % of women receiving radiotherapy up to 120 days after final surgery.

Figure 42 shows the variation in time from first surgery to chemotherapy. Some cases had a second operation between first surgery and chemotherapy, but cases with radiotherapy between first surgery and chemotherapy were excluded. In the UK as a whole, 26% of cases started chemotherapy within 30 days of first surgery, 79% within 60 days and 94% within 90 days. There was wide variation in the proportion of cases receiving chemotherapy within 60 days of first surgery. This varied from 54% in Northern to 94% in Northern Ireland.

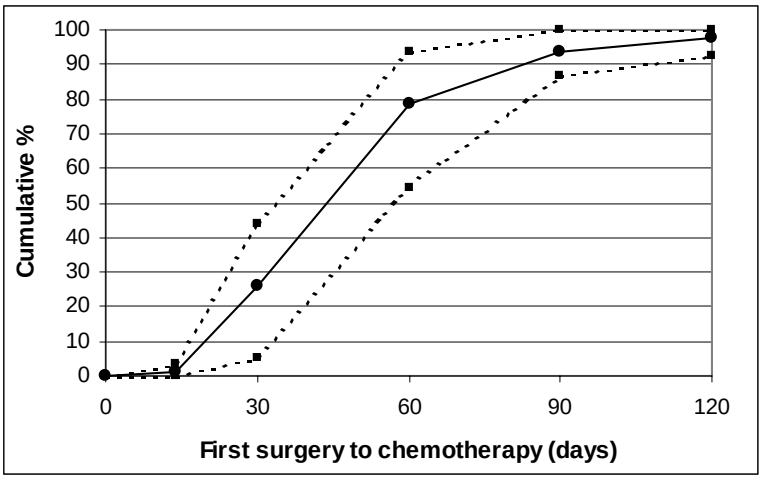

Figure 42 (Table 87): The % of women starting chemotherapy up to 120 days after first surgery.

Figure 43 shows that in the UK as a whole, 87% of cases started chemotherapy within 60 days of final surgery, rising to 96% within 90 days.

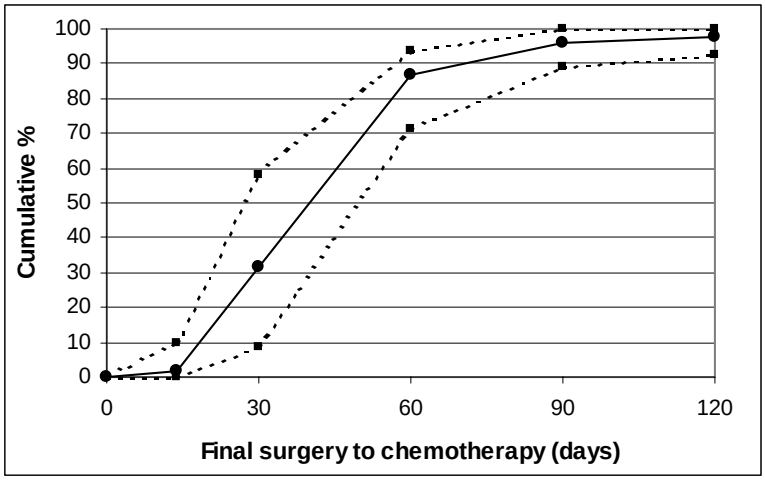

Figure 43 (Table 88) : The % of women starting chemotherapy up to 120 days after final surgery.

Figure 44 shows that, of the 5004 cases receiving hormonal therapy, 579 (12%) started this therapy before surgery. The practice of starting women on hormonal therapy before surgery was most prevalent in South West (29%), South East (East) (26%) and West Midlands (23%). Recently, this practice has been questioned because of the potential thromboembolic effects of tamoxifen. In addition, it is possible that the ER status had not been determined before tamoxifen treatment was started. In regions where women are most frequently started on hormone therapy before surgery, QA reference centres and QA surgeons should raise these issues with their screening units. In Northern and Northern Ireland none of the cases included in this audit started hormonal therapy before surgery. Of the 4399 women who did receive hormonal therapy after surgery, 38% had commenced the therapy within 14 days, 66% within 30 days and 83% within 60 days.

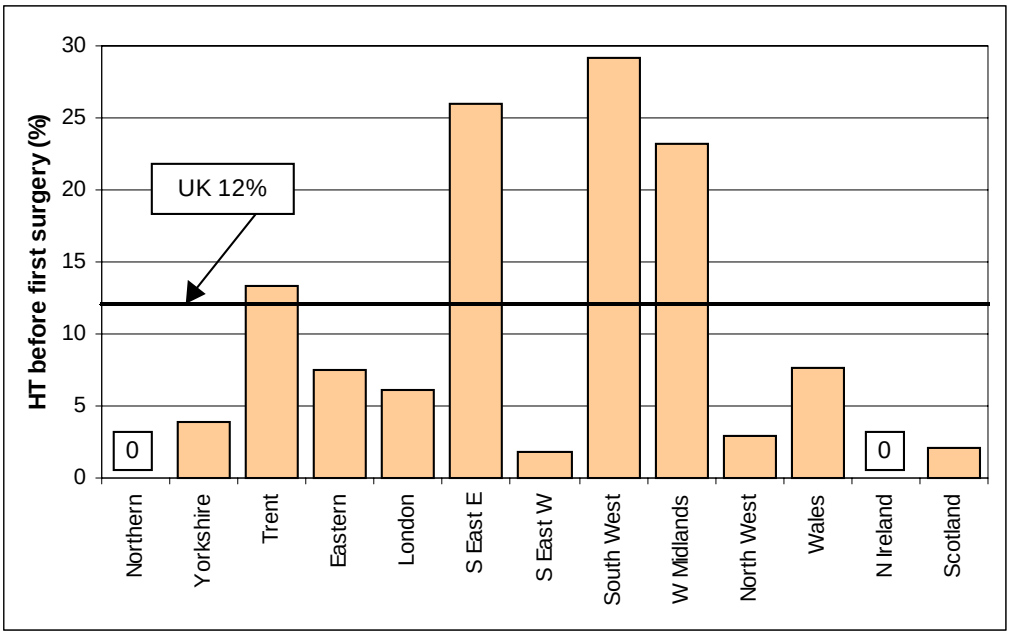

Figure 44 (Table 89) : The variation in the proportion of women starting hormonal therapy before first surgery

COMMENT:

- In the UK as a whole, 63% of cases underwent surgery within 30 days of assessment. This varied between 37% in South East (East) and 92% in Northern Ireland. This result does not compare favourably with the new waiting times targets which require 100% of women to have their first treatment within 4 weeks of the date of their diagnosis.
- 32% of cases received radiotherapy within 60 days of first surgery, 65% within 90 days and 85% within 120 days. The proportion receiving radiotherapy within 60 days varied from 11% in South East (East), 17% in North West and 19% in South East (East) to 47% in South West and Scotland and 49% in Trent.
- 37% of cases received radiotherapy within 60 days of final surgery. This varied between 13% in South East (East) and 58% in Trent.
- In the UK as a whole only 133 women (4%) started their radiotherapy within 30 days of their first surgery. It would be interesting to identify within this group, women having a single conservative surgical operation so that an assessment can be made of the proportion whose treatment was in line with the targets set in the Joint Council for Clinical Oncology's report (published in July 1993) on reducing delays in cancer treatment.
- 79% of cases received chemotherapy within 60 days of first surgery, varying from 54% in Northern to 94% in Northern Ireland.
- Overall, 579 cases (12%) commenced hormonal therapy before surgery.
- The practice of starting women on hormonal therapy before surgery was most prevalent in South West (29%), South East (East) (26%) and West Midlands (23%). Recently, this practice has been questioned because of the potential thromboembolic effects of tamoxifen. In addition, it is possible that the ER status had not been determined before tamoxifen treatment was started. In regions where women are most frequently started on hormone therapy before surgery, QA reference centres and QA surgeons should raise these issues with their screening units.

6.3 Order of Surgery, Radiotherapy and Chemotherapy

For those 7115 cases with complete radiotherapy and chemotherapy data, the order of treatments was determined. For this analysis hormonal therapy was ignored. The term "surgery" refers to one or multiple operations provided that no adjuvant therapy was given between first and final surgery.

The majority of cases (3603, 51%) underwent one or more operations followed by radiotherapy. This was the most popular order of treatments in all regions. In Northern 66% of cases undertook this treatment pathway. In the UK as a whole, 2203 cases (31%) only received surgery, and 887 cases (12%) had surgery followed by chemotherapy and then radiotherapy. Other variations included surgery to chemotherapy (239 cases, 3%) and surgery to radiotherapy to chemotherapy (46 cases, 1%). Surgery to radiotherapy to chemotherapy was most common in Northern Ireland where the highest proportion of cases received chemotherapy (31%, compared to 18% in the UK as a whole (Table 80)).

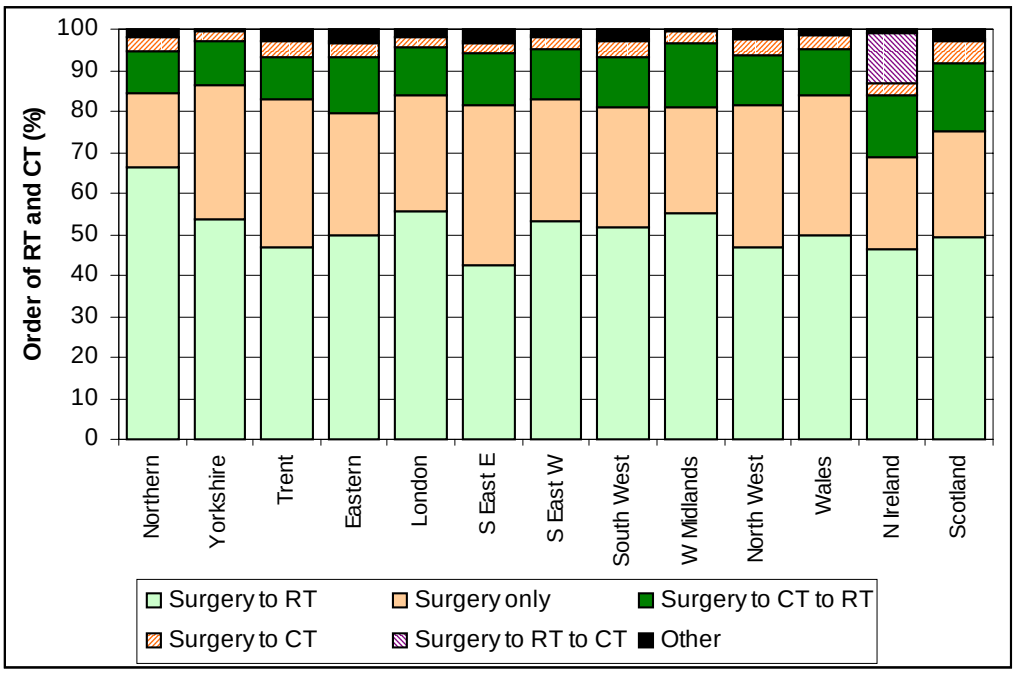

Figure 45 (Table 90) : Variations in the order of surgery, radiotherapy and chemotherapy

6.3.1 Variations in the Time From Assessment to Final Treatment

The number of days from the first assessment appointment to the start of the final therapy clearly depends on the number of therapies given. The median time in days from assessment to final therapy was 36 days for women undergoing surgery alone, compared to 104 days for assessment to surgery followed by radiotherapy and 210 days for assessment to surgery followed by chemotherapy followed by radiotherapy. The regional variation is shown in Figure 46.

In London and South East (East) the median number of days from assessment to final treatment for women receiving surgery alone was 48 days, compared to 36 days in the UK as a whole. In Northern Ireland the median was 21 days (3 weeks). The time from assessment to radiotherapy for women receiving surgery followed by radiotherapy varied between 89 days in Trent and 90 days in Scotland to 139 days in South East (East). The time from assessment to radiotherapy for women receiving surgery followed by chemotherapy followed

by radiotherapy varied from 148 days in Northern Ireland to 231 days in South East (East) and North West and 232 days in London.

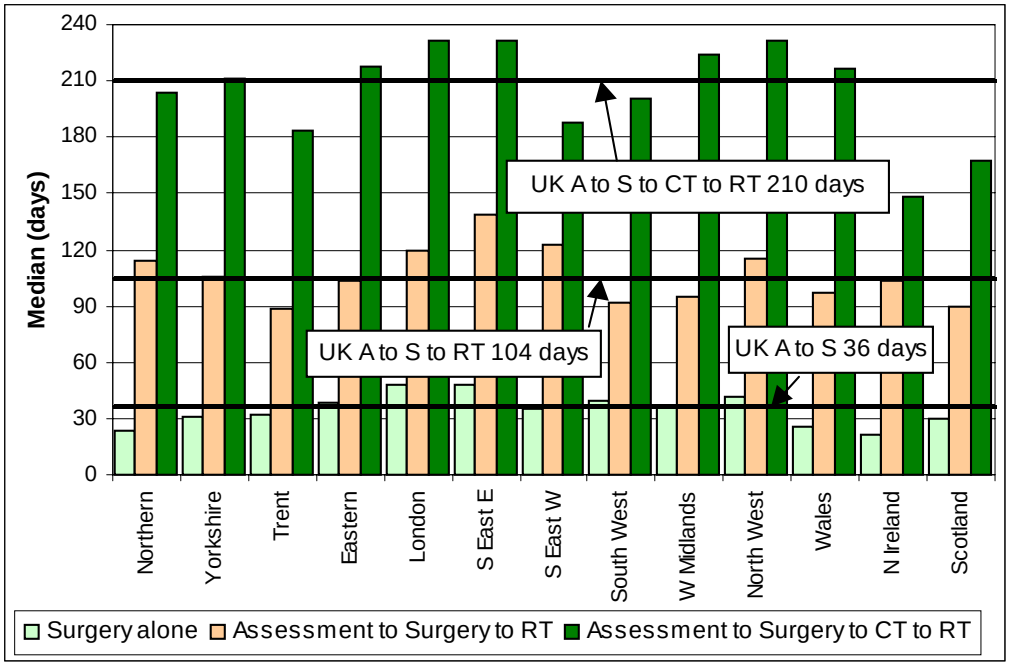

Figure 46 (Table 91) : Median number of days from assessment to final therapy, according to various treatment orders

COMMENT:

- 3603 (51%) of the 7115 cases with complete radiotherapy and chemotherapy data underwent one or more operations followed by radiotherapy. This was the most popular order of treatments in all regions.
- The median time in days from assessment to final therapy was 36 days for women undergoing surgery alone, compared to 104 days for assessment to surgery followed by radiotherapy and 210 days for assessment to surgery followed by chemotherapy followed by radiotherapy.

6.4 Variations in Combinations of Treatment According to Tumour Characteristics

This section examines the combination of treatments given to tumours with various prognostic characteristics. It is clear that different screening units followed different surgical protocols. It is hoped that by presenting analyses for three specific propositions, an informative discussion to agree best practice can take place.

Proposition 1 :	Women treated with conservative surgery should normally receive radiotherapy

Of the 7316 cases in the UK as a whole with radiotherapy data available, 5217 (71%) had conservation surgery (Table 92). Of these, 987 (19%) did not have radiotherapy before the audit cut-off date of 30th June 2002. This varied from 10% in Northern to 23% in South East (East) and South East (West) (Table 93). The invasive status of the 5217 conservatively treated cases with radiotherapy data available is shown in Table 94. Figure 47 shows the variation in the proportion of invasive cancers and non-invasive cancers that did not receive radiotherapy.

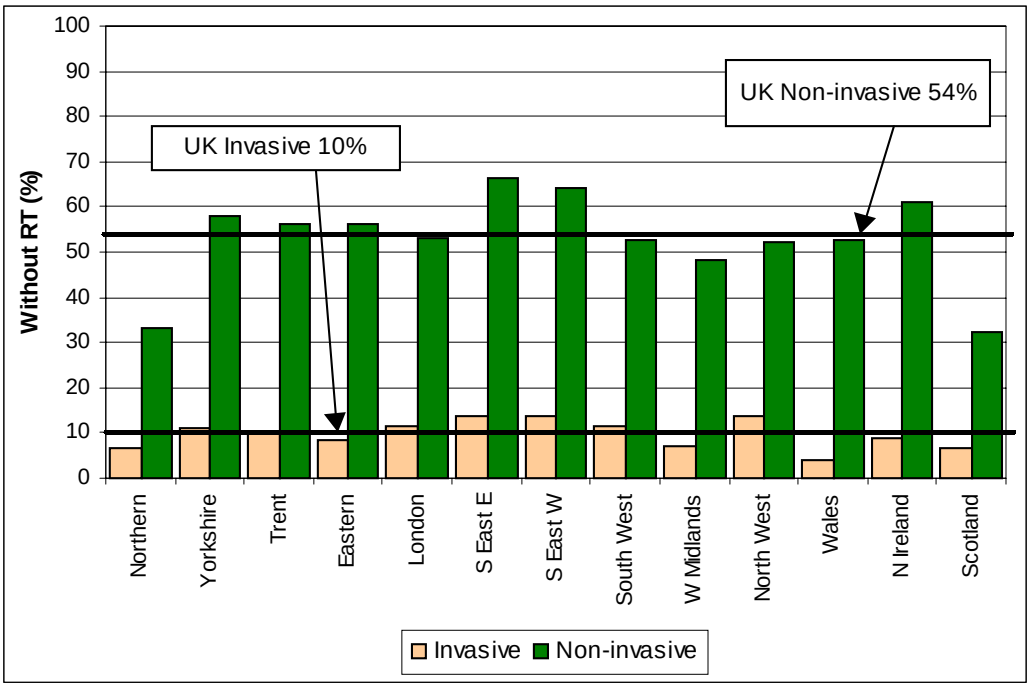

Figure 47 (Tables 95,96) : The variation in the proportion of conservatively treated invasive cancers that did not receive radiotherapy compared with the proportion of conservatively treated non-invasive cancers that did not receive radiotherapy.

Of the 4153 conservatively treated invasive cancers with known radiotherapy data, 3722 (90%) received radiotherapy and 431 (10%) did not receive radiotherapy before the audit cut-off date. The proportion of conservatively treated invasive cancers that did not receive radiotherapy varied from 4% in Wales to 12% in London and 14% in North West, South East (East) and South East (West) (Figure 47 and Table 95).

Of the 1010 non-invasive cancers with known radiotherapy data, 468 (46%) received radiotherapy and 542 (54%) did not receive radiotherapy before the audit cut-off date. The proportion of conservatively treated non-invasive cancers that did not receive radiotherapy varied from 33% in Northern and 32% in Scotland to 66% in South East (East) and 64% in South East (West) (Figure 47 and Table 96).

Conclusion 1 :	90% of women with invasive cancers treated with conservative surgery did receive radiotherapy but only 46% of women with non-invasive cancers treated with conservative surgery also had radiotherapy. This difference probably arises because the potential benefits of radiotherapy for women with conservatively treated non-invasive breast cancer have only recently been reported.

Proposition 2 :	Women with ER negative, node positive invasive tumours should normally receive chemotherapy

Of the 7454 cancers with known chemotherapy data, 170 (2%) were recorded as ER negative node positive invasive cancers and 401 (5%) were recorded as ER negative node negative invasive cancers (Table 97).

Of the 170 ER negative node positive invasive cancers, 143 (84%) started chemotherapy and 27 (16%) did not start chemotherapy before the audit cut off date (Table 98). The proportion

of ER negative node positive invasive cancers that did not start chemotherapy varied from 0% (0 cases of 9) in Scotland, 5% (1 cancer of 20) in South West and 6% (1 cancer of 17) in West Midlands to 26% in Trent and North West (5 cancers of 19 in both regions).

In contrast, of the 401 ER negative node negative invasive cancers, 186 (46%) started chemotherapy and 215 (54%) did not start chemotherapy before the audit cut off date (Table 99). The proportion of ER negative node negative invasive cancers that did not start chemotherapy varied from 27% (6 cancers of 22) in Northern Ireland to 84% (27 cancers of 32) in London. This comparison is shown by region in Figure 48.

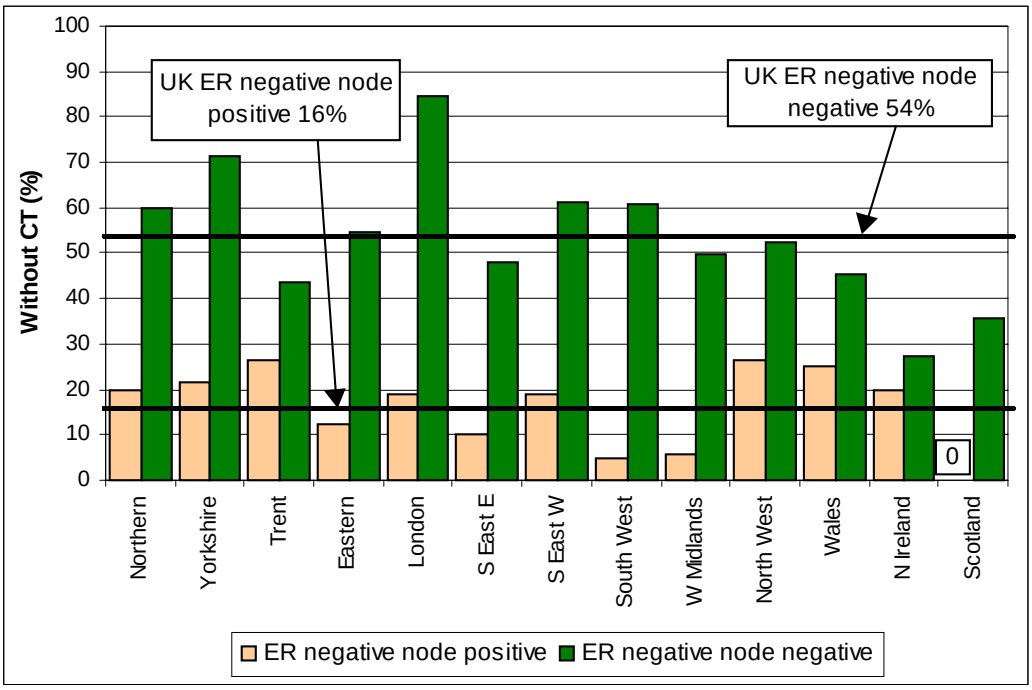

Figure 48 (Tables 98,99) : The variation in the proportion of ER negative node positive invasive cancers that did not receive chemotherapy compared with the proportion of ER negative node positive invasive cancers that did not receive chemotherapy.

Conclusion 2 :	84% of women with ER negative, node positive invasive tumours did receive chemotherapy. In addition, 46% of ER negative, node negative invasive cancers had chemotherapy. It would be interesting to examine the grade of these tumours to see if this was the factor influencing the decision to give chemotherapy to these women.

Proposition 3 :	Hormonal therapy (eg. Tamoxifen) is only beneficial to women with ER positive tumours

Of the 6734 cases with known hormonal therapy data, 5369 (80%) were invasive, 75 (1%) micro-invasive and 1273 (19%) non-invasive. 17 had unknown invasive status. These data are shown by region in Table 100. 18% of the 6734 cases with known hormonal therapy data had unknown ER status (Table 101). This varied from 8% in Northern Ireland to 38% in Wales. In some units, ER status is not routinely obtained for non-invasive cancers. However, Table 102 shows that of the 4766 ER positive cancers, 346 (7%) were non-invasive, varying from 1% in Wales to 12% in North West.

Of the 1231 cases with unknown ER status, 401 were invasive, 31 were micro-invasive and 794 were non-invasive (Table 104). The remaining 5 cases had unknown invasive status. Therefore 7% of invasive cancers had unknown ER status, varying from 1% in Northern Ireland and Scotland to 22% in Northern and 23% in Wales. 62% of non-invasive cancers had unknown ER status, varying from 32% in Northern to 98% in Wales. This regional variation is shown in Figure 49.

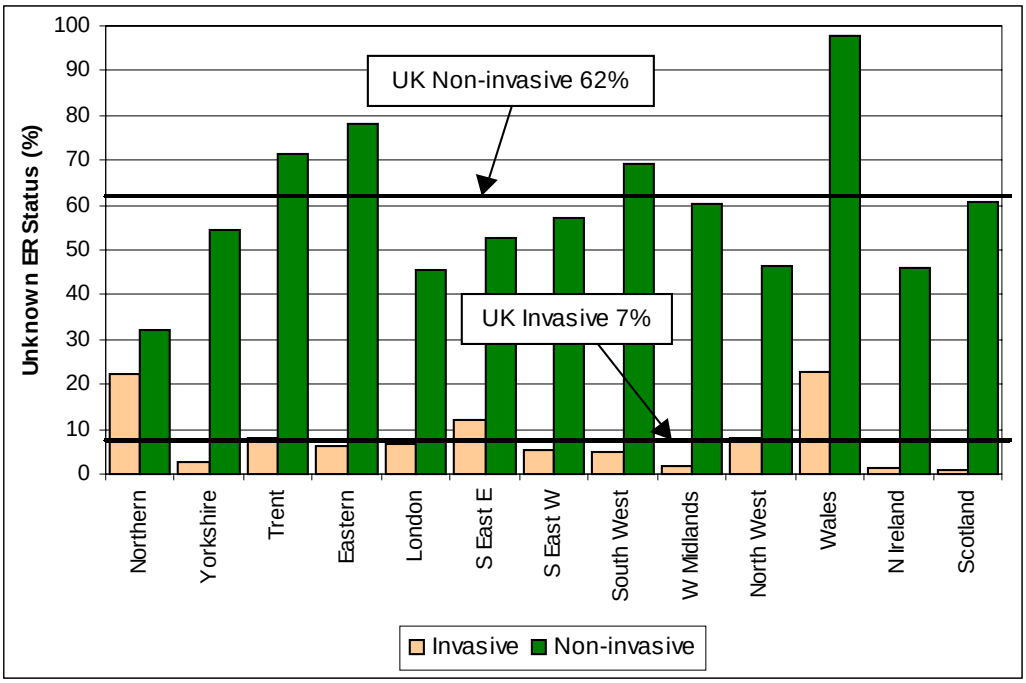

Figure 49 (Table 104) : The variation in the proportion of invasive and non-invasive cancers with unknown ER status.

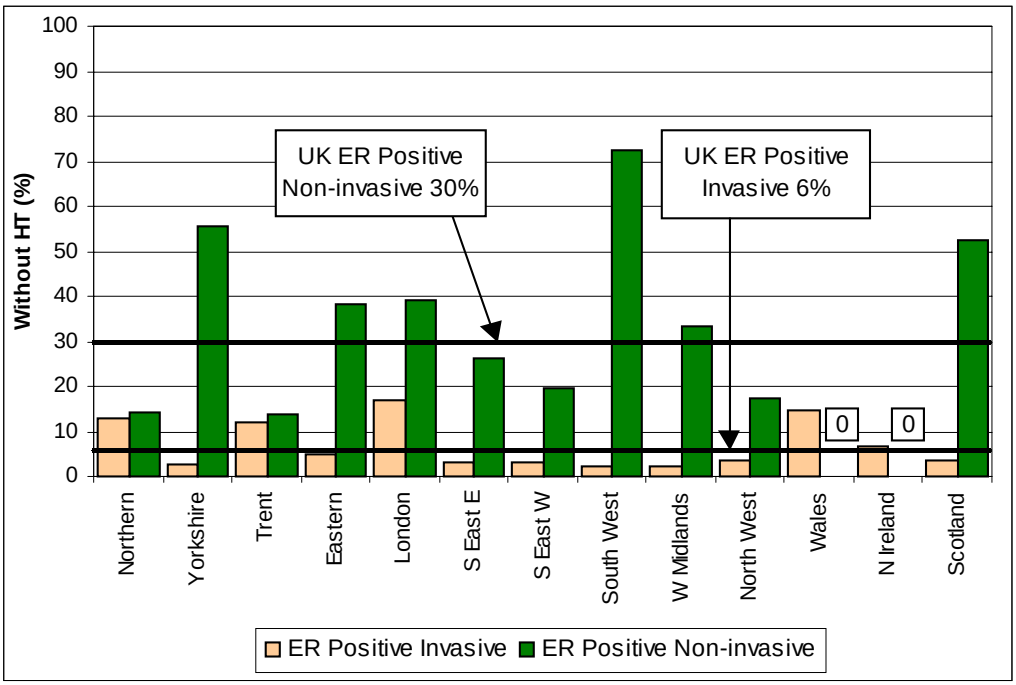

Figure 50 (Tables 106,107) : The variation in the proportion of ER positive invasive and ER positive non-invasive cancers which did not receive hormonal therapy.

In the UK as a whole, 8% of ER positive cancers did not receive hormonal therapy. This varied from 4% in Yorkshire, South East (West) and West Midlands to 19% in London (Table 105). Overall, 6% of ER positive invasive cancers and 30% of ER positive non-invasive cancers did not receive hormonal therapy. The variation by region is shown in Figure 50. In London (17%), Wales (15%), Northern (13%) and Trent (12%), more than 10% of women with ER positive invasive tumours did not receive hormonal therapy. In South West (72%), Yorkshire (56%) and Scotland (52%) more than 50% of women with ER positive, non-invasive tumours did not receive hormone therapy. In the UK as a whole, 18% of women with ER negative cancers received hormonal therapy (Figure 51). This varied from 2% in Trent, 3% in Scotland and 4% in Northern Ireland to 32% in South East (East) and 33% in Wales. It is possible that these women were progesterone receptor positive. However, given the emerging data concerning the possible complications associated with the use of Tamoxifen, regional QA reference centres and regional QA surgeons should encourage their screening units to carefully review their policies relating to the prescribing of Tamoxifen to women with ER negative tumours. In the UK as a whole, 497 (40%) of the 1231 cases with unknown ER Status received hormonal therapy. This varied from 9% in Scotland to 80% in Northern (Table 109).

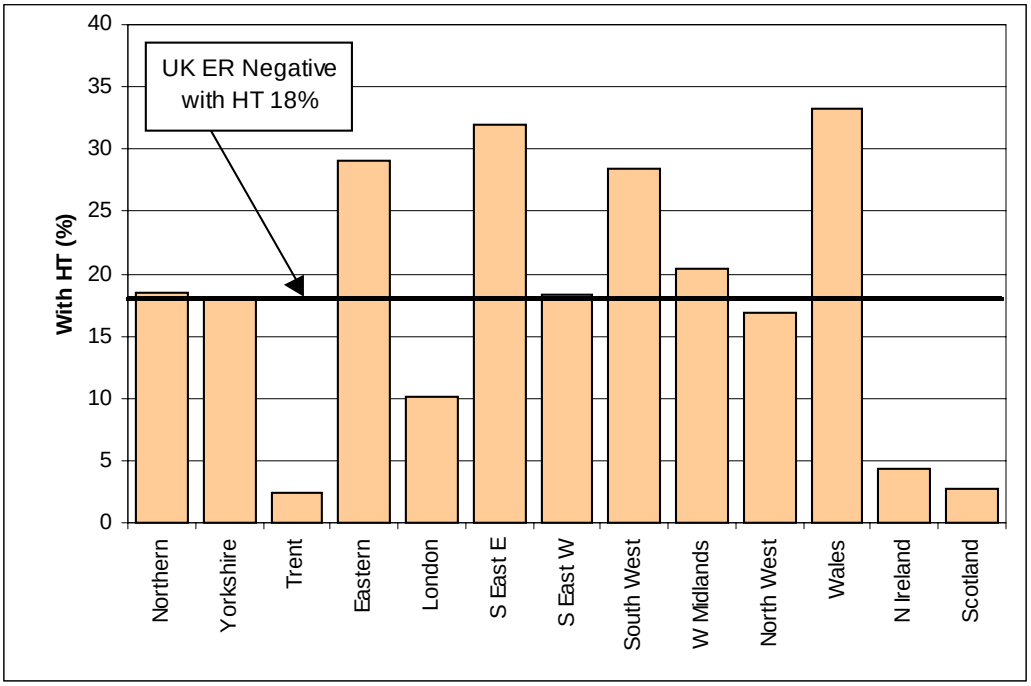

Figure 51 (Table 108) : The variation in the proportion of ER negative invasive cancers that received hormonal therapy.

Conclusion 3 :	94% of women with ER positive invasive cancers and 70% of ER positive non-invasive cancers received hormone therapy. This difference probably reflects the relative uncertainty of the benefits of hormone therapy for women with non-invasive tumours. In addition, 18% of women with ER negative cancers and 40% of women with tumours of unknown ER status were prescribed hormone therapy. Given the emerging data concerning the possible complications associated with the use of Tamoxifen, regional QA reference centres and regional QA surgeons should encourage their screening units to carefully review their policies relating to the prescribing of Tamoxifen to women with ER negative cancers.

Table 6.4A provides a regional summary of the proportion of cancers in each region which did not receive treatment consistent with propositions 1, 2 and 3 presented in this section.

TABLE 6.4 A : SUMMARY OF PROPOSITIONS 1,2 AND 3

Region	Proposition 1 Conservation surgery, no RT				Proposition 2 ER negative node positive invasive no CT (Table 98)		Proposition 3 ER positive no HT (Table 105)		Proposition 3 ER negative with HT (Table 108)	
	Invasive (Table 95)		Non-invasive (Table 96)							
	No.	%	No.	%	No.	%	No.	%	No.	%
Northern	*11/167*	*7*	*10/30*	*33*	*37742*	*20*	*17/133*	*13*	*5/27*	*19*
Yorkshire	*21/190*	*11*	*25/43*	*58*	*3/14*	*21*	*11/248*	*4*	*11/61*	*18*
Trent	*46/443*	*10*	*73/130*	*56*	*5/19*	*26*	*76/633*	*12*	*2/84*	*2*
Eastern	*28/340*	*8*	*53/94*	*56*	*2/16*	*13*	*28/430*	*7*	*16/55*	*29*
London	*44/377*	*12*	*50/94*	*53*	*3/16*	*19*	*77/402*	*19*	*7/69*	*10*
South East (East)	*41/295*	*14*	*43/65*	*66*	*1/10*	*10*	*20/349*	*6*	*15/47*	*32*
South East (West)	*61/449*	*14*	*65/101*	*64*	*3/16*	*19*	*18/444*	*4*	*15/82*	*18*
South West	*50/436*	*11*	*58/110*	*53*	*1/20*	*5*	*33/485*	*7*	*19/67*	*28*
West Midlands	*27/391*	*7*	*38/79*	*48*	*1/17*	*6*	*18/498*	*4*	*18/88*	*20*
North West	*69/505*	*14*	*64/123*	*52*	*5/19*	*26*	*25/494*	*5*	*14/83*	*17*
Wales	*9/235*	*4*	*28/53*	*53*	*1/4*	*25*	*38/262*	*15*	*5/15*	*33*
Northern Ireland	*10/114*	*9*	*14/23*	*61*	*1/5*	*20*	*8/134*	*6*	*1/23*	*4*
Scotland	*14/211*	*7*	*21/65*	*32*	*0/9*	*0*	*19/254*	*7*	*1/36*	*3*
UK	***431/ 4153***	***10***	***542/ 1010***	***54***	***27/ 170***	***16***	***388/ 4766***	***8***	***129/ 737***	***18***

COMMENT:

- 10% of conservatively treated invasive cancers and 54% of conservatively treated non-invasive cancers did not receive radiotherapy. This difference probably arises because the potential benefits of radiotherapy for women with conservatively treated non-invasive breast cancer have only recently been reported. The proportion of conservatively treated invasive cancers not receiving radiotherapy varied from 4% in Wales to 12% in London and 14% in North West. Regional differences were more marked for non-invasive cancers, with the proportions not receiving radiotherapy varying from 33% in Northern and 32% in Scotland to 64% in South East (West) and 66% in South East (East).
- 16% of ER negative, node positive invasive cancers and 54% of ER negative, node negative invasive cancers did not receive chemotherapy. The latter varied from 27% in Northern Ireland to 84% in London. It would be interesting to examine the grade of the ER negative, node negative tumours to see if this was a factor influencing the decision to give chemotherapy to these women.
- 7% of invasive cancers and 62% of non-invasive cancers had unknown ER status. The former varied from 1% in Northern Ireland and Scotland to 22% in Northern and 23% in Wales and the latter from 32% in Northern to 98% in Wales. Given the importance of ER status in determining management decisions, regional QA reference centres and regional QA surgeons should actively encourage their screening units to obtain this information.
- 6% of ER positive, invasive cancers did not receive hormonal therapy. In London, Wales, Northern and Trent between 12% and 17% of women with ER positive invasive tumours did not receive hormonal therapy. Given the proven benefits of hormone treatment for women with ER positive cancers, regional QA reference centres and regional QA surgeons should audit these cases to ascertain the reasons why hormone therapy was not prescribed.
- 18% of ER negative cancers received hormonal therapy, varying between 2% in Trent and 33% in Wales. Given the emerging data concerning the possible complications associated with the use of Tamoxifen, regional QA reference centres and regional QA surgeons should encourage their screening units to carefully review their policies relating to the prescribing of Tamoxifen to women with ER negative tumours.

7. SURVIVAL ANALYSIS

Detailed tables giving full analysis of results are provided in Appendix 7 starting on p.136

UK NHS Breast Screening Programme data for women with breast cancer detected by screening between 1st April 1996 and 31st March 1997 were combined with data recorded by regional cancer registries to enable analysis of breast cancer survival. For the first time, data from Scotland were available and survival analysis includes the whole of the UK NHSBSP.

The study end date was set at 31st March 2002 in order to record survival for a period of 5 years post diagnosis. All QA Reference Centres apart from Scotland had complete follow-up beyond the study end date. In Scotland death data were complete to 30th June 2001, whereafter all cases still alive were considered to be lost to follow up.

Where age at diagnosis, tumour size, grade and nodal status were available, the survival profiles according to these characteristics were examined. Data completeness has improved year on year. Size, grade and nodal status were recorded for 77% of the 5445 invasive cases. This allowed survival by NPI Group to be calculated.

7.1 Survival Analysis Methods

7.1.1 Relative Survival Analysis

Relative survival is defined as the observed survival in the patient group divided by the expected survival of the general population. The cumulative relative survival is interpreted as the proportion surviving a given interval after diagnosis in the hypothetical situation that breast cancer is the only possible cause of death. A population without breast cancer would have a relative survival rate of 100%.

Relative survival was calculated, using the statistical package Surv2. The main advantage of calculating relative rather than cause-specific survival is that knowledge of the cause of death is not required. Expected survival probabilities for women in the general UK population were calculated using the Hakulinen method with probability of life tables supplied by the Government's Actuary Department.

For each relative survival rate, 95% confidence intervals are approximated as twice the standard error. Relative survival curves are tested for statistically significant differences using the proportional hazards alternative hypothesis. Full details can be found in the Surv2 software manual.

7.2 Eligibility of Cases for the Survival Study

Details of 7221 breast cancers were submitted to the West Midlands Cancer Intelligence Unit for the survival audit. Of these, 6757 cases were eligible to be included in the survival analysis. Cases were excluded if the following applied:

- Unknown invasive status (168 cases)
- Case not registered at the regional cancer registry (219 cases)
- Below 45 at diagnosis (35 cases)
- Above 75 at diagnosis (42 cases)

Overall, 5445 invasive cancers, 150 micro-invasive cancers and 1162 non-invasive cancers were eligible for the survival analysis (Tables 110 to 114).

7.3 Non-registered Cases

Figure 52 shows that 219 (3.0%) of the 7221 breast cancers detected in 1996/97 were not registered at the local cancer registry. The region with the highest number of non-registered cases (Northern, 59 cases) is working with its local cancer registry to register these cases using data from the UK NHSBSP. This highlights that in many regions the BASO breast audit promotes effective data exchange between the NHSBSP and cancer registries. Wales and Scotland record death data separately on their own databases so do not request these data from their cancer registries.

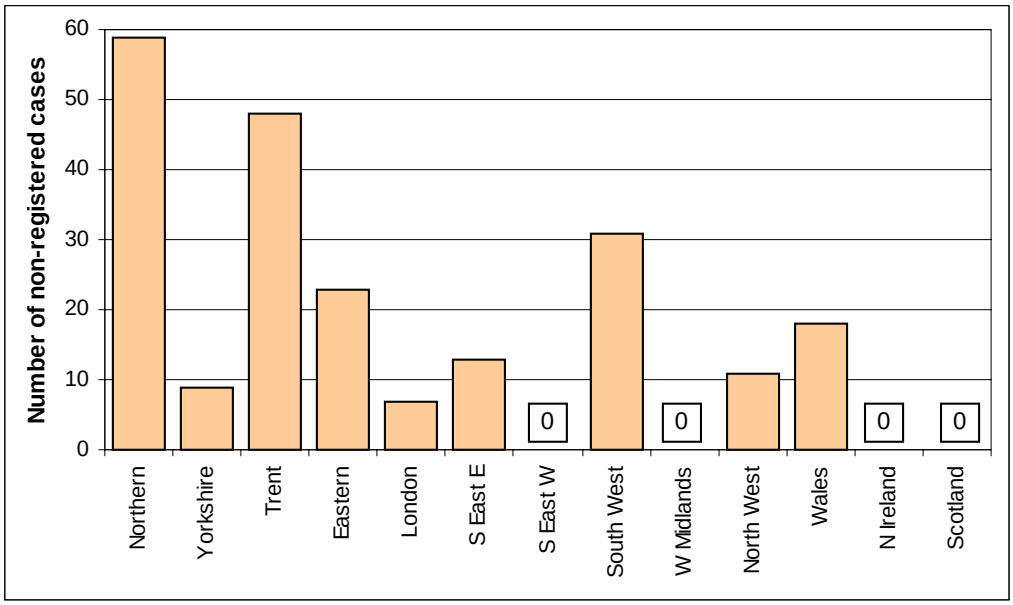

Figure 52 (Table 111) : Variation in the number of screen detected cancers not registered by the regional cancer registry

7.4 Data Quality and Characteristics of Cases Included in the Analysis

Age at diagnosis was available for all cases in the survival analysis. The age profile for all eligible cancers is shown in Table 115, and by invasive status in Tables 116 to 118.

The distribution of size, grade and nodal status of invasive cancers is shown by region in Tables 119 to 121.

The data quality for invasive cancers in the BASO survival analysis is compared over 5 years in the following table. Data completeness has improved year on year. In particular, the proportion of cases with unknown grade has fallen from 21% to 5% and the proportion with unknown nodal status has fallen from 42% to 18%.

5 YEAR COMPARISON OF DATA QUALITY					
Category	***Year of diagnosis***				
	1992/93	***1993/94***	***1994/95***	***1995/96***	***1996/97***
	%	***%***	***%***	***%***	***%***
Unknown Size	*7*	*5*	*4*	*2*	*2*
1-9 mm	20	22	23	23	24
10-19 mm	46	48	49	50	51
20-49 mm	25	23	23	24	22
50+ mm	2	2	1	1	2
Unknown Grade	*21*	*19*	*15*	*11*	*5*
Not Assessable Grade	-	-	-	-	1
Grade I	28	28	30	32	34
Grade II	38	38	39	41	43
Grade III	13	14	16	16	17
Unknown Nodal Status	*42*	*38*	*31*	*28*	*18*
Node Positive	18	19	20	20	24
Node Negative	40	43	49	52	58

The variation in data quality by region for invasive cancers diagnosed in 1996/97 is summarised in Table 123. The proportion of cases with size unknown was low in all regions and varied from 0% in West Midlands, Wales and Scotland to 4% in Yorkshire and North West. The proportion of cases with unknown grade varied from 1% in Trent and Scotland to 11% in Eastern and 12% in North West. Nodal status was unknown for 18% of invasive cancers, varying from 1% in Wales and 4% in Scotland to 26% in South West and 45% in North West.

In 1996/97 size, grade and nodal status were recorded for 77% of the 5445 invasive cases. This allowed the NPI score to be calculated.

NPI Score= 0.2 x Invasive Size (cm) + Grade + Nodes

where Nodes equals 1 (0 positive nodes), 2 (1, 2 or 3 positive nodes) or 3 ($\geq$4 positive nodes)

EPG	(Excellent Prognostic Group)	$\leq$2.4
GPG	(Good Prognostic Group)	2.401-3.4
MPG1	(Moderate Prognostic Group 1)	3.401-4.4
MPG2	(Moderate Prognostic Group 2)	4.401-5.4
PPG	(Poor Prognostic Group)	>5.4

Of the 5445 invasive cancers eligible for the survival analysis, the NPI score of 1086 (20%) fell in the excellent prognostic group (EPG), 1399 (26%) GPG, 926 (17%) MPG1, 518 (10%) MPG2 and 266 (5%) in the poor prognostic group (PPG). An NPI score was unknown for 1250 cancers (23%). The regional variation in NPI is shown in Figure 53.

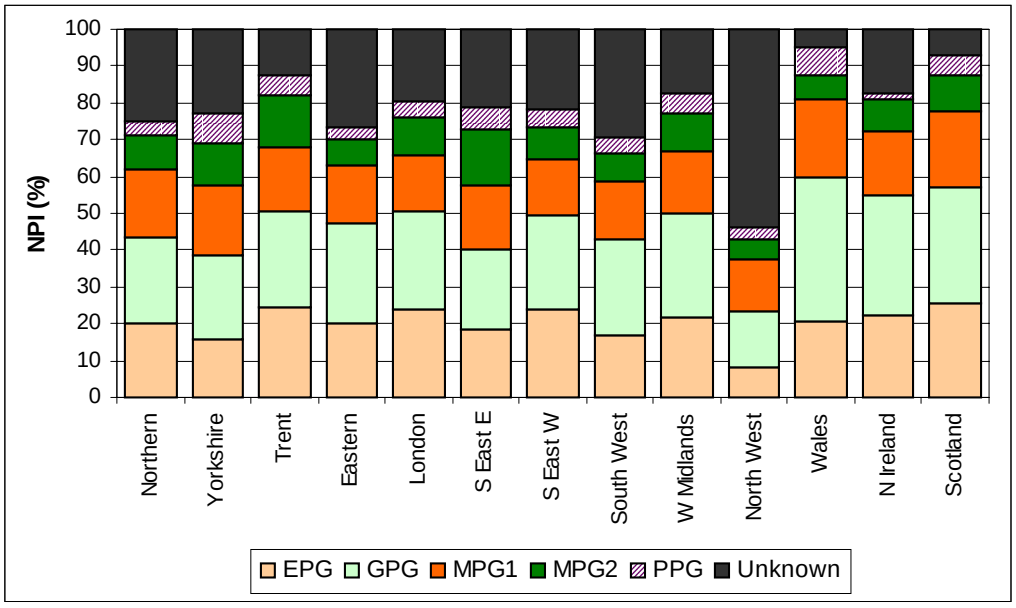

Figure 53 (Table 122) : Variation in the NPI score of screen detected cancers diagnosed in 1996/97

The proportion of cases with NPI score unknown varied between 5% in Wales and 7% in Scotland to 54% in North West (Table 123). The failure to record nodal status for 45% of invasive cancers was the main reason for the lack of NPI score in the North West.

7.5 Relative Survival Rates

7.5.1 Relative Survival Rates of Invasive Cancers by Region

The overall 5 year relative survival for women diagnosed with invasive screen detected breast cancers in the UK in 1996/97 was 95.4% (95% CI 94.6 - 96.2). Figure 54 shows variation by region in 5 year relative survival rates. No region had a significantly worse 5 year survival than the UK as a whole, although there were statistical differences between the survival curves for each region (p=0.004). Northern Ireland (100.1%) and Yorkshire (99.5%) had significantly higher 5 year relative survival than screen detected breast cancer patients in the UK as a whole. The relative survival curve for Yorkshire is significantly different to the curve for the UK as a whole (p=0.012).

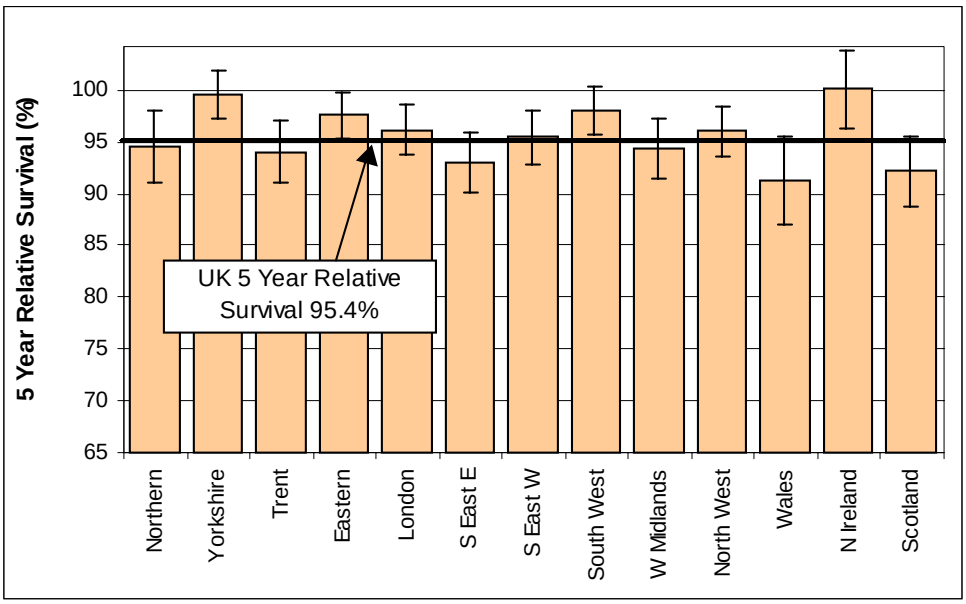

Figure 54 (Table 124) : Variation in 5 year relative survival for women with screen detected invasive breast cancer diagnosed in 1996/97

7.5.2 Relative Survival of Invasive Cancers by Age Group

Table 125 shows the variation in relative survival rates of women with invasive cancer by age at diagnosis. 5 year relative survival was lowest in women aged 55-59 (93.7% CI 92.1- 95.3) but this difference was not statistically significant.

7.5.3 Relative Survival of Invasive Cancers by Tumour Size

Table 126 shows how relative survival rates varied with tumour size at diagnosis. The 5 year relative survival of women with 1-9mm invasive tumours was 97.5% (95% CI 96.1%-98.9%) and for those with 10-19mm invasive tumours was 97.2% (95% CI 96.2%-98.2%). Most screen detected invasive cancers (74%) fell into one of these two size bands with good survival. Only 2% of screen detected invasive cancers measured 50mm or more. The 5 year relative survival for these large cancers was 82.4% (95% CI 72.8%-91.9%). There were clear statistical differences between the relative survival curves stratified by invasive size ($p<0.0005$). In particular, relative survival for patients with <20mm tumours was significantly different to relative survival for patients with 20+mm tumours ($p<0.0005$). The relative survival curve for the 91 (2%) women with cancers of unknown size was not significantly different to the relative survival curve for 20-49mm tumours ($p=0.868$). This suggests that the majority of the cancers with unknown were within the 20-49mm size range.

7.5.4 Relative Survival of Invasive Cancers by Tumour Grade

As expected for screen detected invasive breast cancers, the majority (77%) were Grade I or Grade II tumours (Table 120). Table 127 shows how relative survival rates varied with tumour grade at diagnosis. 5 years after diagnosis, the relative survival of women with Grade I tumours was 99.7% (95% CI 98.7%-100.7%), compared with 86.5% (95% CI 83.9%-89.1%) in those with Grade III tumours. There was a statistical difference between the relative survival curves stratified by grade ($p<0.0005$). The relative survival of the 288 (5%) women with unknown grade was 96.5% (95% CI 93.5%-99.6%). This was very similar to that for the 43% of women with Grade II tumours which was 95.3% (95% CI 94.1%-96.5%).

7.5.5 Relative Survival of Invasive Cancers by Nodal Status

Although the number of invasive cancers with nodal status unknown fell from 42% in 1992/93 to 18% in 1996/97 this is still much higher than the 7% with nodal status unknown in the main audit of cases diagnosed in 2001/02. 58% of invasive cancers diagnosed in 1996/97 had negative nodal status and 24% had positive nodal status (Table 121), giving a ratio of node negative to node positive tumours for those cancers with nodal status known of 71:29.

Table 128 shows how relative survival rates varied with nodal status at diagnosis. The 5 year relative survival rate of women with negative nodes was 98.0% (95% CI 97.1%-98.9%), compared with only 87.7% (95% CI 85.5%-89.8%) in those with positive nodes. There were clear statistical differences in relative survival curves stratified by nodal status ($p<0.0005$). In particular node positive tumours had significantly worse relative survival compared with node negative tumours ($p<0.005$)

Women with tumours of unknown nodal status had a 5 year relative survival rate of 97.1% (95% CI 95.4%-98.8%), slightly lower than those with negative nodes. Tumours with nodal status unknown did not have significantly different survival to tumours with negative nodal status ($p=0.484$) but did have significantly different survival to tumours with positive nodal status ($p<0.0005$). This is consistent with the interpretation that a large proportion of tumours

with unknown nodal status were actually node negative and may not have been recorded as such because histopathology reports for negative nodes have not been identified routinely for transmission to screening unit offices.

7.5.6 Relative Survival of Invasive Cancers by NPI Group

Figure 55 shows how relative survival rates varied with NPI score at diagnosis. The 5 year relative survival rate for tumours in the excellent prognostic group (EPG) was 100.5% (95% CI 99.3%-101.7%), compared with only 71.5% (95% CI 65.5%-77.5%) for those in the poor prognostic group (PPG). There were statistical differences between the survival curves stratified by NPI ($p<0.0005$). It is interesting to note that the relative survival curve for cases with unknown NPI lies between the curves for good prognostic group (GPG) and moderate prognostic group 1 (MPG1) tumours.

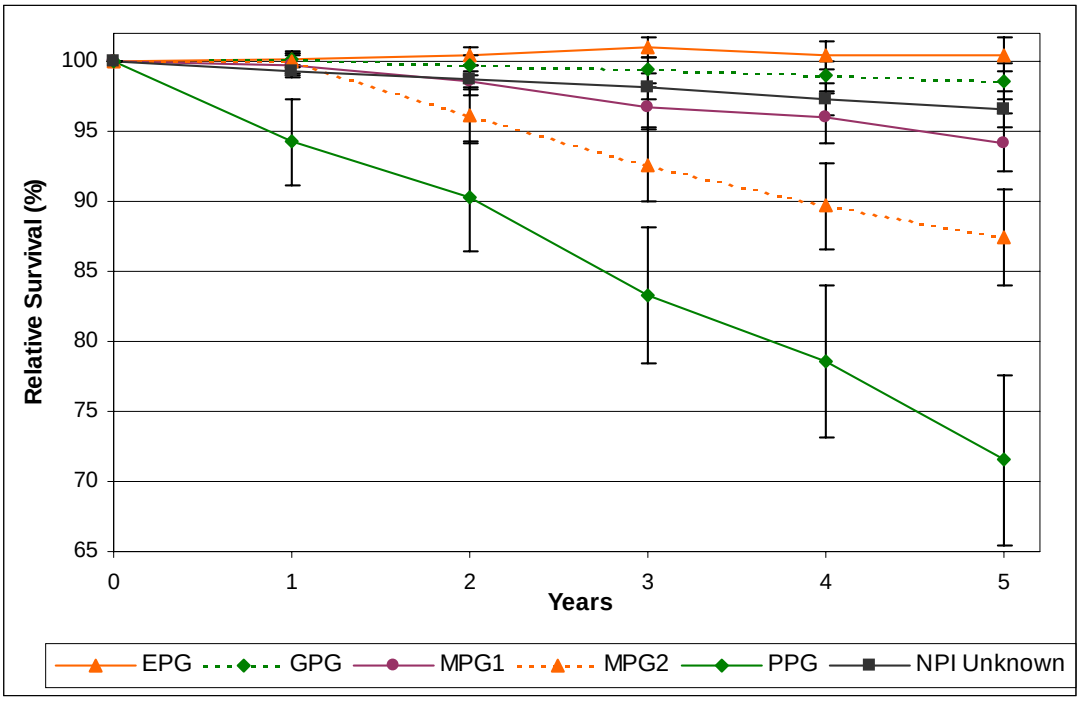

Figure 55 (Table 129) : Variation in 5 year relative survival by NPI for women with screen detected invasive breast cancer diagnosed in 1996/97

7.5.7 Summary of Relative Survival Rates for Invasive Cancers

The overall 5 year relative survival for women with invasive screen detected breast cancer was 95.4% (95% CI 94.6%-96.2%). There was no significant difference between the survival curves for women in different age groups at diagnosis. Figure 56 summarises how 5 year relative survival varied with tumour size, grade, nodal status and NPI. The highest relative survival rates were seen in women with small 1-9mm tumours, grade I tumours and tumours with negative nodes. Overall, tumours in the excellent prognostic group (EPG) had the highest 5 year relative survival rate (100.5% (95% CI 99.3%-101.7%). By definition, all EPG tumours are node negative, Grade I and have diameter $\leq$20mm. These are the types of tumours that the screening programme endeavours to detect. In 1996/97 26% of tumours with known NPI status fell into this prognostic group.

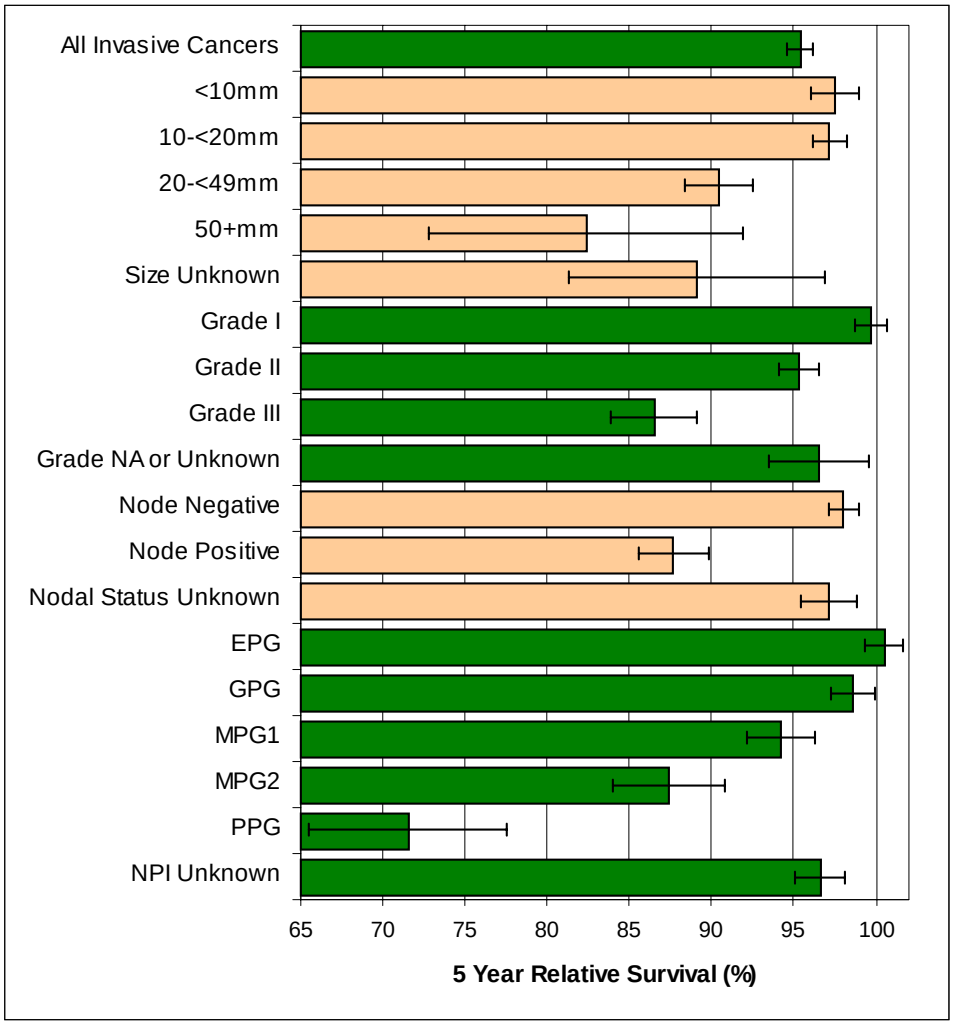

Figure 56 (Tables 126-129) : Effect of size, grade, nodal status and NPI on 5 year relative survival for women with invasive cancers diagnosed in 1996/97

7.6 Relative Survival Rates for Invasive, Micro-invasive and Non-invasive Cancers

The 5 year relative survival for the 5445 invasive cancers screen detected in 1996/97 was 95.4% (95% CI 94.6%-96.2%). Both micro-invasive and non-invasive cancers had significantly better 5 year survival than invasive cancers (Table 130). For the 150 micro-invasive cancers the 5 year relative survival was 101.7 (95% CI 99.3%-104.0%). The 5 year relative survival for the 1162 non-invasive cancers was 100.5% (95% CI 99.4%-101.6%).

Overall in the UK, there were 41 deaths amongst women diagnosed with micro-invasive or non-invasive breast cancer. 3 of the deaths were in women with micro-invasive tumours and 38 in those with non-invasive tumours. Whilst a small number of non-cancer deaths would be expected in these women, regional QA reference centres, regional QA surgeons and regional cancer registries should audit the deaths in these women to ensure that the details of these tumours and the causes of death of the women have been recorded correctly. In particular checks should be carried to ensure that, where women have been recorded by cancer registries as having multiple breast tumours and where the cause of death was breast cancer, that the correct cause of death has been recorded for both tumours.

COMMENT:

- The overall 5 year relative survival for invasive screen detected breast cancers diagnosed between 1st April 1996 and 31st March 1997 was 95.4% (95% CI 94.6% - 96.2%).
- A clear relationship between survival and tumour size, grade and nodal status was apparent with the highest relative survival rates being seen in women with small 1-9mm tumours, Grade I tumours and tumours with negative nodes.
- Overall, invasive tumours in the excellent prognostic group (EPG) had the highest 5 year relative survival rate (100.5% (95% CI 99.3%-101.7%). By definition, all EPG tumours are node negative, Grade I and have diameter $\leq$20mm. These are the types of tumours that the screening programme endeavours to detect. In 1996/97 26% of tumours with known NPI status fell into this prognostic group.
- Overall in the UK, there were 41 deaths amongst women diagnosed with micro-invasive or non-invasive breast cancer. Whilst a small number of non-cancer deaths would be expected in these women, regional QA reference centres, regional QA surgeons and regional cancer registries should audit the deaths in these women to ensure that the details of these tumours and the causes of death of the women have been recorded correctly.

APPENDIX 1

BASO BREAST AUDIT FOR SCREEN DETECTED BREAST CANCERS WITH DATE OF FIRST OFFERED APPOINTMENT BETWEEN 1ST APRIL 2001 - 31ST MARCH 2002

TIMETABLE OF EVENTS

Date	Event
15th May 2002	Format of the new style BASO audit discussed at QARC Training Session
16th May – 24th May 2002	QA Co-ordinators to discuss changes with their regional QA Surgeon and QA Director.
27th May 2002	Deadline for responses from regions regarding the proposed changes to audit.
10th June 2002	Instructions, definitions and questionnaires sent to QA Surgeons, QA Directors and QA Co-ordinators. QA Co-ordinators liaise with lead surgeons and screening office managers on methods used to collect data.
16th August 2002	Deadline for receipt of Adjuvant Therapy data at regional QARCs. QARCs validate data and collate regional data into spreadsheet provided.
9th August 2002	Deadline for survival information to be submitted to regional QARCs.
23rd August 2002	Regional QARCs to submit survival details to the relevant cancer registry for matching and death information
16th September 2002	Validated Adjuvant Therapy section to be submitted to the WMCIU
23rd September 2002	Cancer Registry to inform the appropriate QARC of death information for the submitted survival cases
4th October 2002	Validated Survival data to be submitted to the WMCIU
2nd December 2002	Deadline for audit data to be at regional QARCs **with the signature of lead breast surgeon to confirm that the data are correct**. QARCs validate unit level data and collate regional data into the spreadsheets provided.
3rd January 2003	Deadline for receipt of all regional and unit level data from QARCs at the West Midlands Cancer Intelligence Unit. WMCIU inputs data into national databases and liaises with QARCs to ensure data are complete and correct.
6th January – 10th January 2003	All QA Reference Centres to ensure that an appropriate member of staff is available to respond to any queries from the WMCIU.
7th February 2003	Draft booklet sent to the BASO Audit Group to act as scrutinisers/editors to:- Pick up typographical or numerical errors and alert QARC to any potential failures in relation to QA standards. NB: It will not be possible to incorporate new or late data at this stage.
14th February 2003	BASO Audit Group meet to discuss final draft.
28th February 2003	Deadline for receipt of national booklet at the printers.
5th March 2003	Advance copies of booklet to be taken to the Regional QA Surgical Co-ordinators National 'Big 18' meeting
10th March – 14th March 2003	Advance copies of booklet to be sent to speakers, QA Directors and QA Co-ordinators for information only. Questions to be sent to QA Co-ordinators and Regional QA Surgical Co-ordinators to allow presentation preparation.
2nd April 2003	2003 BASO Breast Group Meeting at the Motorcycle Museum.

APPENDIX 2

2001/02 VERSION

BASO BREAST AUDIT QUESTIONNAIRE COMBINED WITH GUIDANCE NOTES AND DATA CHECKS

PLEASE SUPPLY DATA FOR WOMEN OF ALL AGES WITH SCREEN DETECTED BREAST CANCER WITH FIRST OFFERED APPOINTMENT FROM 1ST APRIL 2001 - 31ST MARCH 2002 INCLUSIVE ACCORDING TO THE REGIONAL BOUNDARIES EXTANT FROM 1ST APRIL 2002

This document accompanies the MS Excel spreadsheet designed to record BASO breast audit main surgical data and screening surgical caseload data which has been prepared by the West Midlands Cancer Intelligence Unit.

It is the responsibility of the QA Co-ordinator to organise collection at unit level, on paper and/or using copies of the spreadsheet. Regional data should then be sent to the West Midlands Cancer Intelligence Unit on the accompanying spreadsheet for collation of national data. A number of data quality checks have been included in the questionnaire to assist those supplying and collating data. These should be checked before submitting the data. **Please do not delete any rows, columns or tables in the spreadsheet.**

Each unit should be identified with a distinct code such as "Unit 1", "Unit 2" etc. These codes should match those used in the adjuvant therapy audit. Data will be presented by region and unit (with only the region identified). Each surgeon should be identified by their GMC code in order to audit screening caseload accurately. The unique identifying number known as the "Sx" number is required for data validation and matching purposes. **Names, dates of birth and other identifiable data should not be sent to the WMCIU**.

The deadline for submission of regional data by the regional QA Co-ordinator to the WMCIU is 3rd January 2003

****

UNIT:

REGION:

****

SURGICAL CONFIRMATION

I confirm that these data are an accurate record for the above unit

Signed (Lead Surgeon):

Print name:

Date:

DEFINITIONS AND GUIDANCE NOTES

Bilateral and multiple cancers*:* The KC62 report only counts one cancer per woman. Cancers included in the BASO breast audit should be counted in the same way so that the total number of cancers in the BASO breast audit equals the total number of cancers counted on the KC62 report for 2000/01. If bilateral or multiple cancers have been detected the KC62 software selects the larger cancer. If a non-invasive and an invasive tumour have been detected the KC62 report counts the invasive tumour only. The same rules should be applied for this audit.

Diagnosis on radiological and/or clinical grounds only: Cancers diagnosed with neither C5 nor B5 nor malignant diagnostic open biopsy should not be included this audit. Enter the total number of such cancers in the preliminary data table.

Pre-operative diagnosis for cancers: NHSBSP policy defines pre-operative diagnosis as diagnosis by C5 cytology and/or B5 core biopsy only. These cancers appear in KC62 C18 L24.

Malignant diagnostic open biopsies: Cancers diagnosed by neither C5 nor B5 will have had a diagnostic open biopsy with outcome of cancer. These cancers appear in KC62 C24 L24, which includes some cancers with events which were both diagnostic and therapeutic.

Cytology and Core biopsy: The following codes are used on the NHSBSP pathology reporting forms

Cytology reporting	**Core biopsy reporting**
C1=Unsatisfactory	B1=Unsatisfactory/Normal tissue only
C2=Benign	B2=Benign
C3=Atypia probably benign	B3=Benign but of uncertain malignant potential
C4=Suspicious of malignancy	B4=Suspicious of malignancy
C5=Malignant	B5A=Non-invasive cancer
	B5B=Invasive cancer
	B5C=Cancer of not assessable invasive status

If cytology was carried out please indicate the highest (worst) cytology result in the “worst cytology” column e.g. if a C2 and a C3 were obtained enter C3. If no cytology was carried out enter NONE in the “worst cytology” column

If core biopsy was carried out please indicate the highest (worst) core biopsy result in the “worst core biopsy” column e.g. if a B1 and a B5A result were obtained enter B5A. If no core biopsy was carried out enter NONE in the “worst core biopsy” column.

If a B5 result was obtained but the malignancy type (B5A, B5B or B5C) is unknown enter B5U in the “worst core biopsy” column

Screening surgical caseload: To each cancer in Part A assign the GMC code of the consultant surgeon. Women with no GMC code assigned (e.g. because the woman refused treatment) should be recorded as having no surgery in the surgical caseload audit. If the woman was under the care of more than one consultant surgeon for her diagnostic and therapeutic surgery enter GMC codes for each of the surgeons in Part A (separated by semicolons) and count the woman in the caseloads for each surgeon in the surgical caseload audit. By assigning a GMC code to each cancer in Part A each consultant surgeon can be credited with their total UK NHSBSP screening caseload.

Reasons for low caseload: An explanation is required for surgeons who have screening caseload <10 in 2000/01. Explanations given at unit level may become redundant when caseloads are collated at regional and then at national level.

First surgery date: The first surgery date given should be the first overall, whether this surgery was diagnostic or therapeutic.

Reconstruction surgery: Surgery which is only for the purpose of reconstruction should be excluded when calculating the date of final surgery and the total number of therapeutic operations.

Surgery for benign conditions: Surgery for benign conditions should be excluded when calculating the total number of therapeutic operations.

Diagnostic open biopsy was treatment: If the diagnostic open biopsy was treatment, and was the only operation, then the total number of therapeutic operations is zero.

Nodal Status: Nodal status refers to **axillary lymph nodes only.** If the number of positive nodes, the number of negative nodes or the number of nodes with unknown status are unknown then it will be assumed that the total number of nodes taken is unknown. If the total number of nodes taken is unknown then it will be assumed that status is unknown. Units are encouraged to ensure that the nodal data are as complete as possible.

Sentinel node biopsy: In some regions a small number of invasive cancers with less than 4 nodes taken may have undergone sentinel node assessment. Please identify all such cancers undergoing sentinel node procedures in Part A.

Lobular carcinoma in situ (LCIS): All women with non-invasive cancer, including those with LCIS, should be included in Part C of the audit. It is accepted that for LCIS the grade, disease extent and size are not assessable.

DATA CHECKS AND WARNINGS

References to the new KC62 Table T column and line numbers are given for information. Letters in curly brackets refer to columns in the main Excel sheet.

Check 1 The total number of cancers should equal KC62 C25 L36 and be equal to the number of invasive cancers (KC62 C35 L36) plus the number of micro-invasive cancers (KC62 C28 L36) plus the number of non-invasive cancers (KC62 C27 L36) plus the number of cancers with invasive status unknown (KC62 C26 L36).

i.e. In {Q} all cancers should be given code "I" (invasive), "M" (micro-invasive), "N" (non-invasive) or "U" (unknown) to match

KC62 C25 L36 = KC62 C35 L36+KC62 C28 L36+KC62 C27 L36+KC62 C26 L36.

Check 2 We assume that any cancer with neither B5 nor C5 was diagnosed by malignant diagnostic open biopsy. The number of pre-operative diagnoses (B5 and/or C5) should match KC62 C18 L24. The number of malignant diagnostic open biopsies should match KC62 C24 L24.

Check 3 If the total number of nodes is known then this number should equal the number of positive nodes plus the number of negative nodes plus the number of nodes with status unknown.

i.e. {L} ={M} + {N} + {O} provided {L} is not "U" (Unknown)

Check 4 The invasive size of tumour should be less than or equal to the whole size.

i.e. {T}$\leq${U} provided {T} and {U} are not "U" (Unknown)

Check 5 In the screening surgical caseload audit, the total number of cancers should equal the total caseload plus the total number of women with no surgery minus the total number of women treated by two surgeons. This formula is different if any woman is treated by more than 2 surgeons.

The following warnings indicate where lack of data completeness may lead to an incorrect assumption being made about a case. Units are encouraged to ensure that data are as complete as possible.

Warning 1 If the total number of nodes is unknown then it will be assumed that nodal status is unknown, even if the number of positive nodes is greater than zero. **Please go back and check any such cases.**

Warning 2 If the whole size of tumour is unknown then it will be assumed that the invasive size is the whole size. **Please go back and check any such cases.**

Queries

Any queries about the BASO breast audit should be directed to

Dr Jackie Walton
QA Information Manager
West Midlands Cancer Intelligence Unit
Public Health Building
The University of Birmingham
Birmingham B15 2TT

Tel: 0121 414 7713
Fax: 0121 414 7714
e-mail: jackie.walton@wmciu.thenhs.com

BASO BREAST AUDIT QUESTIONNAIRE 2001/2002

PRELIMINARY DATA SHEET

Unit Name	Number of women screened (KC62 C3 L12)	Number of women with radiological/clinical diagnosis only (KC62 C13 L24)	Number benign diagnostic open biopsies (KC62 C22 L24 + KC62 C23 L24)	Unit participating in ALMANAC trial? (Y/N)

PART A: TO BE COMPLETED FOR ALL CANCERS (KC62 C25 L36)

GMC code (enter GMC code of the consultant surgeon or NS = No Surgery). If the woman was treated by more than one consultant surgeon enter all GMC codes, separated by semicolons.
Worst cytology (C5, C4, C3, C2, C1 or NONE) Worst core biopsy (B5A, B5B, B5C, B5U, B4, B3, B2, B1, NONE)
Type of treatment (C = Conservation surgery, M = Mastectomy, NS = No Surgery, U = Unknown)
Final operation type – ignoring reconstruction, enter the most appropriate from the following list
(WLE=Wide Local Excision, MX=Mastectomy, AX=Axillary surgery, WLE+AX, MX+AX, NS=No surgery, O=Other (please specify), U=Unknown)
Invasive Status (I = Invasive, M = Micro-invasive, N = Non-invasive, U = Unknown)

{C} **Sx Number**	*{D}* **Consultant GMC Code**	*{E}* **Date of first offered appt** *(dd/mm/yyyy)*	*{F}* **Worst cyt-ology** *(see above)*	*{G}* **Worst core biopsy** *(see above)*	*{H}* **Type of treat-ment** *(C,M,NS,U)*	*{I}* **Total number of therapeutic operations*** *(0 if NS or if diag was therapeutic, 1, 2,…or U)*	*{J,K}* **Final operation type*** *(see above)*	**Axillary Lymph Nodes**					*{Q}* **Invasive status** *(I,N,M,U)*
								{L} **Total obtained** *(0, 1, 2,… or U)*	*{M}* **Number positive** *(0, 1, 2,… or U)*	{N} **Number negative** *(0, 1, 2,… or U)*	*{O}* **Number unknown status** *(0, 1, 2,… or U)*	*{P}* **Sentinel procedure** *(invasive <4 obtained only)* *(Y,N,U)*	

*ignore reconstruction only

PART B: TO BE COMPLETED FOR INVASIVE CANCERS ONLY (KC62 C35 L36)

Invasive size (enter size in millimetres, U = Unknown)
Whole size (enter size in millimetres, U = Unknown). Whole size includes any surrounding DCIS.
Invasive grade (I, II, III, NA=Not assessable, U=Unknown)

{C} **Sx Number**	*{T}* **Invasive size of tumour**	*{U}* **Whole size of tumour** *(including surrounding DCIS)*	*{V}* **Invasive grade** (I,II,III, NA, U)

PART C: TO BE COMPLETED FOR NON-INVASIVE CANCERS ONLY (KC62 C27 L36)

Grade (H = High grade, O = Other grade, NA = Not assessable, U = Unknown)
Disease extent (L = Localised, M = Multiple, NA = Not assessable, U = Unknown)
Pathological size (enter size in millimetres, NA = Not assessable, U = Unknown)

{C} **Sx Number**	*{Y}* **Grade** (H,O,NA,U)	*{Z}* **Disease extent** (L,M,NA,U)	*{AA}* **Pathological size** (size (mm), NA,U)

SCREENING SURGICAL CASELOAD AUDIT

Please fill in Part A first.

Screening surgical caseload should be calculated by summing the number of times each GMC code appears in Part A.
Cases with no surgery (NS) should appear on the top line.
Cases treated by more than one surgeon should be counted in each surgeon’s caseload. The number of such cases is needed for Check 5.

GMC Code	**Screening caseload (from Part A)**	**If caseload <10 was this because............ (write Y in the first applicable reason)**								
		Other caseload > 30 per year	**Joined NHSBSP 2001/02**	**Left NHSBSP 2001/02**	**Surgeon operated on patient request**	**Surgeon is a plastic surgeon**	**Surgeon operated in private practice**	**Not screening in area 2001/02**	**No information available for surgeon**	**Other reason (text)**
NS										

APPENDIX 3

2001/02 VERSION

BASO BREAST AUDIT ADJUVANT THERAPY DATA FORM COMBINED WITH GUIDANCE NOTES

PLEASE SUPPLY DATA FOR WOMEN OF ALL AGES WITH SCREEN DETECTED BREAST CANCER WITH FIRST OFFERED APPOINTMENT FROM 1ST OCTOBER 2000 – 30TH SEPTEMBER 2001 INCLUSIVE ACCORDING TO THE REGIONAL BOUNDARIES EXTANT FROM 1ST APRIL 2002

This document accompanies the MS Excel spreadsheet designed to record BASO breast audit adjuvant therapy data which has been prepared by the West Midlands Cancer Intelligence Unit. The spreadsheet contains data validation checks.

The BASO breast audit group expects the consultant surgeon to collect adjuvant therapy data for the list of cases supplied by the screening office or regional QA Reference Centre. The QA Co-ordinator will organise collation of these data. A box is provided for the signature of the surgeons to verify that these data are correct.

Data will be presented by region and unit (with only the region identified). The unique identifying number known as the "Sx" number is required for data validation and matching purposes. **Names, dates of birth and other identifiable data should not be sent by the QA Co-ordinator to the WMCIU**.

The deadline for submission of regional data by the regional QA Co-ordinator to the WMCIU is 16th September 2002

DEFINITIONS AND GUIDANCE NOTES

Audit cut-off date: If a woman has not received radiotherapy or chemotherapy or hormonal therapy before 30th June 2002 then it should be assumed for the purposes of this audit that she has not had this treatment.

Bilateral and multiple cancers*:* The KC62 report only counts one cancer per woman. Cancers included in the BASO breast audit should be counted in the same way so that the number of cancers in the BASO breast audit equals the number counted on the KC62 report. If bilateral or multiple cancers have been detected the KC62 software selects the larger cancer. If a non-invasive and an invasive tumour have been detected the KC62 report counts the invasive tumour only. The same rules should be applied for this audit.

Diagnosis on radiological and/or clinical grounds only: Cancers diagnosed with neither C5 nor B5 nor malignant diagnostic open biopsy should not be included in this audit.

First surgery date: The first surgery date given should be the first overall, whether this surgery was diagnostic or therapeutic.

Reconstruction surgery: Surgery which is only for the purpose of reconstruction should be excluded when calculating the date of final surgery and the total number of therapeutic operations.

Surgery for benign conditions: Surgery for benign conditions should be excluded when calculating the dates of first and final surgery.

DATA CHECKS

Letters in curly brackets refer to columns in the accompanying Excel spreadsheet.

Check 1	The first assessment date should be before or on the same day as the first surgery date. **i.e. {E} ≤ {F}**
Check 2	The first surgery date should be before or on the same day as the final surgery date. **i.e. {F} ≤ {G}**
Checks 3,4,5	The first assessment date should be before or on the same day as the adjuvant therapy dates. **i.e. {E} ≤ {L} and {E} ≤ {M} and {E} ≤ {N}**
Checks 6,7,8,9	The first assessment date would usually be no more than a year before the final surgery date and the adjuvant therapy dates. **i.e. {G}-{E} ≤ 365 and {L}-{E} ≤ 365** **and {M}-{E} ≤ 365 and {N}-{E} ≤ 365**

Queries

Any queries about the BASO breast audit should be directed to

Dr Jackie Walton
QA Information Manager
West Midlands Cancer Intelligence Unit
Public Health Building
The University of Birmingham
Birmingham B15 2TT

Tel: 0121 414 7713
Fax: 0121 414 7714
e-mail: qarc@wmciu.thenhs.com

BASO ADJUVANT THERAPY AUDIT - TO BE COMPLETED FOR ALL CANCERS WITH DATE OF FIRST OFFERED APPOINTMENT FROM 1ST OCTOBER 2000 TO 30TH SEPTEMBER 2001 INCLUSIVE

Enter dates in dd/mm/yyyy format (e.g. 01/10/2000) or U=Unknown, NS=No surgery, NRT=No radiotherapy, NCT=No chemotherapy, NHT=No hormonal therapy
ER Status (P = Positive, N = Negative, U = Unknown) to be completed according to local definitions

{C} **Sx Number**	*{D}* **Date of first offered appointment** (dd/mm/yyyy)	*{E}* **First assessment date** (dd/mm/yyyy,U)	*{F}* **First surgery date** *(diagnostic or therapeutic)* (dd/mm/yyyy,NS,U)	*{G}* **Final surgery date** *(excl reconstruction only)* (dd/mm/yyyy,NS,U)

UNIT:

ADJUVANT THERAPY AUDIT - TO BE COMPLETED FOR ALL CANCERS WITH DATE OF FIRST OFFERED APPOINTMENT FROM 1ST OCTOBER 2000 TO 30TH SEPTEMBER 2001 INCLUSIVE

Enter dates in dd/mm/yyyy format (e.g. 01/10/2000) or U=Unknown, NS=No surgery, NRT=No radiotherapy, NCT=No chemotherapy, NHT=No hormonal therapy
ER Status (P = Positive, N = Negative, U = Unknown) to be completed according to local definitions

{C}	*{H}*	*{I}*	*{J}*	*{K}*	*{L}*	*{M}*	*{N}*	*{O}*
Sx Number	**Name**	**NHS Number**	**Hospital Number**	**Date of birth**	**Radiotherapy start date**	**Chemotherapy start date**	**Hormonal therapy start date**	**ER status**
	To aid data collection by the consultant surgeon. Do <u>not</u> send to WMCIU.				(dd/mm/yyyy, NRT,U)	(dd/mm/yyyy, NCT,U)	(dd/mm/yyyy, NHT,U)	(P,N,U)

I confirm the data above are correct and as complete as possible	**Signature (Surgeon):** **Print Name:** **Date:**

APPENDIX 4

2001/02 VERSION

BASO BREAST SURVIVAL AUDIT FOR WOMEN WITH SCREEN DETECTED BREAST CANCER DETECTED BETWEEN 1ST APRIL 1996 AND 31ST MARCH 1997

PROTOCOL

Aim:

To combine NHS Breast Screening Programme data for women with breast cancer detected by screening between 1st April 1996 – 31st March 1997 with data recorded by regional cancer registries to enable analysis of breast cancer survival for a period of up to 6 years post-diagnosis. Where tumour size, grade and nodal status are available the survival profiles according to prognostic characteristics will also be examined. The audit will continue to demonstrate effective information exchange between the NHS Breast Screening Programme and regional cancer registries.

Study population:

Women with a histologically confirmed breast cancer detected at screening with a screening date between 1st April 1996 and 31st March 1997 should be included in the study. Core patient and tumour data should be extracted from screening service computer systems and matched with records held by regional cancer registries. Cancer registration data should be used to identify women in this group who have died from breast cancer prior to the end of study censor date of 31st March 2002.

Identification of deaths from breast cancer:

Death certificates where cancer is mentioned either as a cause of death or as present at the time of death (cancer deaths) are forwarded routinely to cancer registries in England and Wales by the Registrar General. Death certificates are sent to the cancer registry (or registries) covering the geographical area(s) where the death was registered or in which the person normally resided. Cancer registries in England and Wales are also informed of non cancer deaths for cases they have sent to the National Cancer Intelligence Centre at the Office for National Statistics (ONS) via a passive follow up system involving the NHS Central Register (NHSCR) in Southport. The Northern Ireland Cancer Registry also receives cancer and non cancer death data in a similar way.

Death certificates for cancer deaths are sent within one or two weeks of death to the appropriate cancer registry (or registries). Cancer death data should therefore be readily available for all cases included in the survival study provided that the information has been extracted and entered onto cancer registry computer systems. Details of non cancer deaths from NHSCR have been provided to cancer registries for cases registered with the ONS for all incidence years in the audit period. The timeliness with which NHSCR data is entered onto the cancer registry databases may vary between cancer registries. A short questionnaire has thus been sent to Breast Screening QA Co-ordinators as a supplement to the survival audit protocol, in order to ascertain the position in each cancer registry to aid the data analysis process within the WMCIU. The questionnaire requests information regarding non cancer death data received passively from the NHSCR and the extent to which each registry has carried out its own active follow up of cases with incidence years between 1996 and 1997. The questionnaire also requests information on whether or not each registry records the cause of death on their database according to the convention required (breast cancer, other cancer, non cancer). The QA Co-ordinator should liaise with the contact at the cancer registry to answer these questions and the form should be returned to the WMCIU with the survival spreadsheet.

DATA TO BE COLLECTED FROM SCREENING SERVICES AND COLLATED BY QUALITY ASSURANCE REFERENCE CENTRES

A specialist spreadsheet in MS Excel has been designed by the West Midlands Cancer Intelligence Unit to record survival audit data. Copies of the spreadsheet have been provided to each regional Quality Assurance Reference Centre. A paper representation of the format used in the spreadsheet is provided and may be used as the basis of a data collection form.

Women with a histologically confirmed breast cancer detected at screening with a screening date between 1st April 1996 and 31st March 1997 should be included. For National Breast Screening System (NBSS) users this data can be obtained using a specialised co-writer report designed by Mrs Margot Wheaton. Copies of the co-writer report have been provided to each regional Quality Assurance Reference Centre.

For each woman the following data should be extracted from breast screening computer systems:

• Forename	for use within region only
• Surname	for use within region only
• NHS number	for use within region only
• Address	for use within region only
• Postcode	for use within region only
• Date of birth	(dd/mm/yyyy) necessary for age calculations
• Screening number (Sx number)	for checking data queries
• Date of diagnosis	(dd/mm/yyyy) date of histological diagnosis
• Invasive status	Invasive/Micro-Invasive/Non-Invasive/Unknown
For invasive cancers only:	
• Tumour size	size in mm, 'U' for unknown
• Tumour grade	Bloom & Richardson grade I, II, III, NA or 'U' for unknown
• Number of positive lymph nodes	total number, zero if node negative, 'U' if status unknown

An appropriate screening office code should be entered onto the spreadsheet to aid with checking queries. This code should not be the nationally allocated three character code, but does need to be distinct e.g. "Unit 1".

If the QA Reference Centre is served by more than one cancer registry a code should be applied to allow the registry to be identified at a later date should the need arise.

Data should be collated at each regional QA Reference Centre onto the specialised MS Excel spreadsheets provided by the West Midlands Cancer Intelligence Unit. **Please ensure that only the limited number of codes specified on the data sheet are used.** Each regional QA Reference Centre should be responsible for overseeing the compilation of a regional database made up of women from each screening service in the region. This regional database should be forwarded to the regional cancer registry for record matching and addition of death data.

Screening units should submit details of women to their QA Reference Centre by 9th August 2002. Details should be sent to the relevant Cancer Registry by 23rd August 2002. Overall responsibility for regional data collection will remain with the QA Co-ordinator.

DATA TO BE COLLECTED FROM REGIONAL CANCER REGISTRIES

Regional cancer registries will be asked by the appropriate QA Reference Centre to match women included in each regional database with data held on the cancer registration systems using name, date of birth, NHS number, postcode, address and date of histological diagnosis.

The following data items should be added to the spreadsheet at the cancer registry.

• Registration number	the unique registration number should be added. **For cases not registered indicate "not registered" (NR) on the data collection form in the appropriate column.**
• Date of death	dd/mm/yyyy (leave blank if no death)
• ICDM code	morphology code e.g. 85003
• Cause of death code (if available)	B= breast cancer, C = other cancer, N= non-cancer, U = unknown, X = Information not collected at cancer registry (leave blank if no death) e.g. if a woman died of lung cancer, the cause of death code would be 'O'
• Cause of death text	for cases where the cause of death was not breast cancer the actual cause of death should be entered e.g. for a lung cancer death the cause text should read 'lung'

The censor date for the study has been set at the **31st March 2002**.

There is also a supporting information questionnaire which needs to be completed, regarding the collection and entry of death data. This questionnaire should be sent back to the appropriate QA Reference Centre along with the collected data.

This information should be returned to the appropriate QA Reference Centre by 23rd September 2002.

DATA VALIDATION

A number of data checks have been incorporated into each of the spreadsheets. These are as follows:

- Column AB – this data check is concerned with the age at diagnosis. If dates have been entered in the incorrect format the error message #VALUE! will appear. If the age at diagnosis calculates as a negative this shows that the date of diagnosis has been entered as before the date of birth.
- Column AC – this data check is making sure that a valid invasive status has been entered. If an invasive status has not been entered a prompt will appear in this column.
- Column AD – this data check calculates that the date of death (where applicable) is after the date of diagnosis. If there is a problem with these dates an ERROR! message will appear.

It is the responsibility of the Breast Screening QA Co-ordinator to ensure that any data checks have been resolved. There should not be any blank cells, except in the cancer registry information where there has been no death or when the cancer was registered (i.e. no 'NR' code). Validated regional data should be sent to the WMCIU for compilation of a national database and for survival analysis. **Any spreadsheets sent to the WMCIU which have unresolved data checks will be returned to the appropriate QA Reference Centre for resolution.**

QUERIES

Any queries about the survival study should be directed to:

Miss Emma Wheeler
QA Information Officer
West Midlands Cancer Intelligence Unit
Public Health Building
The University of Birmingham
Birmingham
B15 2TT

Tel: 0121 414 7713
Fax: 0121 414 7714
e-mail: emma.wheeler@wmciu.thenhs.com

Completed regional spreadsheets and supporting information should be submitted to the West Midlands Cancer Intelligence Unit by 4th October 2002.

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BASO AUDIT OF SURVIVAL : FORMAT OF DATA COLLECTION SPREADSHEET

Screening Unit:

Coding: Invasive status (I = Invasive, M = Micro-invasive, N = Non-invasive, U = Unknown)
Tumour grade – Bloom & Richardson (I, II, III, NA = Not assessable or U = Unknown)
Number of positive lymph nodes (If nodes positive enter number, if nodes negative enter zero, if unknown enter 'U')

Data in the shaded area should NOT be sent to the West Midlands Cancer Intelligence Unit								**Unit code**	**Date of birth** dd/mm/yyyy	**Sx No.**	**Date of diagnosis** dd/mm/yyyy	**Invasive Status** See above	**Invasive tumours only – if not invasive enter 'X' for the following fields**		
Fore name	**Sur-Name**	**NHS No.**	**Address**				**Post code**						**Inv Size mm**	**Tumour grade** See above	**No. +ve Nodes** See above
			1	**2**	**3**	**4**									

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BASO AUDIT OF SURVIVAL : FORMAT OF DATA COLLECTION SPREADSHEET

Coding: Cause of death code (B = Breast cancer, C = Other cancer, N = Non-cancer, U = Unknown, X = Information not collected at cancer registry) e.g. a woman who died from lung cancer should be coded as 'O'
ICDM code – morphology code should be entered e.g. 85003
Actual cause of death text - for non breast cancer deaths, the actual cause of death should be entered e.g. for a woman who died from lung cancer the cause text should read 'lung'

Cancer Registry Data							
Sx No.	**Cancer Registry Code**	**Reg No.**	**Not Regis-tered (NR)**	**Date of Death** dd/mm/yyyy	**ICDM code (morphology)**	**Cause of death code** See above	**Cause of death text**

ADDITIONAL SUPPORTING INFORMATION REQUIRED IN RELATION TO THE BASO STUDY OF SURVIVAL FOR SCREEN DETECTED BREAST CANCERS

Breast Screening QA Co-ordinators: Please liaise with all of the cancer registries you have contacted to obtain the following information and send the completed form(s) to the West Midlands Cancer Intelligence Unit with the completed survival spreadsheet.

****

Region:
Breast Screening QA Co-ordinator:

Which cancer registries cover the breast screening catchment areas included in your QA Reference Centre's remit?

For each cancer registry please ask your contact to complete the following:

Registry: _____

Contact name: _____

Name of each Breast Screening Services covered:

Have NHSCR follow up data been received by the cancer registry for:

1996 incident cases Yes/No
1997 incident cases Yes/No

Have NHSCR follow up data been entered onto the cancer registry system for:

1996 incident cases Yes/No
1997 incident cases Yes/No

Is cause of death recorded on the cancer registry system? Yes/No

If No, have death certificates been checked manually for cause of death for:

1996 incident cases Yes/No
1997 incident cases Yes/No

Is active follow up carried out? Yes/No

If Yes, has active follow up been carried out for:

1996 incident cases Yes/No
1997 incident cases Yes/No

This form should be returned to the relevant QA Co-ordinator along with all information collected.

APPENDIX 5

DATA FROM THE 2001/02 AUDIT OF SCREEN DETECTED BREAST CANCERS IN WOMEN OF ALL AGES FOR THE PERIOD 1ST APRIL 2001 – 31ST MARCH 2002

Table 1 : Number and invasive status of screen detected breast cancers and total women screened

Region	Invasive		Micro-invasive		Non-invasive		Status unknown		Total		Total women screened	Non-invasive cancer rate	Invasive cancer rate
	No	%	No	%	No	%	No	%	No	%			
Northern	357	79	6	1	85	19	4	1	452	100	77234	1.2	4.6
Yorkshire	496	75	2	0	157	24	5	1	660	100	100705	1.6	4.9
Trent	678	77	11	1	187	21	5	1	881	100	129672	1.5	5.2
Eastern	807	76	10	1	223	21	15	1	1055	100	143527	1.6	5.6
London	677	76	6	1	197	22	10	1	890	100	138363	1.5	4.9
South East (East)	644	76	16	2	188	22	2	0	850	100	119182	1.7	5.4
South East (West)	629	79	3	0	164	21	3	0	799	100	125394	1.3	5.0
South West	715	76	13	1	201	21	8	1	937	100	130187	1.6	5.5
West Midlands	673	80	5	1	161	19	2	0	841	100	140616	1.2	4.8
North West	923	79	19	2	225	19	3	0	1170	100	172191	1.4	5.4
Wales	483	79	9	1	114	19	3	0	609	100	72753	1.7	6.6
Northern Ireland	148	76	1	1	45	23	0	0	194	100	30434	1.5	4.9
Scotland	681	80	8	1	162	19	2	0	853	100	127729	1.3	5.3
United Kingdom	**7911**	**78**	**109**	**1**	**2109**	**21**	**62**	**1**	**10191**	**100**	**1507987**	**1.5**	**5.2**

Table 2 : Cancers diagnosed on radiological/clinical grounds only

Region	Total cancers including radiological/clinical cancers	Cancers diagnosed on radiological/clinical grounds only	
		No	%
Northern	452	0	0.00
Yorkshire	660	0	0.00
Trent	881	0	0.00
Eastern	1056	1	0.09
London	893	3	0.34
South East (East)	851	1	0.12
South East (West)	799	0	0.00
South West	937	0	0.00
West Midlands	842	1	0.12
North West	1170	0	0.00
Wales	609	0	0.00
Northern Ireland	194	0	0.00
Scotland	854	1	0.12
United Kingdom	**10198**	**7**	**0.07**

Table 3 : Pre-operative diagnosis rate									
Region	Total cancers	C5 only		C5 & B5		B5 only		Pre-operative diagnosis rate	
		No	%	No	%	No	%	No	%
Northern	452	188	42	48	11	145	32	381	84
Yorkshire	660	32	5	32	5	525	80	589	89
Trent	881	78	9	10	1	720	82	808	92
Eastern	1055	131	12	165	16	649	62	945	90
London	890	65	7	165	19	563	63	793	89
South East (East)	850	64	8	50	6	660	78	774	91
South East (West)	799	106	13	15	2	562	70	683	85
South West	937	108	12	17	2	715	76	840	90
West Midlands	841	80	10	30	4	649	77	759	90
North West	1170	234	20	42	4	733	63	1009	86
Wales	609	42	7	29	5	489	80	560	92
Northern Ireland	194	59	30	45	23	61	31	165	85
Scotland	853	162	19	299	35	276	32	737	86
United Kingdom	**10191**	**1349**	**13**	**947**	**9**	**6747**	**66**	**9043**	**89**

Table 4 : Pre-operative diagnosis rate (invasive cancers)									
Region	Total cancers	C5 only		C5 & B5		B5 only		Pre-operative diagnosis rate	
		No	%	No	%	No	%	No	%
Northern	357	170	48	38	11	111	31	319	89
Yorkshire	496	31	6	30	6	414	83	475	96
Trent	678	75	11	10	1	563	83	648	96
Eastern	807	119	15	139	17	501	62	759	94
London	677	53	8	135	20	443	65	631	93
South East (East)	644	61	9	45	7	508	79	614	95
South East (West)	629	100	16	15	2	457	73	572	91
South West	715	104	15	17	2	548	77	669	94
West Midlands	673	73	11	30	4	530	79	633	94
North West	923	225	24	42	5	560	61	827	90
Wales	483	35	7	29	6	396	82	460	95
Northern Ireland	148	53	36	37	25	48	32	138	93
Scotland	681	147	22	255	37	206	30	608	89
United Kingdom	**7911**	**1246**	**16**	**822**	**10**	**5285**	**67**	**7353**	**93**

Table 5 : Pre-operative diagnosis rate (non-invasive cancers)									
Region	Total cancers	C5 only		C5 & B5		B5 only		Pre-operative diagnosis rate	
		No	%	No	%	No	%	No	%
Northern	85	13	15	9	11	30	35	52	61
Yorkshire	157	1	1	1	1	108	69	110	70
Trent	187	3	2	0	0	143	76	146	78
Eastern	223	9	4	17	8	136	61	162	73
London	197	8	4	29	15	112	57	149	76
South East (East)	188	1	1	5	3	137	73	143	76
South East (West)	164	4	2	0	0	104	63	108	66
South West	201	4	2	0	0	148	74	152	76
West Midlands	161	5	3	0	0	114	71	119	74
North West	225	5	2	0	0	158	70	163	72
Wales	114	5	4	0	0	86	75	91	80
Northern Ireland	45	5	11	8	18	13	29	26	58
Scotland	162	13	8	40	25	66	41	119	73
United Kingdom	**2109**	**76**	**4**	**109**	**5**	**1355**	**64**	**1540**	**73**

Table 6 : Invasive status of the diagnostic core biopsy									
Region	Total	B5A (Non-invasive)		B5B (Invasive)		B5c (Not assessable)		Unknown	
		No	%	No	%	No	%	No	%
Northern	193	58	30	122	63	1	1	12	6
Yorkshire	557	141	25	405	73	0	0	11	2
Trent	730	190	26	536	73	4	1	0	0
Eastern	814	197	24	605	74	9	1	3	0
London	728	129	18	387	53	2	0	210	29
South East (East)	710	185	26	469	66	2	0	54	8
South East (West)	577	129	22	446	77	0	0	2	0
South West	732	185	25	535	73	4	1	8	1
West Midlands	679	156	23	519	76	3	0	1	0
North West	775	213	27	503	65	2	0	57	7
Wales	518	129	25	382	74	5	1	2	0
Northern Ireland	106	33	31	73	69	0	0	0	0
Scotland	575	136	24	423	74	0	0	16	3
United Kingdom	**7694**	**1881**	**24**	**5405**	**70**	**32**	**0**	**376**	**5**

Table 7 : B5a (Non-invasive) core biopsy: histological invasive status after surgery												
Region	Invasive		Micro-invasive		Non-invasive		No surgery		Unknown		Total	
	No	%	No	%	No	%	No	%	No	%	No	%
Northern	17	29	4	7	36	62	0	0	1	2	58	100
Yorkshire	32	23	1	1	105	74	1	1	2	1	141	100
Trent	44	23	9	5	137	72	0	0	0	0	190	100
Eastern	48	24	6	3	142	72	1	1	0	0	197	100
London	45	35	4	3	76	59	4	3	0	0	129	100
South East (East)	48	26	8	4	125	68	4	2	0	0	185	100
South East (West)	28	22	1	1	100	78	0	0	0	0	129	100
South West	36	19	10	5	137	74	2	1	0	0	185	100
West Midlands	39	25	5	3	112	72	0	0	0	0	156	100
North West	54	25	11	5	147	69	1	0	0	0	213	100
Wales	41	32	7	5	81	63	0	0	0	0	129	100
Northern Ireland	12	36	0	0	21	64	0	0	0	0	33	100
Scotland	26	19	6	4	102	75	2	1	0	0	136	100
United Kingdom	**470**	**25**	**72**	**4**	**1321**	**70**	**15**	**1**	**3**	**0**	**1881**	**100**

Table 8 : B5b (Invasive) core biopsy: histological invasive status after surgery												
Region	Invasive		Micro-invasive		Non-invasive		No surgery		Unknown		Total	
	No	%	No	%	No	%	No	%	No	%	No	%
Northern	122	100	0	0	0	0	0	0	0	0	122	100
Yorkshire	401	99	0	0	3	1	0	0	1	0	405	100
Trent	521	97	1	0	6	1	8	1	0	0	536	100
Eastern	580	96	1	0	7	1	17	3	0	0	605	100
London	373	96	0	0	4	1	10	3	0	0	387	100
South East (East)	457	97	5	1	2	0	5	1	0	0	469	100
South East (West)	438	98	0	0	3	1	5	1	0	0	446	100
South West	523	98	0	0	4	1	8	1	0	0	535	100
West Midlands	516	99	0	0	1	0	2	0	0	0	519	100
North West	495	98	2	0	1	0	5	1	0	0	503	100
Wales	370	97	0	0	3	1	9	2	0	0	382	100
Northern Ireland	73	100	0	0	0	0	0	0	0	0	73	100
Scotland	418	99	0	0	2	0	3	1	0	0	423	100
United Kingdom	**5287**	**98**	**9**	**0**	**36**	**1**	**72**	**1**	**1**	**0**	**5405**	**100**

Table 9 : Invasive status of cancers diagnosed by C5 only									
Region	Total	Invasive		Micro-invasive		Non-invasive		Status unknown	
		No.	%	No.	%	No.	%	No.	%
Northern	188	170	90	2	1	13	7	3	2
Yorkshire	32	31	97	0	0	1	3	0	0
Trent	78	75	96	0	0	3	4	0	0
Eastern	131	119	91	2	2	9	7	1	1
London	65	53	82	0	0	8	12	4	6
South East (East)	64	61	95	1	2	1	2	1	2
South East (West)	106	100	94	0	0	4	4	2	2
South West	108	104	96	0	0	4	4	0	0
West Midlands	80	73	91	0	0	5	6	2	3
North West	234	225	96	1	0	5	2	3	1
Wales	42	35	83	0	0	5	12	2	5
Northern Ireland	59	53	90	1	2	5	8	0	0
Scotland	162	147	91	2	1	13	8	0	0
United Kingdom	**1349**	**1246**	**92**	**9**	**1**	**76**	**6**	**18**	**1**

Table 10 : Status of diagnostic open biopsies									
Region	Benign		Malignant		Total		Total women screened	Benign biopsy rate	Malignant biopsy rate
	No.	%	No.	%	No.	%			
Northern	96	57	71	43	167	100	77234	1.2	0.9
Yorkshire	118	62	71	38	189	100	100705	1.2	0.7
Trent	140	66	73	34	213	100	129672	1.1	0.6
Eastern	207	65	110	35	317	100	143527	1.4	0.8
London	155	62	97	38	252	100	138363	1.1	0.7
South East (East)	128	63	76	37	204	100	119182	1.1	0.6
South East (West)	161	58	116	42	277	100	125394	1.3	0.9
South West	171	64	97	36	268	100	130187	1.3	0.7
West Midlands	145	64	82	36	227	100	140616	1.0	0.6
North West	360	69	161	31	521	100	172191	2.1	0.9
Wales	124	72	49	28	173	100	72753	1.7	0.7
Northern Ireland	38	57	29	43	67	100	30434	1.2	1.0
Scotland	175	60	116	40	291	100	127729	1.4	0.9
United Kingdom	**2018**	**64**	**1148**	**36**	**3166**	**100**	**1507987**	**1.3**	**0.8**

Table 11 : Invasive status of malignant diagnostic open biopsies									
Region	Total malignant open biopsies	Invasive		Micro-invasive		Non-invasive		Status unknown	
		No.	%	No.	%	No.	%	No.	%
Northern	71	38	54	0	0	33	46	0	0
Yorkshire	71	21	30	1	1	47	66	2	3
Trent	73	30	41	1	1	41	56	1	1
Eastern	110	48	44	1	1	61	55	0	0
London	97	46	47	2	2	48	49	1	1
South East (East)	76	30	39	0	0	45	59	1	1
South East (West)	116	57	49	2	2	56	48	1	1
South West	97	46	47	2	2	49	51	0	0
West Midlands	82	40	49	0	0	42	51	0	0
North West	161	96	60	3	2	62	39	0	0
Wales	49	23	47	2	4	23	47	1	2
Northern Ireland	29	10	34	0	0	19	66	0	0
Scotland	116	73	63	0	0	43	37	0	0
United Kingdom	**1148**	**558**	**49**	**14**	**1**	**569**	**50**	**7**	**1**

Table 12 : Pre-operative history for cancers with malignant open biopsy									
	Total	No pre-operative procedures		Cytology only		Core biopsy only		Both cytology and core biopsy	
Region		No.	%	No.	%	No.	%	No.	%
Northern	71	1	1	16	23	8	11	46	65
Yorkshire	71	2	3	2	3	59	83	8	11
Trent	73	5	7	2	3	57	78	9	12
Eastern	110	3	3	18	16	48	44	41	37
London	97	7	7	24	25	51	53	15	15
South East (East)	76	4	5	5	7	55	72	12	16
South East (West)	116	11	9	22	19	73	63	10	9
South West	97	8	8	7	7	70	72	12	12
West Midlands	82	1	1	7	9	60	73	14	17
North West	161	15	9	36	22	93	58	17	11
Wales	49	3	6	6	12	35	71	5	10
Northern Ireland	29	1	3	3	10	13	45	12	41
Scotland	116	17	15	24	21	24	21	51	44
United Kingdom	**1148**	**78**	**7**	**172**	**15**	**646**	**56**	**252**	**22**

Table 13 : Pre-operative history for invasive cancers with malignant open biopsy									
	Total	No pre-operative procedures		Cytology only		Core biopsy only		Both cytology and core biopsy	
Region		No.	%	No.	%	No.	%	No.	%
Northern	38	1	3	14	37	6	16	17	45
Yorkshire	21	1	5	1	5	16	76	3	14
Trent	30	1	3	1	3	22	73	6	20
Eastern	48	0	0	18	38	11	23	19	40
London	46	3	7	12	26	21	46	10	22
South East (East)	30	1	3	3	10	18	60	8	27
South East (West)	57	9	16	14	25	26	46	8	14
South West	46	6	13	6	13	26	57	8	17
West Midlands	40	1	3	5	13	24	60	10	25
North West	96	13	14	31	32	41	43	11	11
Wales	23	2	9	2	9	15	65	4	17
Northern Ireland	10	0	0	2	20	2	20	6	60
Scotland	73	12	16	20	27	12	16	29	40
United Kingdom	**558**	**50**	**9**	**129**	**23**	**240**	**43**	**139**	**25**

Table 14 : Pre-operative history for non-invasive cancers with malignant open biopsy									
	Total	No pre-operative procedures		Cytology only		Core biopsy only		Both cytology and core biopsy	
Region		No.	%	No.	%	No.	%	No.	%
Northern	33	0	0	2	6	2	6	29	88
Yorkshire	47	1	2	1	2	41	87	4	9
Trent	41	4	10	0	0	34	83	3	7
Eastern	61	3	5	0	0	37	61	21	34
London	48	4	8	10	21	29	60	5	10
South East (East)	45	2	4	2	4	37	82	4	9
South East (West)	56	2	4	8	14	44	79	2	4
South West	49	2	4	1	2	42	86	4	8
West Midlands	42	0	0	2	5	36	86	4	10
North West	62	2	3	4	6	50	81	6	10
Wales	23	0	0	4	17	18	78	1	4
Northern Ireland	19	1	5	1	5	11	58	6	32
Scotland	43	5	12	4	9	12	28	22	51
United Kingdom	**569**	**26**	**5**	**39**	**7**	**393**	**69**	**111**	**20**

Table 15 : Highest cytology and core biopsy score prior to malignant diagnostic open biopsies											
	Total	No pre-operative procedures		C4, B4 or both		C3, B3 or both		C2, B2 or both		C1, B1 or both	
Region		No.	%	No.	%	No.	%	No.	%	No.	%
Northern	71	1	1	30	42	21	30	11	15	8	11
Yorkshire	71	2	3	35	49	20	28	7	10	7	10
Trent	73	5	7	26	36	21	29	12	16	9	12
Eastern	110	3	3	44	40	31	28	19	17	13	12
London	97	7	7	30	31	43	44	7	7	10	10
South East (East)	76	4	5	28	37	23	30	10	13	11	14
South East (West)	116	11	9	43	37	32	28	9	8	21	18
South West	97	8	8	37	38	22	23	16	16	14	14
West Midlands	82	1	1	24	29	19	23	16	20	22	27
North West	161	15	9	64	40	37	23	23	14	22	14
Wales	49	3	6	18	37	6	12	15	31	7	14
Northern Ireland	29	1	3	7	24	8	28	3	10	10	34
Scotland	116	17	15	43	37	13	11	24	21	19	16
United Kingdom	**1148**	**78**	**7**	**429**	**37**	**296**	**26**	**172**	**15**	**173**	**15**

Table 16 : Highest cytology and core biopsy score prior to malignant open biopsies – invasive cancers											
	Total	No pre-operative procedures		C4, B4 or both		C3, B3 or both		C2, B2 or both		C1, B1 or both	
Region		No.	%	No.	%	No.	%	No.	%	No.	%
Northern	38	1	3	16	42	12	32	6	16	3	8
Yorkshire	21	1	5	12	57	5	24	2	10	1	5
Trent	30	1	3	12	40	8	27	6	20	3	10
Eastern	48	0	0	20	42	11	23	10	21	7	15
London	46	3	7	16	35	18	39	4	9	5	11
South East (East)	30	1	3	10	33	2	7	7	23	10	33
South East (West)	57	9	16	20	35	12	21	5	9	11	19
South West	46	6	13	17	37	7	15	8	17	8	17
West Midlands	40	1	3	14	35	5	13	8	20	12	30
North West	96	13	14	40	42	21	22	12	13	10	10
Wales	23	2	9	7	30	2	9	7	30	5	22
Northern Ireland	10	0	0	3	30	4	40	2	20	1	10
Scotland	73	12	16	26	36	6	8	17	23	12	16
United Kingdom	**558**	**50**	**9**	**213**	**38**	**113**	**20**	**94**	**17**	**88**	**16**

Table 17 : Highest cytology and core biopsy score prior to malignant open biopsies – non-invasive cancers											
	Total	No pre-operative procedures		C4, B4 or both		C3, B3 or both		C2, B2 or both		C1, B1 or both	
Region		No.	%	No.	%	No.	%	No.	%	No.	%
Northern	33	0	0	14	42	9	27	5	15	5	15
Yorkshire	47	1	2	22	47	15	32	4	9	5	11
Trent	41	4	10	14	34	13	32	4	10	6	15
Eastern	61	3	5	24	39	20	33	8	13	6	10
London	48	4	8	13	27	23	48	3	6	5	10
South East (East)	45	2	4	18	40	21	47	3	7	1	2
South East (West)	56	2	4	21	38	20	36	3	5	10	18
South West	49	2	4	19	39	15	31	8	16	5	10
West Midlands	42	0	0	10	24	14	33	8	19	10	24
North West	62	2	3	24	39	16	26	10	16	10	16
Wales	23	0	0	11	48	4	17	6	26	2	9
Northern Ireland	19	1	5	4	21	4	21	1	5	9	47
Scotland	43	5	12	17	40	7	16	7	16	7	16
United Kingdom	**569**	**26**	**5**	**211**	**37**	**181**	**32**	**70**	**12**	**81**	**14**

Table 18 : Number of therapeutic operations (invasive cancers)														
	0		1		2		3+		Unknown		Total		Repeat (2+) rate	
Region	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Northern	11	3	275	77	65	18	5	1	1	0	357	100	70	20
Yorkshire	6	1	411	83	74	15	4	1	1	0	496	100	78	16
Trent	10	1	588	87	80	12	0	0	0	0	678	100	80	12
Eastern	9	1	614	76	114	14	7	1	63	8	807	100	121	15
London	24	4	578	85	62	9	3	0	10	1	677	100	65	10
South East (East)	7	1	509	79	116	18	12	2	0	0	644	100	128	20
South East (West)	13	2	532	85	78	12	5	1	1	0	629	100	83	13
South West	3	0	568	79	136	19	8	1	0	0	715	100	144	20
West Midlands	13	2	564	84	89	13	7	1	0	0	673	100	96	14
North West	6	1	796	86	115	12	5	1	1	0	923	100	120	13
Wales	11	2	401	83	66	14	5	1	0	0	483	100	71	15
Northern Ireland	7	5	126	85	15	10	0	0	0	0	148	100	15	10
Scotland	38	6	546	80	71	10	1	0	25	4	681	100	72	11
United Kingdom	**158**	**2**	**6508**	**82**	**1081**	**14**	**62**	**1**	**102**	**1**	**7911**	**100**	**1143**	**14**

Table 19 : Number of therapeutic operations (non-invasive cancers)														
	0		1		2		3+		Unknown		Total		Repeat (2+) rate	
Region	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Northern	11	13	54	64	16	19	3	4	1	1	85	100	19	22
Yorkshire	20	13	97	62	37	24	3	2	0	0	157	100	40	25
Trent	21	11	130	70	31	17	5	3	0	0	187	100	36	19
Eastern	26	12	129	58	38	17	3	1	27	12	223	100	41	18
London	19	10	143	73	23	12	3	2	9	5	197	100	26	13
South East (East)	23	12	118	63	46	24	1	1	0	0	188	100	47	25
South East (West)	28	17	100	61	34	21	2	1	0	0	164	100	36	22
South West	11	5	123	61	60	30	6	3	1	0	201	100	66	33
West Midlands	12	7	115	71	28	17	3	2	3	2	161	100	31	19
North West	5	2	180	80	38	17	2	1	0	0	225	100	40	18
Wales	4	4	92	81	16	14	2	2	0	0	114	100	18	16
Northern Ireland	8	18	33	73	4	9	0	0	0	0	45	100	4	9
Scotland	30	19	105	65	19	12	1	1	7	4	162	100	20	12
United Kingdom	**218**	**10**	**1419**	**67**	**390**	**18**	**34**	**2**	**48**	**2**	**2109**	**100**	**424**	**20**

Table 20 : Number of therapeutic operations (B5b (Invasive) core biopsies : invasive after surgery)												
	1		2		3+		Unknown		Total		Repeat (2+) rate	
Region	No	%	No	%	No	%	No	%	No	%	No	%
Northern	107	88	14	11	1	1	0	0	122	100	15	12
Yorkshire	343	86	54	13	3	1	1	0	401	100	57	14
Trent	463	89	58	11	0	0	0	0	521	100	58	11
Eastern	465	80	58	10	2	0	55	9	580	100	60	10
London	337	90	29	8	3	1	4	1	373	100	32	9
South East (East)	393	86	57	12	7	2	0	0	457	100	64	14
South East (West)	391	89	43	10	4	1	0	0	438	100	47	11
South West	436	83	84	16	3	1	0	0	523	100	87	17
West Midlands	457	89	54	10	5	1	0	0	516	100	59	11
North West	434	88	58	12	3	1	0	0	495	100	61	12
Wales	330	89	38	10	2	1	0	0	370	100	40	11
Northern Ireland	64	88	9	12	0	0	0	0	73	100	9	12
Scotland	364	87	34	8	1	0	19	5	418	100	35	8
United Kingdom	**4584**	**87**	**590**	**11**	**34**	**1**	**79**	**1**	**5287**	**100**	**624**	**12**

Table 21 : Number of therapeutic operations (invasive cancers with C5 only, no B5)														
	0		1		2		3+		Unknown		Total		Repeat (2+) rate	
Region	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Northern	0	0	134	79	33	19	3	2	0	0	170	100	36	21
Yorkshire	0	0	27	87	4	13	0	0	0	0	31	100	4	13
Trent	0	0	67	89	8	11	0	0	0	0	75	100	8	11
Eastern	0	0	89	75	27	23	3	3	0	0	119	100	30	25
London	0	0	48	91	4	8	0	0	1	2	53	100	4	8
South East (East)	0	0	43	70	17	28	1	2	0	0	61	100	18	30
South East (West)	0	0	89	89	10	10	0	0	1	1	100	100	10	10
South West	1	1	80	77	22	21	1	1	0	0	104	100	23	22
West Midlands	0	0	64	88	9	12	0	0	0	0	73	100	9	12
North West	0	0	209	93	16	7	0	0	0	0	225	100	16	7
Wales	0	0	28	80	6	17	1	3	0	0	35	100	7	20
Northern Ireland	0	0	52	98	1	2	0	0	0	0	53	100	1	2
Scotland	1	1	129	88	17	12	0	0	0	0	147	100	17	12
United Kingdom	**2**	**0**	**1059**	**85**	**174**	**14**	**9**	**1**	**2**	**0**	**1246**	**100**	**183**	**15**

Table 22 : Number of therapeutic operations (B5a (Non-invasive) core biopsies : invasive after surgery)												
	1		2		3+		Unknown		Total		Repeat (2+) rate	
Region	No	%	No	%	No	%	No	%	No	%	No	%
Northern	8	47	8	47	1	6	0	0	17	100	9	53
Yorkshire	17	53	15	47	0	0	0	0	32	100	15	47
Trent	30	68	14	32	0	0	0	0	44	100	14	32
Eastern	27	56	13	27	1	2	7	15	48	100	14	29
London	33	73	12	27	0	0	0	0	45	100	12	27
South East (East)	25	52	22	46	1	2	0	0	48	100	23	48
South East (West)	18	64	10	36	0	0	0	0	28	100	10	36
South West	18	50	16	44	2	6	0	0	36	100	18	50
West Midlands	15	38	23	59	1	3	0	0	39	100	24	62
North West	38	70	16	30	0	0	0	0	54	100	16	30
Wales	21	51	18	44	2	5	0	0	41	100	20	49
Northern Ireland	8	67	4	33	0	0	0	0	12	100	4	33
Scotland	13	50	13	50	0	0	0	0	26	100	13	50
United Kingdom	**271**	**58**	**184**	**39**	**8**	**2**	**7**	**1**	**470**	**100**	**192**	**41**

Table 23 : Number of therapeutic operations (invasive cancers with B1-4, C1-4 only)														
	0		1		2		3+		Unknown		Total		Repeat (2+) rate	
Region	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Northern	11	30	17	46	8	22	0	0	1	3	37	100	8	22
Yorkshire	5	25	14	70	0	0	1	5	0	0	20	100	1	5
Trent	2	7	27	93	0	0	0	0	0	0	29	100	0	0
Eastern	6	13	29	60	11	23	1	2	1	2	48	100	12	25
London	12	28	25	58	4	9	0	0	2	5	43	100	4	9
South East (East)	2	7	12	41	15	52	0	0	0	0	29	100	15	52
South East (West)	6	13	29	60	13	27	0	0	0	0	48	100	13	27
South West	1	3	27	68	11	28	1	3	0	0	40	100	12	30
West Midlands	11	28	24	62	3	8	1	3	0	0	39	100	4	10
North West	0	0	60	72	21	25	1	1	1	1	83	100	22	27
Wales	2	10	17	81	2	10	0	0	0	0	21	100	2	10
Northern Ireland	7	70	2	20	1	10	0	0	0	0	10	100	1	10
Scotland	28	46	27	44	4	7	0	0	2	3	61	100	4	7
United Kingdom	**93**	**18**	**310**	**61**	**93**	**18**	**5**	**1**	**7**	**1**	**508**	**100**	**98**	**19**

Table 24 : Number of therapeutic operations (invasive cancers with no pre-operative procedure recorded)														
	0		1		2		3+		Unknown		Total		Repeat (2+) rate	
Region	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Northern	0	0	1	100	0	0	0	0	0	0	1	100	0	0
Yorkshire	1	100	0	0	0	0	0	0	0	0	1	100	0	0
Trent	0	0	1	100	0	0	0	0	0	0	1	100	0	0
Eastern	0	-	0	-	0	-	0	-	0	-	0	-	0	-
London	0	0	2	67	0	0	0	0	1	33	3	100	0	0
South East (East)	0	0	1	100	0	0	0	0	0	0	1	100	0	0
South East (West)	2	22	4	44	2	22	1	11	0	0	9	100	3	33
South West	0	0	5	83	1	17	0	0	0	0	6	100	1	17
West Midlands	0	0	1	100	0	0	0	0	0	0	1	100	0	0
North West	0	0	12	92	0	0	1	8	0	0	13	100	1	8
Wales	0	0	2	100	0	0	0	0	0	0	2	100	0	0
Northern Ireland	0	-	0	-	0	-	0	-	0	-	0	-	0	-
Scotland	6	50	2	17	0	0	0	0	4	33	12	100	0	0
United Kingdom	**9**	**18**	**31**	**62**	**3**	**6**	**2**	**4**	**5**	**10**	**50**	**100**	**5**	**10**

Table 25 : Number of therapeutic operations (B5a (Non-invasive) core biopsies : non-invasive or micro-invasive after surgery)												
	1		2		3+		Unknown		Total		Repeat (2+) rate	
Region	No	%	No	%	No	%	No	%	No	%	No	%
Northern	30	75	7	18	3	8	0	0	40	100	10	25
Yorkshire	74	70	29	27	3	3	0	0	106	100	32	30
Trent	111	76	30	21	5	3	0	0	146	100	35	24
Eastern	99	67	27	18	1	1	21	14	148	100	28	19
London	67	84	9	11	3	4	1	1	80	100	12	15
South East (East)	96	72	36	27	1	1	0	0	133	100	37	28
South East (West)	72	71	27	27	2	2	0	0	101	100	29	29
South West	95	65	45	31	6	4	1	1	147	100	51	35
West Midlands	86	74	26	22	3	3	2	2	117	100	29	25
North West	130	82	26	16	2	1	0	0	158	100	28	18
Wales	74	84	12	14	2	2	0	0	88	100	14	16
Northern Ireland	19	90	2	10	0	0	0	0	21	100	2	10
Scotland	89	82	15	14	2	2	2	2	108	100	17	16
United Kingdom	**1042**	**75**	**291**	**21**	**33**	**2**	**27**	**2**	**1393**	**100**	**324**	**23**

Table 26 : Number of therapeutic operations (non-invasive or micro-invasive cancers with C5 only, no B5)												
	1		2		3+		Unknown		Total		Repeat (2+) rate	
Region	No	%	No	%	No	%	No	%	No	%	No	%
Northern	8	53	6	40	1	7	0	0	15	100	7	47
Yorkshire	0	0	1	100	0	0	0	0	1	100	1	100
Trent	2	67	1	33	0	0	0	0	3	100	1	33
Eastern	7	64	4	36	0	0	0	0	11	100	4	36
London	6	75	1	13	0	0	1	13	8	100	1	13
South East (East)	2	100	0	0	0	0	0	0	2	100	0	0
South East (West)	3	75	1	25	0	0	0	0	4	100	1	25
South West	3	75	1	25	0	0	0	0	4	100	1	25
West Midlands	5	100	0	0	0	0	0	0	5	100	0	0
North West	5	83	1	17	0	0	0	0	6	100	1	17
Wales	4	80	1	20	0	0	0	0	5	100	1	20
Northern Ireland	6	100	0	0	0	0	0	0	6	100	0	0
Scotland	9	60	5	33	0	0	1	7	15	100	5	33
United Kingdom	**60**	**71**	**22**	**26**	**1**	**1**	**2**	**2**	**85**	**100**	**23**	**27**

Table 27 : Number of therapeutic operations (B5b (Invasive) core biopsies : non-invasive or micro-invasive after surgery)												
	1		2		3+		Unknown		Total		Repeat (2+) rate	
Region	No	%	No	%	No	%	No	%	No	%	No	%
Northern	0	-	0	-	0	-	0	-	0	-	0	-
Yorkshire	3	100	0	0	0	0	0	0	3	100	0	0
Trent	6	86	1	14	0	0	0	0	7	100	1	14
Eastern	6	75	2	25	0	0	0	0	8	100	2	25
London	4	100	0	0	0	0	0	0	4	100	0	0
South East (East)	5	71	2	29	0	0	0	0	7	100	2	29
South East (West)	2	67	1	33	0	0	0	0	3	100	1	33
South West	2	50	2	50	0	0	0	0	4	100	2	50
West Midlands	1	100	0	0	0	0	0	0	1	100	0	0
North West	2	67	1	33	0	0	0	0	3	100	1	33
Wales	3	100	0	0	0	0	0	0	3	100	0	0
Northern Ireland	0	-	0	-	0	-	0	-	0	-	0	-
Scotland	2	100	0	0	0	0	0	0	2	100	0	0
United Kingdom	**36**	**80**	**9**	**20**	**0**	**0**	**0**	**0**	**45**	**100**	**9**	**20**

Table 28 : Number of therapeutic operations (non-invasive cancers with B1-4, C1-4 only)														
	0		1		2		3+		Unknown		Total		Repeat (2+) rate	
Region	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Northern	11	33	16	48	5	15	0	0	1	3	33	100	5	15
Yorkshire	18	39	21	46	7	15	0	0	0	0	46	100	7	15
Trent	18	49	18	49	1	3	0	0	0	0	37	100	1	3
Eastern	24	41	18	31	8	14	2	3	6	10	58	100	10	17
London	14	32	21	48	4	9	0	0	5	11	44	100	4	9
South East (East)	18	42	14	33	11	26	0	0	0	0	43	100	11	26
South East (West)	27	50	23	43	4	7	0	0	0	0	54	100	4	7
South West	10	21	24	51	13	28	0	0	0	0	47	100	13	28
West Midlands	12	29	27	64	2	5	0	0	1	2	42	100	2	5
North West	5	8	43	72	12	20	0	0	0	0	60	100	12	20
Wales	4	17	16	70	3	13	0	0	0	0	23	100	3	13
Northern Ireland	7	39	9	50	2	11	0	0	0	0	18	100	2	11
Scotland	26	68	9	24	0	0	0	0	3	8	38	100	0	0
United Kingdom	**194**	**36**	**259**	**48**	**72**	**13**	**2**	**0**	**16**	**3**	**543**	**100**	**74**	**14**

Table 29 : Number of therapeutic operations (non-invasive cancers with no pre-operative procedure recorded)														
	0		1		2		3+		Unknown		Total		Repeat (2+) rate	
Region	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Northern	0	-	0	-	0	-	0	-	0	-	0	-	0	-
Yorkshire	1	100	0	0	0	0	0	0	0	0	1	100	0	0
Trent	3	75	1	25	0	0	0	0	0	0	4	100	0	0
Eastern	0	0	2	67	0	0	0	0	1	33	3	100	0	0
London	1	25	2	50	1	25	0	0	0	0	4	100	1	25
South East (East)	1	50	0	0	1	50	0	0	0	0	2	100	1	50
South East (West)	1	50	0	0	1	50	0	0	0	0	2	100	1	50
South West	0	0	2	100	0	0	0	0	0	0	2	100	0	0
West Midlands	0	-	0	-	0	-	0	-	0	-	0	-	0	-
North West	0	0	2	100	0	0	0	0	0	0	2	100	0	0
Wales	0	-	0	-	0	-	0	-	0	-	0	-	0	-
Northern Ireland	1	100	0	0	0	0	0	0	0	0	1	100	0	0
Scotland	4	80	0	0	0	0	0	0	1	20	5	100	0	0
United Kingdom	**12**	**46**	**9**	**35**	**3**	**12**	**0**	**0**	**2**	**8**	**26**	**100**	**3**	**12**

Table 30 : Final operation type for invasive cancers with B5b that underwent 2+ therapeutic operations												
	Cons.		Mx.		Axillary		Cons. & Axillary		Mx & Axillary		Total	
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
Northern	10	67	2	13	0	0	1	7	2	13	15	100
Yorkshire	23	40	19	33	0	0	8	14	7	12	57	100
Trent	28	48	21	36	9	16	0	0	0	0	58	100
Eastern	16	27	4	7	6	10	19	32	15	25	60	100
London	5	16	4	13	0	0	19	59	4	13	32	100
South East (East)	26	41	26	41	5	8	4	6	3	5	64	100
South East (West)	8	17	7	15	1	2	17	36	14	30	47	100
South West	28	32	11	13	4	5	23	26	21	24	87	100
West Midlands	23	39	12	20	3	5	14	24	7	12	59	100
North West	12	20	20	33	1	2	15	25	13	21	61	100
Wales	19	48	15	38	0	0	4	10	2	5	40	100
Northern Ireland	1	11	7	78	0	0	1	11	0	0	9	100
Scotland	16	46	11	31	6	17	1	3	1	3	35	100
United Kingdom	**215**	**34**	**159**	**25**	**35**	**6**	**126**	**20**	**89**	**14**	**624**	**100**

Cons. = conservation surgery (eg. wide local excision, quadrantectomy, segmentectomy etc)
Mx = Mastectomy (all types)

Table 31 : Final operation type for invasive cancers with C5 only, no B5 that underwent 2+ therapeutic operations												
	Cons.		Mx.		Axillary		Cons. & Axillary		Mx & Axillary		Total	
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
Northern	13	36	10	28	4	11	2	6	7	19	36	100
Yorkshire	0	0	3	75	0	0	1	25	0	0	4	100
Trent	3	38	5	63	0	0	0	0	0	0	8	100
Eastern	3	10	1	3	0	0	18	60	8	27	30	100
London	2	50	0	0	0	0	2	50	0	0	4	100
South East (East)	8	44	3	17	4	22	2	11	1	6	18	100
South East (West)	2	20	2	20	3	30	2	20	1	10	10	100
South West	8	35	2	9	3	13	6	26	4	17	23	100
West Midlands	2	22	2	22	0	0	0	0	5	56	9	100
North West	6	38	6	38	0	0	1	6	3	19	16	100
Wales	4	57	1	14	0	0	2	29	0	0	7	100
Northern Ireland	1	100	0	0	0	0	0	0	0	0	1	100
Scotland	7	41	2	12	1	6	6	35	1	6	17	100
United Kingdom	**59**	**32**	**37**	**20**	**15**	**8**	**42**	**23**	**30**	**16**	**183**	**100**

Table 32 : Final operation type for invasive cancers with B5a that underwent 2+ therapeutic operations												
	Cons.		Mx.		Axillary		Cons. & Axillary		Mx & Axillary		Total	
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
Northern	3	33	1	11	0	0	4	44	1	11	9	100
Yorkshire	2	13	2	13	2	13	5	33	4	27	15	100
Trent	0	0	1	7	4	29	3	21	6	43	14	100
Eastern	1	7	0	0	1	7	5	36	7	50	14	100
London	1	8	0	0	0	0	7	58	4	33	12	100
South East (East)	3	13	2	9	7	30	5	22	6	26	23	100
South East (West)	1	10	1	10	2	20	3	30	3	30	10	100
South West	4	22	1	6	3	17	4	22	6	33	18	100
West Midlands	1	4	2	8	6	25	8	33	7	29	24	100
North West	1	6	2	13	3	19	4	25	6	38	16	100
Wales	0	0	1	5	1	5	11	55	7	35	20	100
Northern Ireland	0	0	0	0	1	25	1	25	2	50	4	100
Scotland	0	0	1	8	6	46	3	23	3	23	13	100
United Kingdom	**17**	**9**	**14**	**7**	**36**	**19**	**63**	**33**	**62**	**32**	**192**	**100**

Table 33 : Final operation type for invasive cancers with B1-4 core biopsy or C1-4 cytology only that underwent 2+ therapeutic operations												
	Cons.		Mx.		Axillary		Cons. & Axillary		Mx & Axillary		Total	
Region	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Northern	0	0	0	0	0	0	5	63	3	38	8	100
Yorkshire	0	0	1	100	0	0	0	0	0	0	1	100
Trent	0	-	0	-	0	-	0	-	0	-	0	-
Eastern	2	17	0	0	1	8	7	58	2	17	12	100
London	0	0	0	0	0	0	3	75	1	25	4	100
South East (East)	2	13	3	20	8	53	0	0	2	13	15	100
South East (West)	3	23	0	0	2	15	2	15	6	46	13	100
South West	3	25	1	8	1	8	1	8	6	50	12	100
West Midlands	0	0	2	50	0	0	0	0	2	50	4	100
North West	5	23	1	5	5	23	9	41	2	9	22	100
Wales	0	0	1	50	1	50	0	0	0	0	2	100
Northern Ireland	0	0	1	100	0	0	0	0	0	0	1	100
Scotland	0	0	0	0	3	75	0	0	1	25	4	100
United Kingdom	**15**	**15**	**10**	**10**	**21**	**21**	**27**	**28**	**25**	**26**	**98**	**100**

Table 34 : Final operation type for cancers with no pre-operative procedure recorded that underwent 2+ therapeutic operations as well as a diagnostic open biopsy														
	Invasive cancers								Non-invasive cancers					
	Cons. Surgery		Axillary		Cons. & Axillary		Total		Cons.		Mx.		Total	
Region	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
London	0	-	0	-	0	-	0	-	1	100	0	0	1	100
South East (East)	0	-	0	-	0	-	0	-	0	0	1	100	1	100
South East (West)	0	0	0	0	3	100	3	100	1	100	0	0	1	100
South West	0	0	1	100	0	0	1	100	0	-	0	-	0	-
North West	1	100	0	0	0	0	1	100	0	-	0	-	0	-
United Kingdom	**1**	**20**	**1**	**20**	**3**	**60**	**5**	**100**	**2**	**67**	**1**	**33**	**3**	**100**

Table 35 : Final operation type for non-invasive and micro-invasives cancers with B5a that underwent 2+ therapeutic operations												
	Cons.		Mx.		Axillary		Cons. & Axillary		Mx & Axillary		Total	
Region	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Northern	5	50	1	10	1	10	0	0	3	30	10	100
Yorkshire	14	44	13	41	0	0	0	0	5	16	32	100
Trent	19	54	12	34	0	0	0	0	4	11	35	100
Eastern	20	71	6	21	0	0	0	0	2	7	28	100
London	6	50	3	25	0	0	2	17	1	8	12	100
South East (East)	26	70	5	14	1	3	0	0	5	14	37	100
South East (West)	18	62	6	21	0	0	1	3	4	14	29	100
South West	24	47	14	27	2	4	2	4	9	18	51	100
West Midlands	13	45	6	21	0	0	1	3	9	31	29	100
North West	18	64	4	14	0	0	2	7	4	14	28	100
Wales	7	50	6	43	0	0	0	0	1	7	14	100
Northern Ireland	1	50	1	50	0	0	0	0		0	2	100
Scotland	8	47	2	12	1	6	0	0	6	35	17	100
United Kingdom	**179**	**55**	**79**	**24**	**5**	**2**	**8**	**2**	**53**	**16**	**324**	**100**

Table 36 : Final operation type for non-invasive and micro-invasives cancers with C5 only, no B5 that underwent 2+ therapeutic operations												
	Cons.		Mx.		Axillary		Cons. & Axillary		Mx & Axillary		Total	
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
Northern	2	29	2	29	0	0	1	14	2	29	7	100
Yorkshire	0	0	0	0	0	0	1	100	0	0	1	100
Trent	0	0	1	100	0	0	0	0	0	0	1	100
Eastern	2	50	0	0	0	0	1	25	1	25	4	100
London	1	100	0	0	0	0	0	0	0	0	1	100
South East (East)	0	-	0	-	0	0	0	-	0	-	0	-
South East (West)	0	0	0	0	0	0	1	100	0	0	1	100
South West	0	0	0	0	0	0	0	0	1	100	1	100
West Midlands	0	-	0	-	0	0	0	-	0	-	0	-
North West	1	100	0	0	0	0	0	0	0	0	1	100
Wales	0	0	1	100	0	0	0	0	0	0	1	100
Northern Ireland	0	-	0	-	0	0	0	-	0	-	0	-
Scotland	4	80	0	0	0	0	0	0	1	20	5	100
United Kingdom	**10**	**43**	**4**	**17**	**0**	**0**	**4**	**17**	**5**	**22**	**23**	**100**

Table 37 : Final operation type for non-invasive and micro-invasives cancers with B5b that underwent 2+ therapeutic operations												
	Cons.		Mx.		Axillary		Cons. & Axillary		Mx & Axillary		Total	
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
Trent	0	0	0	0	1	100	0	0	0	0	1	100
Eastern	2	100	0	0	0	0	0	0	0	0	2	100
South East (East)	2	100	0	0	0	0	0	0	0	0	2	100
South East (West)	0	0	0	0	0	0	0	0	1	100	1	100
South West	1	50	0	0	0	0	1	50	0	0	2	100
North West	0	0	0	0	0	0	1	100	0	0	1	100
United Kingdom	**5**	**56**	**0**	**0**	**1**	**11**	**2**	**22**	**1**	**11**	**9**	**100**

Table 38 : Final operation type for non-invasive cancers with B1-4 core biopsy or C1-4 cytology only that underwent 2+ therapeutic operations												
	Cons.		Mx.		Axillary		Cons. & Axillary		Mx & Axillary		Total	
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
Northern	2	40	0	0	0	0	0	0	3	60	5	100
Yorkshire	2	29	4	57	0	0	0	0	1	14	7	100
Trent	0	0	1	100	0	0	0	0	0	0	1	100
Eastern	9	90	1	10	0	0	0	0	0	0	10	100
London	0	0	3	75	0	0	1	25	0	0	4	100
South East (East)	5	45	5	45	0	0	0	0	1	9	11	100
South East (West)	2	50	0	0	0	0	1	25	1	25	4	100
South West	11	85	2	15	0	0	0	0	0	0	13	100
West Midlands	0	0	0	0	0	0	0	0	2	100	2	100
North West	8	67	2	17	0	0	0	0	2	17	12	100
Wales	0	0	1	33	0	0	1	33	1	33	3	100
Northern Ireland	2	100	0	0	0	0	0	0	0	0	2	100
Scotland	0	-	0	-	0	0	0	-	0	-	0	-
United Kingdom	**41**	**55**	**19**	**26**	**0**	**0**	**3**	**4**	**11**	**15**	**74**	**100**

Table 39 : Treatment for non-invasive and micro-invasive breast cancers										
	Conservation surgery		Mastectomy		No surgery		Unknown		Total	
Region	No.	%	No.	%	No.	%	No.	%	No.	%
Northern	57	63	33	36	0	0	1	1	91	100
Yorkshire	99	62	59	37	1	1	0	0	159	100
Trent	116	59	82	41	0	0	0	0	198	100
Eastern	179	77	52	22	2	1	0	0	233	100
London	143	70	45	22	11	5	4	2	203	100
South East (East)	135	66	65	32	4	2	0	0	204	100
South East (West)	131	78	36	22	0	0	0	0	167	100
South West	147	69	65	30	1	0	1	0	214	100
West Midlands	107	64	56	34	0	0	3	2	166	100
North West	175	72	64	26	5	2	0	0	244	100
Wales	78	63	45	37	0	0	0	0	123	100
Northern Ireland	38	83	8	17	0	0	0	0	46	100
Scotland	122	72	41	24	0	0	7	4	170	100
United Kingdom	**1527**	**69**	**651**	**29**	**24**	**1**	**16**	**1**	**2218**	**100**

Table 40 : Nuclear grade of non-invasive cancers										
	High		Other		Not assessable		Unknown		Total non-invasive cancers	
Region	No.	%	No.	%	No.	%	No.	%	No.	%
Northern	47	55	36	42	2	2	0	0	85	100
Yorkshire	81	52	70	45	4	3	2	1	157	100
Trent	106	57	79	42	2	1	0	0	187	100
Eastern	83	37	77	35	1	0	62	28	223	100
London	92	47	79	40	11	6	15	8	197	100
South East (East)	90	48	82	44	6	3	10	5	188	100
South East (West)	94	57	64	39	2	1	4	2	164	100
South West	104	52	83	41	5	2	9	4	201	100
West Midlands	94	58	60	37	2	1	5	3	161	100
North West	122	54	91	40	0	0	12	5	225	100
Wales	44	39	66	58	0	0	4	4	114	100
Northern Ireland	21	47	24	53	0	0	0	0	45	100
Scotland	39	24	23	14	1	1	99	61	162	100
United Kingdom	**1017**	**48**	**834**	**40**	**36**	**2**	**222**	**11**	**2109**	**100**

Table 41 : Disease extent of non-invasive cancers														
Region	Localised		Multiple		Not assessable		Unknown disease extent with...						Total non-invasive	
							Size known		Size not assessable		Size unknown			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Northern	56	66	9	11	5	6	15	18	0	0	0	0	85	100
Yorkshire	70	45	20	13	10	6	49	31	0	0	8	5	157	100
Trent	142	76	30	16	15	8	0	0	0	0	0	0	187	100
Eastern	58	26	13	6	27	12	83	37	2	1	40	18	223	100
London	70	36	19	10	5	3	76	39	0	0	27	14	197	100
South East (East)	78	41	10	5	7	4	76	40	0	0	17	9	188	100
South East (West)	69	42	14	9	20	12	55	34	0	0	6	4	164	100
South West	76	38	26	13	14	7	62	31	1	0	22	11	201	100
West Midlands	125	78	11	7	6	4	13	8	0	0	6	4	161	100
North West	83	37	16	7	7	3	64	28	2	1	53	24	225	100
Wales	53	46	11	10	5	4	41	36	1	1	3	3	114	100
Northern Ireland	15	33	4	9	4	9	17	38	0	0	5	11	45	100
Scotland	50	31	3	2	3	2	97	60	1	1	8	5	162	100
United Kingdom	**945**	**45**	**186**	**9**	**128**	**6**	**648**	**31**	**7**	**0**	**195**	**9**	**2109**	**100**

Table 42 : Size of non-invasive cancers												
	<15mm		15-<30mm		30+ mm		Size not assessable		Size unknown		Total non-invasive	
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
Northern	38	45	21	25	19	22	1	1	6	7	85	100
Yorkshire	56	36	43	27	35	22	0	0	23	15	157	100
Trent	91	49	52	28	39	21	4	2	1	1	187	100
Eastern	101	45	52	23	21	9	5	2	44	20	223	100
London	88	45	45	23	21	11	1	1	42	21	197	100
South East (East)	67	36	61	32	32	17	2	1	26	14	188	100
South East (West)	75	46	54	33	20	12	8	5	7	4	164	100
South West	84	42	54	27	24	12	7	3	32	16	201	100
West Midlands	69	43	43	27	40	25	2	1	7	4	161	100
North West	81	36	50	22	21	9	8	4	65	29	225	100
Wales	48	42	35	31	19	17	3	3	9	8	114	100
Northern Ireland	18	40	14	31	7	16	0	0	6	13	45	100
Scotland	65	40	56	35	26	16	6	4	9	6	162	100
United Kingdom	**881**	**42**	**580**	**28**	**324**	**15**	**47**	**2**	**277**	**13**	**2109**	**100**

Table 43 : Data completeness for non-invasive cancers										
Region	**Unknown nuclear grade**		**Unknown disease extent**		**Unknown size**		**Unknown grade, extent or size**		**Total non-invasives**	
	No.	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
Northern	0	0	15	18	6	7	21	25	85	100
Yorkshire	2	1	57	36	23	15	72	46	157	100
Trent	0	0	0	0	1	1	1	1	187	100
Eastern	62	28	125	56	44	20	130	58	223	100
London	15	8	103	52	42	21	122	62	197	100
South East (East)	10	5	93	49	26	14	102	54	188	100
South East (West)	4	2	61	37	7	4	62	38	164	100
South West	9	4	85	42	32	16	97	48	201	100
West Midlands	5	3	19	12	7	4	20	12	161	100
North West	12	5	119	53	65	29	133	59	225	100
Wales	4	4	45	39	9	8	52	46	114	100
Northern Ireland	0	0	22	49	6	13	23	51	45	100
Scotland	99	61	106	65	9	6	109	67	162	100
United Kingdom	**222**	**11**	**850**	**40**	**277**	**13**	**944**	**45**	**2109**	**100**

Table 44 : Treatment of high grade multi-focal non-invasive cancers						
	Conservation Surgery		**Mastectomy**		**Total**	
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**
Northern	1	17	5	83	6	100
Yorkshire	3	38	5	63	8	100
Trent	1	6	17	94	18	100
Eastern	1	50	1	50	2	100
London	3	43	4	57	7	100
South East (East)	2	25	6	75	8	100
South East (West)	2	20	8	80	10	100
South West	9	50	9	50	18	100
West Midlands	2	33	4	67	6	100
North West	3	25	9	75	12	100
Wales	0	0	4	100	4	100
Northern Ireland	1	50	1	50	2	100
Scotland	0	0	1	100	1	100
United Kingdom	**28**	**27**	**74**	**73**	**102**	**100**

Table 45 : Treatment of non-invasive cases with high grade, unknown disease extent and unknown or not assessable size										
	Conservation Surgery		Mastectomy		Unknown		No Surgery		Total	
Region	No.	%	No.	%	No.	%	No.	%	No.	%
Northern	0	-	0	-	0	-	0	-	0	-
Yorkshire	1	50	1	50	0	0	0	0	2	100
Trent	0	-	0	-	0	-	0	-	0	-
Eastern	1	50	1	50	0	0	0	0	2	100
London	7	88	0	0	0	0	1	13	8	100
South East (East)	0	0	3	100	0	0	0	0	3	100
South East (West)	1	33	2	67	0	0	0	0	3	100
South West	5	63	3	38	0	0	0	0	8	100
West Midlands	0	0	1	100	0	0	0	0	1	100
North West	10	67	5	33	0	0	0	0	15	100
Wales	0	0	2	100	0	0	0	0	2	100
Northern Ireland	1	50	1	50	0	0	0	0	2	100
Scotland	0	-	0	-	0	-	0	-	0	-
United Kingdom	**26**	**57**	**19**	**41**	**0**	**0**	**1**	**2**	**46**	**100**

Table 46 : Treatment of non-invasive cancers with unknown grade, unknown disease extent and unknown or not assessable size										
	Conservation Surgery		Mastectomy		No surgery		Unknown		Total	
Region	No.	%	No.	%	No.	%	No.	%	No.	%
Northern	0	-	0	-	0	-	0	-	0	-
Yorkshire	0	-	0	-	0	-	0	-	0	-
Trent	0	-	0	-	0	-	0	-	0	-
Eastern	25	78	5	16	0	0	2	6	32	100
London	6	60	0	0	2	20	2	20	10	100
South East (East)	6	60	0	0	0	0	4	40	10	100
South East (West)	1	50	1	50	0	0	0	0	2	100
South West	3	75	0	0	0	0	1	25	4	100
West Midlands	2	40	1	20	2	40	0	0	5	100
North West	8	100	0	0	0	0	0	0	8	100
Wales	0	-	0	-	0	-	0	-	0	-
Northern Ireland	0	-	0	-	0	-	0	-	0	-
Scotland	5	63	2	25	1	13	0	0	8	100
United Kingdom	**56**	**71**	**9**	**11**	**5**	**6**	**9**	**11**	**79**	**100**

Table 47 : Treatment of multi-focal non-invasive cancers (30+mm)						
	Conservation Surgery		Mastectomy		Total	
Region	No.	%	No.	%	No.	%
Northern	0	0	2	100	2	100
Yorkshire	3	75	1	25	4	100
Trent	0	0	14	100	14	100
Eastern	2	40	3	60	5	100
London	3	50	3	50	6	100
South East (East)	1	20	4	80	5	100
South East (West)	0	0	4	100	4	100
South West	9	50	9	50	18	100
West Midlands	0	0	5	100	5	100
North West	0	0	4	100	4	100
Wales	0	0	4	100	4	100
Northern Ireland	1	33	2	67	3	100
Scotland	0	0	1	100	1	100
United Kingdom	**19**	**25**	**56**	**75**	**75**	**100**

Table 48 : Treatment for invasive breast cancers of all sizes including size unknown										
	Conservation surgery		Mastectomy		No surgery		Unknown		Total	
Region	No.	%	No.	%	No.	%	No.	%	No.	%
Northern	250	70	106	30	0	0	1	0	357	100
Yorkshire	327	66	168	34	0	0	1	0	496	100
Trent	442	65	228	34	8	1	0	0	678	100
Eastern	583	72	220	27	3	0	1	0	807	100
London	537	79	122	18	12	2	6	1	677	100
South East (East)	459	71	180	28	5	1	0	0	644	100
South East (West)	474	75	149	24	5	1	1	0	629	100
South West	504	70	209	29	2	0	0	0	715	100
West Midlands	471	70	200	30	2	0	0	0	673	100
North West	649	70	267	29	6	1	1	0	923	100
Wales	313	65	161	33	9	2	0	0	483	100
Northern Ireland	107	72	41	28	0	0	0	0	148	100
Scotland	459	67	190	28	7	1	25	4	681	100
United Kingdom	**5575**	**70**	**2241**	**28**	**59**	**1**	**36**	**0**	**7911**	**100**

Table 49 : Size of invasive breast cancers														
	<10mm		10-<15mm		15-<20mm		20-<50mm		50+mm		Unknown		Total	
Region	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Northern	89	25	127	36	63	18	70	20	7	2	1	0	357	100
Yorkshire	124	25	115	23	100	20	127	26	14	3	16	3	496	100
Trent	174	26	190	28	135	20	162	24	13	2	4	1	678	100
Eastern	215	27	222	28	183	23	169	21	10	1	8	1	807	100
London	182	27	175	26	111	16	154	23	14	2	41	6	677	100
South East (East)	167	26	182	28	132	20	151	23	7	1	5	1	644	100
South East (West)	136	22	196	31	139	22	140	22	8	1	10	2	629	100
South West	171	24	233	33	139	19	159	22	5	1	8	1	715	100
West Midlands	140	21	203	30	135	20	175	26	15	2	5	1	673	100
North West	243	26	262	28	178	19	210	23	24	3	6	1	923	100
Wales	128	27	137	28	102	21	97	20	4	1	15	3	483	100
Northern Ireland	36	24	46	31	23	16	37	25	5	3	1	1	148	100
Scotland	152	22	188	28	142	21	186	27	7	1	6	1	681	100
United Kingdom	**1957**	**25**	**2276**	**29**	**1582**	**20**	**1837**	**23**	**133**	**2**	**126**	**2**	**7911**	**100**

Table 50 : Treatment for invasive breast cancers <10mm										
	Conservation surgery		Mastectomy		No surgery		Unknown		Total	
Region	No.	%	No.	%	No.	%	No.	%	No.	%
Northern	70	79	18	20	0	0	1	1	89	100
Yorkshire	88	71	35	28	0	0	1	1	124	100
Trent	138	79	36	21	0	0	0	0	174	100
Eastern	161	75	54	25	0	0	0	0	215	100
London	156	86	25	14	0	0	1	1	182	100
South East (East)	122	73	45	27	0	0	0	0	167	100
South East (West)	109	80	27	20	0	0	0	0	136	100
South West	135	79	36	21	0	0	0	0	171	100
West Midlands	114	81	26	19	0	0	0	0	140	100
North West	192	79	51	21	0	0	0	0	243	100
Wales	101	79	27	21	0	0	0	0	128	100
Northern Ireland	28	78	8	22	0	0	0	0	36	100
Scotland	122	80	26	17	0	0	4	3	152	100
United Kingdom	**1536**	**78**	**414**	**21**	**0**	**0**	**7**	**0**	**1957**	**100**

Table 51 : Treatment for invasive breast cancers 10-<15mm										
	Conservation surgery		Mastectomy		No surgery		Unknown		Total	
Region	No.	%	No.	%	No.	%	No.	%	No.	%
Northern	97	76	30	24	0	0	0	0	127	100
Yorkshire	92	80	23	20	0	0	0	0	115	100
Trent	145	76	43	23	2	1	0	0	190	100
Eastern	172	77	49	22	0	0	1	0	222	100
London	152	87	22	13	1	1	0	0	175	100
South East (East)	147	81	35	19	0	0	0	0	182	100
South East (West)	170	87	26	13	0	0	0	0	196	100
South West	180	77	53	23	0	0	0	0	233	100
West Midlands	159	78	44	22	0	0	0	0	203	100
North West	201	77	60	23	0	0	1	0	262	100
Wales	99	72	38	28	0	0	0	0	137	100
Northern Ireland	39	85	7	15	0	0	0	0	46	100
Scotland	144	77	35	19	0	0	9	5	188	100
United Kingdom	**1797**	**79**	**465**	**20**	**3**	**0**	**11**	**0**	**2276**	**100**

Table 52 : Treatment for invasive breast cancers <15mm										
	Conservation surgery		Mastectomy		No surgery		Unknown		Total	
Region	No.	%	No.	%	No.	%	No.	%	No.	%
Northern	167	77	48	22	0	0	1	0	216	100
Yorkshire	180	75	58	24	0	0	1	0	239	100
Trent	283	78	79	22	2	1	0	0	364	100
Eastern	333	76	103	24	0	0	1	0	437	100
London	308	86	47	13	1	0	1	0	357	100
South East (East)	269	77	80	23	0	0	0	0	349	100
South East (West)	279	84	53	16	0	0	0	0	332	100
South West	315	78	89	22	0	0	0	0	404	100
West Midlands	273	80	70	20	0	0	0	0	343	100
North West	393	78	111	22	0	0	1	0	505	100
Wales	200	75	65	25	0	0	0	0	265	100
Northern Ireland	67	82	15	18	0	0	0	0	82	100
Scotland	266	78	61	18	0	0	13	4	340	100
United Kingdom	**3333**	**79**	**879**	**21**	**3**	**0**	**18**	**0**	**4233**	**100**

Table 53 : Treatment for invasive breast cancers 15-<20mm										
	Conservation surgery		Mastectomy		No surgery		Unknown		Total	
Region	No.	%	No.	%	No.	%	No.	%	No.	%
Northern	45	71	18	29	0	0	0	0	63	100
Yorkshire	74	74	26	26	0	0	0	0	100	100
Trent	89	66	46	34	0	0	0	0	135	100
Eastern	142	78	41	22	0	0	0	0	183	100
London	96	86	14	13	1	1	0	0	111	100
South East (East)	99	75	33	25	0	0	0	0	132	100
South East (West)	114	82	25	18	0	0	0	0	139	100
South West	95	68	44	32	0	0	0	0	139	100
West Midlands	99	73	36	27	0	0	0	0	135	100
North West	127	71	51	29	0	0	0	0	178	100
Wales	66	65	36	35	0	0	0	0	102	100
Northern Ireland	21	91	2	9	0	0	0	0	23	100
Scotland	100	70	34	24	2	1	6	4	142	100
United Kingdom	**1167**	**74**	**406**	**26**	**3**	**0**	**6**	**0**	**1582**	**100**

Table 54 : Treatment for invasive breast cancers 20-<50mm										
	Conservation surgery		Mastectomy		No surgery		Unknown		Total	
Region	No.	%	No.	%	No.	%	No.	%	No.	%
Northern	37	53	33	47	0	0	0	0	70	100
Yorkshire	62	49	65	51	0	0	0	0	127	100
Trent	68	42	92	57	2	1	0	0	162	100
Eastern	102	60	67	40	0	0	0	0	169	100
London	112	73	39	25	2	1	1	1	154	100
South East (East)	91	60	60	40	0	0	0	0	151	100
South East (West)	79	56	60	43	0	0	1	1	140	100
South West	89	56	70	44	0	0	0	0	159	100
West Midlands	93	53	82	47	0	0	0	0	175	100
North West	116	55	92	44	2	1	0	0	210	100
Wales	44	45	53	55	0	0	0	0	97	100
Northern Ireland	19	51	18	49	0	0	0	0	37	100
Scotland	92	49	86	46	2	1	6	3	186	100
United Kingdom	**1004**	**55**	**817**	**44**	**8**	**0**	**8**	**0**	**1837**	**100**

Table 55 : Treatment for invasive breast cancers 50+mm										
	Conservation surgery		Mastectomy		No surgery		Unknown		Total	
Region	No.	%	No.	%	No.	%	No.	%	No.	%
Northern	1	14	6	86	0	0	0	0	7	100
Yorkshire	0	0	14	100	0	0	0	0	14	100
Trent	1	8	10	77	2	15	0	0	13	100
Eastern	1	10	9	90	0	0	0	0	10	100
London	1	7	13	93	0	0	0	0	14	100
South East (East)	0	0	7	100	0	0	0	0	7	100
South East (West)	0	0	8	100	0	0	0	0	8	100
South West	1	20	4	80	0	0	0	0	5	100
West Midlands	3	20	12	80	0	0	0	0	15	100
North West	11	46	13	54	0	0	0	0	24	100
Wales	0	0	4	100	0	0	0	0	4	100
Northern Ireland	0	0	5	100	0	0	0	0	5	100
Scotland	0	0	7	100	0	0	0	0	7	100
United Kingdom	**19**	**14**	**112**	**84**	**2**	**2**	**0**	**0**	**133**	**100**

Table 56 : Whole size of invasive breast cancers														
	<10mm		10-<15mm		15-<20mm		20-<50mm		50+mm		Unknown		Total	
Region	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Northern	45	13	94	26	65	18	74	21	18	5	61	17	357	100
Yorkshire	35	7	58	12	67	14	124	25	16	3	196	40	496	100
Trent	111	16	183	27	138	20	206	30	37	5	3	0	678	100
Eastern	137	17	206	26	175	22	218	27	19	2	52	6	807	100
London	60	9	89	13	94	14	118	17	10	1	306	45	677	100
South East (East)	67	10	96	15	89	14	132	20	9	1	251	39	644	100
South East (West)	48	8	102	16	95	15	148	24	10	2	226	36	629	100
South West	111	16	184	26	158	22	217	30	12	2	33	5	715	100
West Midlands	70	10	173	26	140	21	222	33	24	4	44	7	673	100
North West	197	21	251	27	194	21	236	26	39	4	6	1	923	100
Wales	67	14	116	24	82	17	108	22	12	2	98	20	483	100
Northern Ireland	18	12	42	28	33	22	47	32	7	5	1	1	148	100
Scotland	135	20	179	26	141	21	197	29	12	2	17	2	681	100
United Kingdom	**1101**	**14**	**1773**	**22**	**1471**	**19**	**2047**	**26**	**225**	**3**	**1294**	**16**	**7911**	**100**

Table 57 : Whole size of invasive cancers with invasive size <15mm												
	Whole size unknown		Whole size <15mm		Whole size 15-<20mm		Whole size 20-<50mm		Whole size 50+mm		Total	
Region	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Northern	35	16	139	64	19	9	12	6	11	5	216	100
Yorkshire	87	36	91	38	22	9	35	15	4	2	239	100
Trent	0	0	293	80	27	7	30	8	14	4	364	100
Eastern	25	6	343	78	31	7	32	7	6	1	437	100
London	158	44	141	39	29	8	27	8	2	1	357	100
South East (East)	124	36	162	46	25	7	35	10	3	1	349	100
South East (West)	122	37	150	45	25	8	30	9	5	2	332	100
South West	17	4	295	73	50	12	39	10	3	1	404	100
West Midlands	15	4	243	71	35	10	42	12	8	2	343	100
North West	0	0	448	89	28	6	23	5	6	1	505	100
Wales	50	19	182	69	13	5	17	6	3	1	265	100
Northern Ireland	0	0	60	73	13	16	8	10	1	1	82	100
Scotland	3	1	314	92	9	3	10	3	4	1	340	100
United Kingdom	**636**	**15**	**2861**	**68**	**326**	**8**	**340**	**8**	**70**	**2**	**4233**	**100**

Table 58 : Treatment for invasive breast cancers <15mm with whole size <15mm										
	Conservation surgery		Mastectomy		No surgery		Unknown		Total	
Region	No.	%	No.	%	No.	%	No.	%	No.	%
Northern	118	85	20	14	0	0	1	1	139	100
Yorkshire	80	88	11	12	0	0	0	0	91	100
Trent	245	84	46	16	2	1	0	0	293	100
Eastern	280	82	62	18	0	0	1	0	343	100
London	133	94	8	6	0	0	0	0	141	100
South East (East)	138	85	24	15	0	0	0	0	162	100
South East (West)	137	91	13	9	0	0	0	0	150	100
South West	244	83	51	17	0	0	0	0	295	100
West Midlands	215	88	28	12	0	0	0	0	243	100
North West	359	80	88	20	0	0	1	0	448	100
Wales	154	85	28	15	0	0	0	0	182	100
Northern Ireland	51	85	9	15	0	0	0	0	60	100
Scotland	250	80	53	17	0	0	11	4	314	100
United Kingdom	**2404**	**84**	**441**	**15**	**2**	**0**	**14**	**0**	**2861**	**100**

Table 59 : Treatment for invasive breast cancers <15mm with whole size <15mm or whole size unknown										
	Conservation surgery		Mastectomy		No surgery		Unknown		Total	
Region	No.	%	No.	%	No.	%	No.	%	No.	%
Northern	141	81	32	18	0	0	1	1	174	100
Yorkshire	143	80	35	20	0	0	0	0	178	100
Trent	245	84	46	16	2	1	0	0	293	100
Eastern	300	82	67	18	0	0	1	0	368	100
London	264	88	34	11	0	0	1	0	299	100
South East (East)	236	83	50	17	0	0	0	0	286	100
South East (West)	235	86	37	14	0	0	0	0	272	100
South West	255	82	57	18	0	0	0	0	312	100
West Midlands	228	88	30	12	0	0	0	0	258	100
North West	359	80	88	20	0	0	1	0	448	100
Wales	180	78	52	22	0	0	0	0	232	100
Northern Ireland	51	85	9	15	0	0	0	0	60	100
Scotland	253	80	53	17	0	0	11	3	317	100
United Kingdom	**2890**	**83**	**590**	**17**	**2**	**0**	**15**	**0**	**3497**	**100**

Table 60 : Treatment for invasive breast cancers <15mm with whole size 15-<20mm						
	Conservation Surgery		Mastectomy		Total	
Region	No.	%	No.	%	No.	%
Northern	16	84	3	16	19	100
Yorkshire	17	77	5	23	22	100
Trent	20	74	7	26	27	100
Eastern	21	68	10	32	31	100
London	26	90	3	10	29	100
South East (East)	18	72	7	28	25	100
South East (West)	21	84	4	16	25	100
South West	38	76	12	24	50	100
West Midlands	23	66	12	34	35	100
North West	22	79	6	21	28	100
Wales	10	77	3	23	13	100
Northern Ireland	11	85	2	15	13	100
Scotland	7	78	2	22	9	100
United Kingdom	**250**	**77**	**76**	**23**	**326**	**100**

Table 61 : Treatment for invasive breast cancers <15mm with whole size 20-49mm								
	Conservation surgery		Mastectomy		Unknown		Total	
Region	No.	%	No.	%	No.	%	No.	%
Northern	9	75	3	25	0	0	12	100
Yorkshire	19	54	15	43	1	3	35	100
Trent	17	57	13	43	0	0	30	100
Eastern	11	34	21	66	0	0	32	100
London	18	67	9	33	0	0	27	100
South East (East)	14	40	21	60	0	0	35	100
South East (West)	22	73	8	27	0	0	30	100
South West	22	56	17	44	0	0	39	100
West Midlands	22	52	20	48	0	0	42	100
North West	10	43	13	57	0	0	23	100
Wales	10	59	7	41	0	0	17	100
Northern Ireland	5	63	3	38	0	0	8	100
Scotland	5	50	4	40	1	10	10	100
United Kingdom	**184**	**54**	**154**	**45**	**2**	**1**	**340**	**100**

Table 62 : Treatment for invasive breast cancers <15mm with whole size 50+mm										
	Conservation surgery		Mastectomy		No Surgery		Unknown		Total	
Region	No.	%	No.	%	No.	%	No.	%	No.	%
Northern	1	9	10	91	0	0	0	0	11	100
Yorkshire	1	25	3	75	0	0	0	0	4	100
Trent	1	7	13	93	0	0	0	0	14	100
Eastern	1	17	5	83	0	0	0	0	6	100
London	0	0	1	50	1	50	0	0	2	100
South East (East)	1	33	2	67	0	0	0	0	3	100
South East (West)	1	20	4	80	0	0	0	0	5	100
South West	0	0	3	100	0	0	0	0	3	100
West Midlands	0	0	8	100	0	0	0	0	8	100
North West	2	33	4	67	0	0	0	0	6	100
Wales	0	0	3	100	0	0	0	0	3	100
Northern Ireland	0	0	1	100	0	0	0	0	1	100
Scotland	1	25	2	50	0	0	1	25	4	100
United Kingdom	**9**	**13**	**59**	**84**	**1**	**1**	**1**	**1**	**70**	**100**

Table 63 : Availability of lymph node status for invasive cancers									
Region	Total invasive cancers	Nodal status known		Nodes obtained but status unknown		No nodes obtained		Unknown if nodes obtained	
		No.	%	No.	%	No.	%	No.	%
Northern	357	348	97	0	0	9	3	0	0
Yorkshire	496	489	99	0	0	7	1	0	0
Trent	678	661	97	0	0	17	3	0	0
Eastern	807	742	92	0	0	65	8	0	0
London	677	583	86	0	0	74	11	20	3
South East (East)	644	620	96	0	0	24	4	0	0
South East (West)	629	582	93	0	0	46	7	1	0
South West	715	669	94	0	0	46	6	0	0
West Midlands	673	657	98	0	0	16	2	0	0
North West	923	838	91	0	0	84	9	1	0
Wales	483	469	97	0	0	14	3	0	0
Northern Ireland	148	135	91	0	0	11	7	2	1
Scotland	681	672	99	0	0	9	1	0	0
United Kingdom	**7911**	**7465**	**94**	**0**	**0**	**422**	**5**	**24**	**0**

Table 64 : Nodal status of nodes with status known for invasive cancers					
Region	Total known nodal status	Positive		Negative	
		No.	%	No.	%
Northern	348	61	18	287	82
Yorkshire	489	119	24	370	76
Trent	661	156	24	505	76
Eastern	742	173	23	569	77
London	583	153	26	430	74
South East (East)	620	157	25	463	75
South East (West)	582	139	24	443	76
South West	669	198	30	471	70
West Midlands	657	171	26	486	74
North West	838	205	24	633	76
Wales	469	98	21	371	79
Northern Ireland	135	39	29	96	71
Scotland	672	161	24	511	76
United Kingdom	**7465**	**1830**	**25**	**5635**	**75**

Table 65 : Average number of nodes examined			
Region	Total invasive cancers with known nodal status	Mean number of nodes examined	Median number of nodes examined
Northern	348	9	7
Yorkshire	489	12	11
Trent	661	9	7
Eastern	742	10	9
London	583	13	12
South East (East)	620	10	9
South East (West)	582	10	10
South West	669	12	10
West Midlands	657	10	9
North West	838	11	11
Wales	469	10	9
Northern Ireland	135	17	15
Scotland	672	11	9
United Kingdom	**7465**	**11**	**10**

Table 66 : Status of cases with <4 nodes obtained									
Region	Total with nodal status known	Nodal status determined on basis of <4 nodes		Positive		Negative			
						Sentinel node procedure		Other or unknown procedure	
		No.	%	No.	%	No.	%	No.	%
Northern	348	24	6.9	1	0.3	0	0.0	23	6.6
Yorkshire	489	19	3.9	0	0.0	2	0.4	17	3.5
Trent	661	28	4.2	3	0.5	10	1.5	15	2.3
Eastern	742	52	7.0	9	1.2	4	0.5	39	5.3
London	583	25	4.3	5	0.9	7	1.2	13	2.2
South East (East)	620	31	5.0	5	0.8	10	1.6	16	2.6
South East (West)	582	26	4.5	3	0.5	4	0.7	19	3.3
South West	669	35	5.2	7	1.0	1	0.1	27	4.0
West Midlands	657	38	5.8	5	0.8	7	1.1	26	4.0
North West	838	54	6.4	6	0.7	0	0.0	48	5.7
Wales	469	24	5.1	2	0.4	5	1.1	17	3.6
Northern Ireland	135	1	0.7	0	0.0	0	0.0	1	0.7
Scotland	672	25	3.7	4	0.6	6	0.9	15	2.2
United Kingdom	**7465**	**382**	**5.1**	**50**	**0.7**	**56**	**0.8**	**276**	**3.7**

Table 67 : Availability of lymph node status for non-invasive cancers									
Region	Total non-invasive cancers	Nodal status known		Nodes obtained but status unknown		No nodes obtained		Unknown if nodes obtained	
		No.	%	No.	%	No.	%	No.	%
Northern	85	33	39	0	0	52	61	0	0
Yorkshire	157	40	25	0	0	117	75	0	0
Trent	187	72	39	0	0	115	61	0	0
Eastern	223	28	13	0	0	195	87	0	0
London	197	38	19	0	0	135	69	24	12
South East (East)	188	45	24	0	0	143	76	0	0
South East (West)	164	37	23	0	0	124	76	3	2
South West	201	38	19	0	0	162	81	1	0
West Midlands	161	50	31	0	0	106	66	5	3
North West	225	55	24	0	0	167	74	3	1
Wales	114	34	30	0	0	80	70	0	0
Northern Ireland	45	11	24	0	0	27	60	7	16
Scotland	162	31	19	0	0	131	81	0	0
United Kingdom	**2109**	**512**	**24**	**0**	**0**	**1554**	**74**	**43**	**2**

Table 68 : Nodal status of nodes with status known for non-invasive cancers					
Region	Total known nodal status	Positive		Negative	
		No.	%	No.	%
Northern	33	0	0	33	100
Yorkshire	40	1	3	39	98
Trent	72	0	0	72	100
Eastern	28	1	4	27	96
London	38	3	8	35	92
South East (East)	45	0	0	45	100
South East (West)	37	0	0	37	100
South West	38	0	0	38	100
West Midlands	50	0	0	50	100
North West	55	1	2	54	98
Wales	34	3	9	31	91
Northern Ireland	11	0	0	11	100
Scotland	31	0	0	31	100
United Kingdom	**512**	**9**	**2**	**503**	**98**

Table 69 : Grade of invasive cancers												
Region	Grade I		Grade II		Grade III		Not Assessable		Unknown		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Northern	164	46	129	36	53	15	2	1	9	3	357	100
Yorkshire	169	34	235	47	80	16	2	0	10	2	496	100
Trent	207	31	328	48	136	20	4	1	3	0	678	100
Eastern	245	30	396	49	133	16	18	2	15	2	807	100
London	239	35	274	40	119	18	6	1	39	6	677	100
South East (East)	197	31	317	49	116	18	8	1	6	1	644	100
South East (West)	227	36	269	43	111	18	6	1	16	3	629	100
South West	210	29	356	50	123	17	7	1	19	3	715	100
West Midlands	233	35	309	46	126	19	2	0	3	0	673	100
North West	269	29	458	50	141	15	13	1	42	5	923	100
Wales	181	37	225	47	58	12	6	1	13	3	483	100
Northern Ireland	41	28	81	55	24	16	0	0	2	1	148	100
Scotland	229	34	287	42	139	20	16	2	10	1	681	100
United Kingdom	**2611**	**33**	**3664**	**46**	**1359**	**17**	**90**	**1**	**187**	**2**	**7911**	**100**

Table 70 : Annual screening surgical caseload per surgeon											
Region	Total surgeons	<10 cases		10-19 cases		20-29 cases		30-99 cases		100+ cases	
		No.	%	No.	%	No.	%	No.	%	No.	%
Northern	26	13	50	3	12	3	12	7	27	0	0
Yorkshire	35	12	34	7	20	5	14	11	31	0	0
Trent	31	7	23	4	13	3	10	17	55	0	0
Eastern	45	13	29	8	18	7	16	17	38	0	0
London	61	26	43	16	26	8	13	10	16	1	2
South East (East)	50	19	38	15	30	5	10	10	20	1	2
South East (West)	38	7	18	9	24	9	24	13	34	0	0
South West	38	10	26	4	11	12	32	12	32	0	0
West Midlands	38	6	16	5	13	11	29	16	42	0	0
North West	55	23	42	7	13	6	11	18	33	1	2
Wales	21	7	33	2	10	3	14	9	43	0	0
Northern Ireland	11	2	18	4	36	4	36	1	9	0	0
Scotland	33	13	39	6	18	2	6	10	30	2	6
United Kingdom	**439**	**156**	**36**	**74**	**17**	**72**	**16**	**133**	**30**	**4**	**1**

Notes: The surgeons in each region are credited with their total UK screening caseload. 38 surgeons had cases from more than one region, and appear in each unit's figures. 41 surgeons were identified with a code other than the GMC code. 6 screening units submitted an unknown surgeon code, counted as 6 unique surgeons.

Table 71 : Screening cases per surgeon							
Region	Total surgeons	Mean	Min	1st quartile	Median	3rd quartile	Max
Northern	26	17.7	1	1	10	30	61
Yorkshire	35	23.1	1	5	17	40	82
Trent	31	30.3	1	15	33	39	77
Eastern	45	26.6	1	4	22	43	82
London	61	18.7	1	4	12	26	102
South East (East)	50	21.8	1	4	13	26	102
South East (West)	38	24.4	1	12	23	33	81
South West	38	26.2	1	8	24	40	67
West Midlands	38	27.3	1	19	25	40	65
North West	55	24.6	1	2	13	42	105
Wales	21	31.6	1	4	27	57	82
Northern Ireland	11	17.7	3	13	17	23	38
Scotland	33	25.6	1	4	17	40	137
United Kingdom	**439**	**23.3**	**1**	**4**	**18**	**37**	**137**

Table 72 : Number of surgeons treating each woman								
Region	Total cancers	Number of women treated by…						Total treated
		No surgeon		2 surgeons		3 surgeons		
Northern	452	2	0	10	2	0	0	460
Yorkshire	660	0	0	5	1	0	0	665
Trent	881	10	1	0	0	0	0	871
Eastern	1055	16	2	3	0	0	0	1042
London	890	31	3	0	0	0	0	859
South East (East)	850	5	1	0	0	0	0	845
South East (West)	799	4	1	23	3	1	0	820
South West	937	5	1	7	1	0	0	939
West Midlands	841	1	0	1	0	0	0	841
North West	1170	14	1	62	5	0	0	1218
Wales	609	11	2	10	2	0	0	608
Northern Ireland	194	0	0	1	1	0	0	195
Scotland	853	9	1	0	0	0	0	844
United Kingdom	**10191**	**108**	**1**	**122**	**1**	**1**	**0**	**10207**

Table 73 : Proportion of women treated according to annual caseload of surgeon											
Region	Total treated	<10 cases		10-19 cases		20-29 cases		30-99 cases		100+ cases	
		No.	%	No.	%	No.	%	No.	%	No.	%
Northern	460	26	6	48	10	74	16	312	68	0	0
Yorkshire	665	31	5	82	12	126	19	426	64	0	0
Trent	871	20	2	47	5	63	7	741	85	0	0
Eastern	1042	26	2	101	10	170	16	745	71	0	0
London	859	76	9	186	22	183	21	413	48	1	0
South East (East)	845	59	7	127	15	76	9	482	57	101	12
South East (West)	820	26	3	84	10	217	26	493	60	0	0
South West	939	36	4	54	6	255	27	594	63	0	0
West Midlands	841	15	2	77	9	265	32	484	58	0	0
North West	1218	58	5	89	7	145	12	821	67	105	9
Wales	608	22	4	32	5	57	9	497	82	0	0
Northern Ireland	195	6	3	60	31	91	47	38	19	0	0
Scotland	844	39	5	89	11	47	6	420	50	249	30
United Kingdom	**10207**	**440**	**4**	**1076**	**11**	**1769**	**17**	**6466**	**63**	**456**	**4**

Table 74 : Explanations for surgeons treating less than 10 screening cases in 2000/01										
Region	Total	Other caseload >30 year	Joined NHS BSP	Left NHS BSP	Patient choice	Plastic surgeon	Private practice	Not screening in area	No information	Other
Northern	13	9	3	0	0	0	0	0	0	1
Yorkshire	12	6	1	1	2	0	0	0	2	0
Trent	7	0	0	2	0	0	4	0	1	0
Eastern	13	1	1	2	2	2	2	0	3	0
London	26	6	0	0	0	0	0	1	19	0
South East (East)	19	4	3	2	0	0	0	2	8	0
South East (West)	7	1	1	0	1	2	0	1	1	0
South West	10	2	0	2	0	0	0	0	6	0
West Midlands	6	2	1	0	3	0	0	0	0	0
North West	23	4	4	2	5	0	0	0	8	0
Wales	7	4	0	0	1	1	0	0	1	0
Northern Ireland	2	2	0	0	0	0	0	0	0	0
Scotland	13	4	2	0	2	0	0	0	4	1
United Kingdom	**156**	**45**	**16**	**11**	**16**	**5**	**6**	**3**	**52**	**2**

APPENDIX 6

ADJUVANT THERAPY DATA FROM THE 2000/01 AND 2001/02 AUDITS OF SCREEN DETECTED BREAST CANCERS IN WOMEN OF ALL AGES FOR THE PERIOD 1ST OCTOBER 2000 – 30TH SEPTEMBER 2001

Table 75 : Data provided to the BASO adjuvant audit for main audit cases with DOFOA Oct 2000 to Sept 2001

Region	Total	No adjuvant data supplied		Some adjuvant data but exclude		Include	
		No.	%	No.	%	No.	%
Northern	457	202	44	0	0	255	56
Yorkshire	671	306	46	0	0	365	54
Trent	938	5	1	0	0	933	99
Eastern	943	215	23	48	5	680	72
London	947	276	29	46	5	625	66
South East (East)	810	200	25	0	0	610	75
South East (West)	763	36	5	3	0	724	95
South West	909	115	13	26	3	768	84
West Midlands	834	154	18	8	1	672	81
North West	1138	129	11	19	2	990	87
Wales	477	15	3	2	0	460	96
Northern Ireland	233	32	14	2	1	199	85
Scotland	896	447	50	3	0	446	50
Total	**10016**	**2132**	**21**	**157**	**2**	**7727**	**77**

Exclude cases with incomplete surgery data or with treatment prior to first assessment date

Table 76 : Data completeness of included cases

Region	Total	Complete RT		Complete CT		Complete HT		Complete ER		Included	
		No.	%	No.	%	No.	%	No.	%		
Northern	457	255	56	253	55	210	46	192	42	255	56
Yorkshire	671	344	51	358	53	354	53	317	47	365	54
Trent	938	925	99	928	99	926	99	720	77	933	99
Eastern	943	622	66	655	69	609	65	527	56	680	72
London	947	591	62	612	65	550	58	512	54	625	66
South East (East)	810	520	64	554	68	495	61	456	56	610	75
South East (West)	763	719	94	692	91	616	81	582	76	724	95
South West	909	718	79	683	75	672	74	613	67	768	84
West Midlands	834	641	77	664	80	662	79	590	71	672	81
North West	1138	927	81	962	85	682	60	617	54	990	87
Wales	477	454	95	459	96	450	94	282	59	460	96
Northern Ireland	233	178	76	193	83	171	73	184	79	199	85
Scotland	896	422	47	441	49	337	38	398	44	446	50
United Kingdom	**10016**	**7316**	**73**	**7454**	**74**	**6734**	**67**	**5990**	**60**	**7727**	**77**

Table 77 : Data completeness of included cases (as a proportion of eligible cases)							
Region	Total eligible	RT, CT and HT complete		RT and CT complete		Total included	
		No.	%	No.	%		
Northern	457	208	46	253	55	255	56
Yorkshire	671	332	49	337	50	365	54
Trent	938	917	98	921	98	933	99
Eastern	943	560	59	605	64	680	72
London	947	525	55	581	61	625	66
South East (East)	810	425	52	484	60	610	75
South East (West)	763	604	79	688	90	724	95
South West	909	580	64	657	72	768	84
West Midlands	834	632	76	638	76	672	81
North West	1138	631	55	907	80	990	87
Wales	477	444	93	454	95	460	96
Northern Ireland	233	153	66	172	74	199	85
Scotland	896	324	36	418	47	446	50
United Kingdom	**10016**	**6335**	**63**	**7115**	**71**	**7727**	**77**

Table 78 : Surgery								
Region	No surgery		1 operation		>1 operation		Total	
	No	%	No	%	No	%	No	%
Northern	2	1	182	71	71	28	255	100
Yorkshire	1	0	283	78	81	22	365	100
Trent	13	1	746	80	174	19	933	100
Eastern	5	1	513	75	162	24	680	100
London	1	0	512	82	112	18	625	100
South East (East)	8	1	469	77	133	22	610	100
South East (West)	3	0	591	82	130	18	724	100
South West	6	1	581	76	181	24	768	100
West Midlands	1	0	532	79	139	21	672	100
North West	12	1	774	78	204	21	990	100
Wales	4	1	355	77	101	22	460	100
Northern Ireland	0	0	147	74	52	26	199	100
Scotland	0	0	347	78	99	22	446	100
United Kingdom	**56**	**1**	**6032**	**78**	**1639**	**21**	**7727**	**100**

Operations can be either diagnostic or therapeutic

Table 79 : Radiotherapy start date						
Region	Start date before 30/06/02		No radiotherapy before 30/06/02		Total	
	No	%	No	%	No	%
Northern	198	78	55	22	253	100
Yorkshire	218	65	119	35	337	100
Trent	534	58	387	42	921	100
Eastern	398	66	207	34	605	100
London	402	69	179	31	581	100
South East (East)	278	57	206	43	484	100
South East (West)	461	67	227	33	688	100
South West	429	65	228	35	657	100
West Midlands	453	71	185	29	638	100
North West	547	60	360	40	907	100
Wales	280	62	174	38	454	100
Northern Ireland	129	75	43	25	172	100
Scotland	287	69	131	31	418	100
United Kingdom	**4614**	**65**	**2501**	**35**	**7115**	**100**

Table 80 : Chemotherapy start date						
	Start date before 30/06/02		No chemotherapy before 30/06/02		Total	
Region	No	%	No	%	No	%
Northern	38	15	215	85	253	100
Yorkshire	46	14	291	86	337	100
Trent	145	16	776	84	921	100
Eastern	112	19	493	81	605	100
London	91	16	490	84	581	100
South East (East)	86	18	398	82	484	100
South East (West)	115	17	573	83	688	100
South West	120	18	537	82	657	100
West Midlands	119	19	519	81	638	100
North West	158	17	749	83	907	100
Wales	70	15	384	85	454	100
Northern Ireland	54	31	118	69	172	100
Scotland	100	24	318	76	418	100
United Kingdom	**1254**	**18**	**5861**	**82**	**7115**	**100**

Table 81 : Hormonal therapy start date						
	Start date before 30/06/02		No hormonal therapy before 30/06/02		Total	
Region	No	%	No	%	No	%
Northern	161	77	49	23	210	100
Yorkshire	255	72	99	28	354	100
Trent	620	67	306	33	926	100
Eastern	455	75	154	25	609	100
London	357	65	193	35	550	100
South East (East)	397	80	98	20	495	100
South East (West)	481	78	135	22	616	100
South West	520	77	152	23	672	100
West Midlands	521	79	141	21	662	100
North West	546	80	136	20	682	100
Wales	314	70	136	30	450	100
Northern Ireland	137	80	34	20	171	100
Scotland	240	71	97	29	337	100
United Kingdom	**5004**	**74**	**1730**	**26**	**6734**	**100**

Table 82 : ER status of cases with complete hormonal therapy data						
	ER Positive		ER Negative		Total	
Region	No	%	No	%	No	%
Northern	163	85	29	15	192	100
Yorkshire	255	80	62	20	317	100
Trent	636	88	84	12	720	100
Eastern	470	89	57	11	527	100
London	440	86	72	14	512	100
South East (East)	404	89	52	11	456	100
South East (West)	495	85	87	15	582	100
South West	539	88	74	12	613	100
West Midlands	502	85	88	15	590	100
North West	529	86	88	14	617	100
Wales	267	95	15	5	282	100
Northern Ireland	151	82	33	18	184	100
Scotland	349	88	49	12	398	100
United Kingdom	**5200**	**87**	**790**	**13**	**5990**	**100**

Table 83 : Time from assessment to first surgery											
	Total	≤14 days		≤30 days		≤60 days		≤90 days		≤120 days	
Region		No	%	No	%	No	%	No	%	No	%
Northern	253	56	22	195	77	244	96	252	100	252	100
Yorkshire	364	47	13	253	70	349	96	359	99	362	99
Trent	920	98	11	589	64	870	95	899	98	900	98
Eastern	675	94	14	444	66	622	92	649	96	657	97
London	624	58	9	272	44	537	86	602	96	613	98
South East (East)	602	24	4	221	37	493	82	566	94	587	98
South East (West)	721	116	16	510	71	690	96	708	98	714	99
South West	762	78	10	414	54	718	94	751	99	753	99
West Midlands	671	144	21	512	76	633	94	664	99	668	100
North West	978	145	15	553	57	908	93	962	98	969	99
Wales	456	77	17	347	76	450	99	455	100	456	100
Northern Ireland	199	97	49	184	92	197	99	197	99	198	99
Scotland	446	95	21	331	74	419	94	433	97	438	98
United Kingdom	**7671**	**1129**	**15**	**4825**	**63**	**7130**	**93**	**7497**	**98**	**7567**	**99**

Table 84 : Time from first surgery to final surgery											
	Total	≤14 days		≤30 days		≤60 days		≤90 days		≤120 days	
Region		No	%	No	%	No	%	No	%	No	%
Northern	71	7	10	38	54	67	94	68	96	68	96
Yorkshire	81	9	11	48	59	74	91	80	99	80	99
Trent	174	15	9	83	48	150	86	165	95	172	99
Eastern	162	19	12	100	62	153	94	158	98	160	99
London	112	8	7	41	37	97	87	105	94	111	99
South East (East)	133	10	8	47	35	111	83	129	97	130	98
South East (West)	130	14	11	58	45	118	91	126	97	127	98
South West	181	32	18	101	56	162	90	175	97	177	98
West Midlands	139	15	11	80	58	122	88	134	96	137	99
North West	204	11	5	87	43	180	88	196	96	201	99
Wales	101	27	27	77	76	97	96	100	99	100	99
Northern Ireland	52	11	21	42	81	48	92	50	96	50	96
Scotland	99	17	17	59	60	91	92	94	95	96	97
United Kingdom	**1639**	**195**	**12**	**861**	**53**	**1470**	**90**	**1580**	**96**	**1609**	**98**

Table 85 : Time from first surgery to radiotherapy															
Region	Total	Exclusions			Total minus exclusions	≤14 days		≤30 days		≤60 days		≤90 days		≤120 days	
		No surgery	CT between RT and first surgery	RT before first surgery		No	%	No	%	No	%	No	%	No	%
Northern	198	1	28	0	169	0	0	1	1	35	21	81	48	136	80
Yorkshire	218	0	36	0	182	0	0	4	2	65	36	113	62	142	78
Trent	534	0	96	0	438	1	0	10	2	213	49	361	82	412	94
Eastern	398	0	84	5	309	1	0	12	4	110	36	197	64	261	84
London	402	0	69	3	330	8	2	24	7	73	22	180	55	251	76
South East (East)	278	2	62	4	210	0	0	0	0	23	11	89	42	144	69
South East (West)	461	1	86	1	373	0	0	4	1	71	19	175	47	287	77
South West	429	0	79	2	348	4	1	32	9	163	47	295	85	331	95
West Midlands	453	0	99	0	354	1	0	15	4	138	39	252	71	323	91
North West	547	5	111	1	430	6	1	11	3	73	17	236	55	330	77
Wales	280	0	50	0	230	0	0	4	2	81	35	164	71	215	93
Northern Ireland	129	0	27	0	102	8	8	9	9	23	23	70	69	98	96
Scotland	287	0	69	4	214	1	0	7	3	100	47	169	79	198	93
United Kingdom	**4614**	**9**	**896**	**20**	**3689**	**30**	**1**	**133**	**4**	**1168**	**32**	**2382**	**65**	**3128**	**85**

Table 86 : Time from final surgery to radiotherapy															
Region	Total	Exclusions			Total minus exclusions	≤14 days		≤30 days		≤60 days		≤90 days		≤120 days	
		No surgery	CT between RT and final surgery	RT before final surgery		No	%	No	%	No	%	No	%	No	%
Northern	198	1	26	0	171	0	0	1	1	42	25	99	58	152	89
Yorkshire	218	0	36	0	182	0	0	5	3	78	43	120	66	146	80
Trent	534	0	95	0	439	1	0	12	3	253	58	393	90	421	96
Eastern	398	0	84	7	307	3	1	21	7	123	40	214	70	271	88
London	402	0	68	3	331	9	3	24	7	79	24	199	60	263	79
South East (East)	278	2	61	4	211	0	0	2	1	27	13	104	49	160	76
South East (West)	461	1	84	1	375	0	0	5	1	84	22	195	52	311	83
South West	429	0	78	2	349	4	1	50	14	193	55	312	89	337	97
West Midlands	453	0	99	0	354	2	1	19	5	159	45	274	77	332	94
North West	547	5	111	3	428	5	1	10	2	81	19	257	60	349	82
Wales	280	0	50	0	230	0	0	5	2	93	40	176	77	222	97
Northern Ireland	129	0	26	1	102	9	9	12	12	27	26	75	74	99	97
Scotland	287	0	69	6	212	1	0	8	4	118	56	182	86	198	93
United Kingdom	**4614**	**9**	**887**	**27**	**3691**	**34**	**1**	**174**	**5**	**1357**	**37**	**2600**	**70**	**3261**	**88**

Table 87 : Time from first surgery to chemotherapy															
Region	Total	Exclusions			Total minus exclusions	≤14 days		≤30 days		≤60 days		≤90 days		≤120 days	
		No surgery	RT between CT and first surgery	CT before first surgery		No	%	No	%	No	%	No	%	No	%
Northern	38	0	0	1	37	0	0	2	5	20	54	35	95	36	97
Yorkshire	46	0	0	1	45	1	2	9	20	34	76	40	89	44	98
Trent	145	1	2	13	129	2	2	38	29	112	87	123	95	127	98
Eastern	112	0	2	6	104	2	2	35	34	81	78	100	96	102	98
London	91	0	2	6	83	3	4	22	27	60	72	72	87	77	93
South East (East)	86	3	4	2	77	0	0	12	16	51	66	68	88	76	99
South East (West)	115	3	5	3	104	0	0	35	34	89	86	100	96	102	98
South West	120	3	5	5	107	0	0	18	17	77	72	103	96	106	99
West Midlands	119	0	1	0	118	2	2	22	19	100	85	111	94	115	97
North West	158	2	2	3	151	4	3	44	29	118	78	140	93	145	96
Wales	70	0	2	2	66	0	0	17	26	51	77	64	97	66	100
Northern Ireland	54	0	21	1	32	1	3	14	44	30	94	32	100	32	100
Scotland	100	0	3	5	92	0	0	31	34	80	87	87	95	89	97
United Kingdom	**1254**	**12**	**49**	**48**	**1145**	**15**	**1**	**299**	**26**	**903**	**79**	**1075**	**94**	**1117**	**98**

Table 88 : Time from final surgery to chemotherapy															
Region	Total	Exclusions			Total minus exclusions	≤14 days		≤30 days		≤60 days		≤90 days		≤120 days	
		No surgery	RT between CT and final surgery	CT before final surgery		No	%	No	%	No	%	No	%	No	%
Northern	38	0	0	3	35	0	0	3	9	25	71	34	97	34	97
Yorkshire	46	0	0	1	45	1	2	13	29	37	82	40	89	44	98
Trent	145	1	2	14	128	2	2	42	33	119	93	125	98	126	98
Eastern	112	0	2	7	103	2	2	44	43	93	90	100	97	103	100
London	91	0	2	7	82	4	5	30	37	67	82	74	90	76	93
South East (East)	86	3	4	3	76	0	0	11	14	59	78	72	95	75	99
South East (West)	115	3	5	6	101	0	0	37	37	91	90	98	97	100	99
South West	120	3	5	6	106	1	1	25	24	85	80	102	96	105	99
West Midlands	119	0	1	0	118	3	3	27	23	106	90	113	96	115	97
North West	158	2	2	5	149	4	3	53	36	132	89	142	95	144	97
Wales	70	0	2	2	66	0	0	18	27	56	85	65	98	66	100
Northern Ireland	54	0	22	1	31	3	10	18	58	29	94	31	100	31	100
Scotland	100	0	3	5	92	0	0	35	38	85	92	88	96	90	98
United Kingdom	**1254**	**12**	**50**	**60**	**1132**	**20**	**2**	**356**	**31**	**984**	**87**	**1084**	**96**	**1109**	**98**

Table 89 : Time from first surgery to hormonal therapy															
Region	Total	No surgery	HT before first surgery		Total minus exclusions	≤14 days		≤30 days		≤60 days		≤90 days		≤120 days	
			No.	%		No	%	No	%	No	%	No	%	No	%
Northern	161	0	0	0	161	57	35	87	54	127	79	132	82	137	85
Yorkshire	255	1	10	4	244	92	38	160	66	208	85	214	88	218	89
Trent	620	10	83	13	527	171	32	383	73	447	85	467	89	485	92
Eastern	455	2	34	7	419	177	42	273	65	345	82	356	85	370	88
London	357	1	22	6	334	92	28	182	54	233	70	252	75	271	81
South East (East)	397	4	103	26	290	141	49	193	67	249	86	264	91	268	92
South East (West)	481	0	9	2	472	158	33	317	67	394	83	422	89	434	92
South West	520	1	152	29	367	140	38	233	63	310	84	333	91	337	92
West Midlands	521	0	121	23	400	202	51	289	72	344	86	356	89	361	90
North West	546	5	16	3	525	204	39	355	68	456	87	479	91	485	92
Wales	314	2	24	8	288	125	43	194	67	242	84	256	89	260	90
Northern Ireland	137	0	0	0	137	40	29	83	61	107	78	113	82	122	89
Scotland	240	0	5	2	235	66	28	136	58	174	74	182	77	186	79
United Kingdom	**5004**	**26**	**579**	**12**	**4399**	**1665**	**38**	**2885**	**66**	**3636**	**83**	**3826**	**87**	**3934**	**89**

Table 90 : Order of surgery, radiotherapy and chemotherapy treatments												
Region	Total	Surgery to RT		Surgery only		Surgery to CT to RT		Surgery to CT		Surgery to RT to CT		Other	
		No	%	No	%	No	%	No	%	No	%	No	%
Northern	253	168	66	45	18	26	10	9	4	0	0	5	2
Yorkshire	337	181	54	110	33	36	11	9	3	0	0	1	0
Trent	921	430	47	335	36	95	10	33	4	2	0	26	3
Eastern	605	300	50	181	30	84	14	19	3	2	0	19	3
London	581	323	56	164	28	68	12	14	2	1	0	11	2
South East (East)	484	206	43	189	39	61	13	12	2	3	1	13	3
South East (West)	688	365	53	207	30	84	12	17	2	5	1	10	1
South West	657	340	52	193	29	78	12	26	4	5	1	15	2
West Midlands	638	353	55	165	26	99	16	19	3	1	0	1	0
North West	907	425	47	313	35	111	12	38	4	2	0	18	2
Wales	454	227	50	154	34	50	11	16	4	2	0	5	1
Northern Ireland	172	80	47	38	22	26	15	5	3	21	12	2	1
Scotland	418	205	49	109	26	69	17	22	5	2	0	11	3
United Kingdom	**7115**	**3603**	**51**	**2203**	**31**	**887**	**12**	**239**	**3**	**46**	**1**	**137**	**2**

Table 91 : Median time (in days) from assessment to final therapy (final surgery, RT or CT)										
Region	All cases		Surgery to RT		Surgery only		Surgery to CT to RT		Surgery to CT	
	Total cases	Median	Total cases	Median	Total cases	Median	Total cases	Median	Total cases	Median
Northern	253	108	168	114	45	23	26	204	9	83
Yorkshire	337	90	181	106	110	31	36	211	9	108
Trent	921	76	430	89	335	32	95	183	33	62
Eastern	605	90	300	103	181	38	84	218	19	80
London	581	108	323	119	164	48	68	232	14	88
South East (East)	484	115	206	139	189	48	61	231	12	116
South East (West)	688	104	365	123	207	35	84	188	17	73
South West	657	84	340	92	193	39	78	201	26	94
West Midlands	638	89	353	95	165	36	99	224	19	62
North West	907	95	425	115	313	42	111	231	38	67
Wales	454	81	227	97	154	26	50	217	16	80
Northern Ireland	172	49	80	103	38	21	26	148	5	42
Scotland	418	83	205	90	109	30	69	167	22	70
United Kingdom	**7115**	**91**	**3603**	**104**	**2203**	**36**	**887**	**210**	**239**	**75**

Table 92 : Treatment of cancers with known radiotherapy data										
Region	Conservation surgery		Mastectomy		No Surgery		Unknown		Total	
	No	%	No	%	No	%	No	%	No	%
Northern	202	79	51	20	1	0	1	0	255	100
Yorkshire	234	68	110	32	0	0	0	0	344	100
Trent	583	63	329	36	13	1	0	0	925	100
Eastern	442	71	174	28	6	1	0	0	622	100
London	473	80	107	18	6	1	5	1	591	100
South East (East)	366	70	149	29	5	1	0	0	520	100
South East (West)	554	77	160	22	3	0	2	0	719	100
South West	550	77	159	22	9	1	0	0	718	100
West Midlands	471	73	169	26	0	0	1	0	641	100
North West	635	69	277	30	8	1	7	1	927	100
Wales	290	64	159	35	5	1	0	0	454	100
Northern Ireland	137	77	41	23	0	0	0	0	178	100
Scotland	280	66	127	30	1	0	14	3	422	100
United Kingdom	**5217**	**71**	**2012**	**28**	**57**	**1**	**30**	**0**	**7316**	**100**

Table 93 : Radiotherapy for cancers treated by conservation surgery						
	Start date before 30/06/02		No radiotherapy before 30/06/02		Total	
Region	No	%	No	%	No	%
Northern	181	90	21	10	202	100
Yorkshire	188	80	46	20	234	100
Trent	461	79	122	21	583	100
Eastern	359	81	83	19	442	100
London	378	80	95	20	473	100
South East (East)	281	77	85	23	366	100
South East (West)	427	77	127	23	554	100
South West	440	80	110	20	550	100
West Midlands	406	86	65	14	471	100
North West	499	79	136	21	635	100
Wales	252	87	38	13	290	100
Northern Ireland	113	82	24	18	137	100
Scotland	245	88	35	13	280	100
United Kingdom	**4230**	**81**	**987**	**19**	**5217**	**100**

Table 94 : Invasive status for conservatively treated cancers with known radiotherapy data										
	Invasive		Micro-invasive		Non-invasive		Unknown		Total	
Region	No	%	No	%	No	%	No	%	No	%
Northern	167	83	4	2	30	15	1	0	202	100
Yorkshire	190	81	0	0	43	18	1	0	234	100
Trent	443	76	9	2	130	22	1	0	583	100
Eastern	340	77	8	2	94	21	0	0	442	100
London	377	80	2	0	94	20	0	0	473	100
South East (East)	295	81	6	2	65	18	0	0	366	100
South East (West)	449	81	4	1	101	18	0	0	554	100
South West	436	79	4	1	110	20	0	0	550	100
West Midlands	391	83	1	0	79	17	0	0	471	100
North West	505	80	7	1	123	19	0	0	635	100
Wales	235	81	2	1	53	18	0	0	290	100
Northern Ireland	114	83	0	0	23	17	0	0	137	100
Scotland	211	75	4	1	65	23	0	0	280	100
United Kingdom	**4153**	**80**	**51**	**1**	**1010**	**19**	**3**	**0**	**5217**	**100**

Table 95 : Radiotherapy for invasive cancers treated by conservation surgery						
	Start date before 30/06/02		No radiotherapy before 30/06/02		Total	
Region	No	%	No	%	No	%
Northern	156	93	11	7	167	100
Yorkshire	169	89	21	11	190	100
Trent	397	90	46	10	443	100
Eastern	312	92	28	8	340	100
London	333	88	44	12	377	100
South East (East)	254	86	41	14	295	100
South East (West)	388	86	61	14	449	100
South West	386	89	50	11	436	100
West Midlands	364	93	27	7	391	100
North West	436	86	69	14	505	100
Wales	226	96	9	4	235	100
Northern Ireland	104	91	10	9	114	100
Scotland	197	93	14	7	211	100
United Kingdom	**3722**	**90**	**431**	**10**	**4153**	**100**

Table 96 : Radiotherapy for non-invasive cancers treated by conservation surgery						
	Start date before 30/06/02		No radiotherapy before 30/06/02		Total	
Region	No	%	No	%	No	%
Northern	20	67	10	33	30	100
Yorkshire	18	42	25	58	43	100
Trent	57	44	73	56	130	100
Eastern	41	44	53	56	94	100
London	44	47	50	53	94	100
South East (East)	22	34	43	66	65	100
South East (West)	36	36	65	64	101	100
South West	52	47	58	53	110	100
West Midlands	41	52	38	48	79	100
North West	59	48	64	52	123	100
Wales	25	47	28	53	53	100
Northern Ireland	9	39	14	61	23	100
Scotland	44	68	21	32	65	100
United Kingdom	**468**	**46**	**542**	**54**	**1010**	**100**

Table 97 : Invasive status, nodal status and ER status of invasive cancers with known chemotherapy data														
	Invasive						Micro-invasive		Non-invasive		Invasive status unknown		Total	
	ER Negative Node Negative		ER Negative Node Positive		Other									
Region	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Northern	15	6	5	2	188	74	4	2	39	15	2	1	253	100
Yorkshire	21	6	14	4	251	70	4	1	67	19	1	0	358	100
Trent	53	6	19	2	633	68	15	2	205	22	3	0	928	100
Eastern	31	5	16	2	469	72	9	1	124	19	6	1	655	100
London	32	5	16	3	440	72	3	0	120	20	1	0	612	100
South East (East)	25	5	10	2	389	70	8	1	121	22	1	0	554	100
South East (West)	49	7	16	2	495	72	5	1	127	18	0	0	692	100
South West	28	4	20	3	480	70	10	1	141	21	4	1	683	100
West Midlands	44	7	17	3	490	74	2	0	111	17	0	0	664	100
North West	42	4	19	2	707	73	12	1	180	19	2	0	962	100
Wales	11	2	4	1	345	75	8	2	91	20	0	0	459	100
Northern Ireland	22	11	5	3	138	72		0	28	15	0	0	193	100
Scotland	28	6	9	2	304	69	8	2	92	21	0	0	441	100
United Kingdom	**401**	**5**	**170**	**2**	**5329**	**71**	**88**	**1**	**1446**	**19**	**20**	**0**	**7454**	**100**

Table 98 : Chemotherapy for ER negative node positive invasive cancers						
	Start date before 30/06/02		No chemotherapy before 30/06/02		Total	
Region	No	%	No	%	No	%
Northern	4	80	1	20	5	100
Yorkshire	11	79	3	21	14	100
Trent	14	74	5	26	19	100
Eastern	14	88	2	13	16	100
London	13	81	3	19	16	100
South East (East)	9	90	1	10	10	100
South East (West)	13	81	3	19	16	100
South West	19	95	1	5	20	100
West Midlands	16	94	1	6	17	100
North West	14	74	5	26	19	100
Wales	3	75	1	25	4	100
Northern Ireland	4	80	1	20	5	100
Scotland	9	100	0	0	9	100
United Kingdom	**143**	**84**	**27**	**16**	**170**	**100**

Table 99 : Chemotherapy for ER negative node negative invasive cancers						
	Start date before 30/06/02		No chemotherapy before 30/06/02		Total	
Region	No	%	No	%	No	%
Northern	6	40	9	60	15	100
Yorkshire	6	29	15	71	21	100
Trent	30	57	23	43	53	100
Eastern	14	45	17	55	31	100
London	5	16	27	84	32	100
South East (East)	13	52	12	48	25	100
South East (West)	19	39	30	61	49	100
South West	11	39	17	61	28	100
West Midlands	22	50	22	50	44	100
North West	20	48	22	52	42	100
Wales	6	55	5	45	11	100
Northern Ireland	16	73	6	27	22	100
Scotland	18	64	10	36	28	100
United Kingdom	**186**	**46**	**215**	**54**	**401**	**100**

Table 100 : Invasive status of cases with known hormonal therapy data										
	Invasive		Micro-invasive		Non-invasive		Unknown		Total	
Region	No	%	No	%	No	%	No	%	No	%
Northern	176	84	2	1	31	15	1	0	210	100
Yorkshire	283	80	4	1	66	19	1	0	354	100
Trent	703	76	15	2	205	22	3	0	926	100
Eastern	485	80	8	1	110	18	6	1	609	100
London	442	80	2	0	105	19	1	0	550	100
South East (East)	393	79	6	1	95	19	1	0	495	100
South East (West)	502	81	4	1	110	18	0	0	616	100
South West	531	79	10	1	129	19	2	0	672	100
West Midlands	552	83	2	0	108	16	0	0	662	100
North West	541	79	8	1	131	19	2	0	682	100
Wales	355	79	7	2	88	20	0	0	450	100
Northern Ireland	145	85	0	0	26	15	0	0	171	100
Scotland	261	77	7	2	69	20	0	0	337	100
United Kingdom	**5369**	**80**	**75**	**1**	**1273**	**19**	**17**	**0**	**6734**	**100**

Table 101 : ER status of cases with complete hormonal therapy data								
	ER Positive		ER Negative		Unknown		Total	
Region	No	%	No	%	No	%	No	%
Northern	133	63	27	13	50	24	210	100
Yorkshire	248	70	61	17	45	13	354	100
Trent	633	68	84	9	209	23	926	100
Eastern	430	71	55	9	124	20	609	100
London	402	73	69	13	79	14	550	100
South East (East)	349	71	47	9	99	20	495	100
South East (West)	444	72	82	13	90	15	616	100
South West	485	72	67	10	120	18	672	100
West Midlands	498	75	88	13	76	11	662	100
North West	494	72	83	12	105	15	682	100
Wales	262	58	15	3	173	38	450	100
Northern Ireland	134	78	23	13	14	8	171	100
Scotland	254	75	36	11	47	14	337	100
United Kingdom	**4766**	**71**	**737**	**11**	**1231**	**18**	**6734**	**100**

Table 102 : Invasive status of ER positive cases										
	Invasive		Micro-invasive		Non-invasive		Unknown		Total	
Region	No	%	No	%	No	%	No	%	No	%
Northern	117	88	2	2	14	11	0	0	133	100
Yorkshire	238	96	1	0	9	4	0	0	248	100
Trent	574	91	8	1	51	8	0	0	633	100
Eastern	405	94	0	0	21	5	4	1	430	100
London	360	90	1	0	41	10	0	0	402	100
South East (East)	307	88	3	1	38	11	1	0	349	100
South East (West)	412	93	1	0	31	7	0	0	444	100
South West	454	94	1	0	29	6	1	0	485	100
West Midlands	477	96	0	0	21	4	0	0	498	100
North West	430	87	6	1	57	12	1	0	494	100
Wales	259	99	1	0	2	1	0	0	262	100
Northern Ireland	123	92	0	0	11	8	0	0	134	100
Scotland	231	91	2	1	21	8	0	0	254	100
United Kingdom	**4387**	**92**	**26**	**1**	**346**	**7**	**7**	**0**	**4766**	**100**

Table 103 : Invasive status of ER negative cases										
	Invasive		Micro-invasive		Non-invasive		Unknown		Total	
Region	No	%	No	%	No	%	No	%	No	%
Northern	20	74	0	0	7	26	0	0	27	100
Yorkshire	37	61	2	3	21	34	1	2	61	100
Trent	72	86	3	4	8	10	1	1	84	100
Eastern	49	89	2	4	3	5	1	2	55	100
London	53	77	0	0	16	23	0	0	69	100
South East (East)	39	83	1	2	7	15	0	0	47	100
South East (West)	64	78	2	2	16	20	0	0	82	100
South West	52	78	3	4	11	16	1	1	67	100
West Midlands	65	74	1	1	22	25	0	0	88	100
North West	67	81	2	2	13	16	1	1	83	100
Wales	15	100	0	0	0	0	0	0	15	100
Northern Ireland	20	87	0	0	3	13	0	0	23	100
Scotland	28	78	2	6	6	17	0	0	36	100
United Kingdom	**581**	**79**	**18**	**2**	**133**	**18**	**5**	**1**	**737**	**100**

Table 104 : Proportion of cases with ER status unknown according to invasive status								
	Invasive		Micro-invasive		Non-invasive		Total cancers	
Region	Total	% with ER status unknown	Total	% with ER status unknown	Total	% with ER status unknown	Total	% with ER status unknown
Northern	39	22	0	0	10	32	50	24
Yorkshire	8	3	1	25	36	55	45	13
Trent	57	8	4	27	146	71	209	23
Eastern	31	6	6	75	86	78	124	20
London	29	7	1	50	48	46	79	14
South East (East)	47	12	2	33	50	53	99	20
South East (West)	26	5	1	25	63	57	90	15
South West	25	5	6	60	89	69	120	18
West Midlands	10	2	1	50	65	60	76	11
North West	44	8	0	0	61	47	105	15
Wales	81	23	6	86	86	98	173	38
Northern Ireland	2	1	0	-	12	46	14	8
Scotland	2	1	3	43	42	61	47	14
United Kingdom	**401**	**7**	**31**	**41**	**794**	**62**	**1231**	**18**

Table 105 : Hormonal therapy for ER positive cancers						
	Start date before 30/06/02		No hormonal therapy before 30/06/02		Total	
Region	No	%	No	%	No	%
Northern	116	87	17	13	133	100
Yorkshire	237	96	11	4	248	100
Trent	557	88	76	12	633	100
Eastern	402	93	28	7	430	100
London	325	81	77	19	402	100
South East (East)	329	94	20	6	349	100
South East (West)	426	96	18	4	444	100
South West	452	93	33	7	485	100
West Midlands	480	96	18	4	498	100
North West	469	95	25	5	494	100
Wales	224	85	38	15	262	100
Northern Ireland	126	94	8	6	134	100
Scotland	235	93	19	7	254	100
United Kingdom	**4378**	**92**	**388**	**8**	**4766**	**100**

Table 106 : Hormonal therapy for ER positive invasive cancers						
	Start date before 30/06/02		No hormonal therapy before 30/06/02		Total	
Region	No	%	No	%	No	%
Northern	102	87	15	13	117	100
Yorkshire	232	97	6	3	238	100
Trent	506	88	68	12	574	100
Eastern	386	95	19	5	405	100
London	299	83	61	17	360	100
South East (East)	298	97	9	3	307	100
South East (West)	400	97	12	3	412	100
South West	443	98	11	2	454	100
West Midlands	466	98	11	2	477	100
North West	415	97	15	3	430	100
Wales	221	85	38	15	259	100
Northern Ireland	115	93	8	7	123	100
Scotland	223	97	8	3	231	100
United Kingdom	**4106**	**94**	**281**	**6**	**4387**	**100**

Table 107 : Hormonal therapy for ER positive non-invasive cancers						
	Start date before 30/06/02		No hormonal therapy before 30/06/02		Total	
Region	No	%	No	%	No	%
Northern	12	86	2	14	14	100
Yorkshire	4	44	5	56	9	100
Trent	44	86	7	14	51	100
Eastern	13	62	8	38	21	100
London	25	61	16	39	41	100
South East (East)	28	74	10	26	38	100
South East (West)	25	81	6	19	31	100
South West	8	28	21	72	29	100
West Midlands	14	67	7	33	21	100
North West	47	82	10	18	57	100
Wales	2	100	0	0	2	100
Northern Ireland	11	100	0	0	11	100
Scotland	10	48	11	52	21	100
United Kingdom	**243**	**70**	**103**	**30**	**346**	**100**

Table 108 : Hormonal therapy for ER negative cancers						
	Start date before 30/06/02		No hormonal therapy before 30/06/02		Total	
Region	No	%	No	%	No	%
Northern	5	19	22	81	27	100
Yorkshire	11	18	50	82	61	100
Trent	2	2	82	98	84	100
Eastern	16	29	39	71	55	100
London	7	10	62	90	69	100
South East (East)	15	32	32	68	47	100
South East (West)	15	18	67	82	82	100
South West	19	28	48	72	67	100
West Midlands	18	20	70	80	88	100
North West	14	17	69	83	83	100
Wales	5	33	10	67	15	100
Northern Ireland	1	4	22	96	23	100
Scotland	1	3	35	97	36	100
United Kingdom	**129**	**18**	**608**	**82**	**737**	**100**

Table 109 : Hormonal therapy for cancers with ER Status unknown						
	Start date before 30/06/02		No hormonal therapy before 30/06/02		Total	
Region	No	%	No	%	No	%
Northern	40	80	10	20	50	100
Yorkshire	7	16	38	84	45	100
Trent	61	29	148	71	209	100
Eastern	37	30	87	70	124	100
London	25	32	54	68	79	100
South East (East)	53	54	46	46	99	100
South East (West)	40	44	50	56	90	100
South West	49	41	71	59	120	100
West Midlands	23	30	53	70	76	100
North West	63	60	42	40	105	100
Wales	85	49	88	51	173	100
Northern Ireland	10	71	4	29	14	100
Scotland	4	9	43	91	47	100
United Kingdom	**497**	**40**	**734**	**60**	**1231**	**100**

APPENDIX 7

DATA OBTAINED FROM THE SURVIVAL AUDIT OF SCREEN DETECTED BREAST CANCERS FOR CANCERS DIAGNOSED BETWEEN 1ST APRIL 1996 – 31ST MARCH 1997

Table 110 : Invasive status of screen detected breast cancers diagnosed 1996-97									
Region	Invasive		Micro-invasive		Non-invasive		Unknown		Total
	No.	%	No.	%	No.	%	No.	%	
Northern	367	81	9	2	75	16	4	1	455
Yorkshire	328	82	10	2	61	15	2	0	401
Trent	461	78	3	1	124	21	0	0	588
Eastern	571	78	26	4	133	18	4	1	734
London	549	77	14	2	89	13	59	8	711
South East (East)	529	80	5	1	124	19	4	1	662
South East (West)	506	78	9	1	123	19	9	1	647
South West	516	81	7	1	73	11	44	7	640
West Midlands	441	80	8	1	100	18	3	1	552
North West	563	77	35	5	116	16	13	2	727
Wales	291	77	11	3	75	20	2	1	379
Northern Ireland	109	74	7	5	25	17	7	5	148
Scotland	447	77	10	2	103	18	17	3	577
United Kingdom	**5678**	**79**	**154**	**2**	**1221**	**17**	**168**	**2**	**7221**

Table 111 : Eligible cancers included in survival analysis								
Region	Total submitted	Unknown invasive status	Non-Registered		Unknown diagnosis date	< 45 years	> 75 years	Eligible cases
			No.	%				
Northern	455	4	59	13.0	0	11	0	381
Yorkshire	401	2	9	2.2	0	5	1	384
Trent	588	0	48	8.2	0	0	4	536
Eastern	734	4	23	3.1	0	2	3	702
London	711	59	7	1.0	0	4	5	636
South East (East)	662	4	13	2.0	0	1	11	633
South East (West)	647	9	0	0.0	0	2	3	633
South West	640	44	31	4.8	0	3	3	559
West Midlands	552	3	0	0.0	0	0	3	546
North West	727	13	11	1.5	0	4	4	695
Wales	379	2	18	4.7	0	3	4	352
Northern Ireland	148	7	0	0.0	0	0	0	141
Scotland	577	17	0	0.0	0	0	1	559
United Kingdom	**7221**	**168**	**219**	**3.0**	**0**	**35**	**42**	**6757**

Table 112 : Eligible invasive cancers							
Region	Total submitted	Non-Registered		Unknown diagnosis date	< 45 years	> 75 years	Eligible cases
		No.	%				
Northern	367	49	13.4	0	8	0	310
Yorkshire	328	8	2.4	0	5	0	315
Trent	461	36	7.8	0	0	4	421
Eastern	571	14	2.5	0	2	3	552
London	549	5	0.9	0	4	5	535
South East (East)	529	8	1.5	0	1	10	510
South East (West)	506	0	0.0	0	1	3	502
South West	516	27	5.2	0	2	3	484
West Midlands	441	0	0.0	0	0	3	438
North West	563	9	1.6	0	3	2	549
Wales	291	12	4.1	0	1	4	274
Northern Ireland	109	0	0.0	0	0	0	109
Scotland	447	0	0.0	0	0	1	446
United Kingdom	**5678**	**168**	**3.0**	**0**	**27**	**38**	**5445**

Table 113 : Eligible micro-invasive cancers							
Region	Total submitted	Non-Registered		Unknown diagnosis date	< 45 years	> 75 years	Eligible cases
		No.	%				
Northern	9	1	11.1	0	0	0	8
Yorkshire	10	0	0.0	0	0	0	10
Trent	3	0	0.0	0	0	0	3
Eastern	26	2	7.7	0	0	0	24
London	14	0	0.0	0	0	0	14
South East (East)	5	0	0.0	0	0	0	5
South East (West)	9	0	0.0	0	0	0	9
South West	7	1	14.3	0	0	0	6
West Midlands	8	0	0.0	0	0	0	8
North West	35	0	0.0	0	0	0	35
Wales	11	0	0.0	0	0	0	11
Northern Ireland	7	0	0.0	0	0	0	7
Scotland	10	0	0.0	0	0	0	10
United Kingdom	**154**	**4**	**2.6**	**0**	**0**	**0**	**150**

Table 114 : Eligible non-invasive cancers							
Region	Total submitted	Non-Registered		Unknown diagnosis date	< 45 years	> 75 years	Eligible cases
		No.	%				
Northern	75	9	12.0	0	3	0	63
Yorkshire	61	1	1.6	0	0	1	59
Trent	124	12	9.7	0	0	0	112
Eastern	133	7	5.3	0	0	0	126
London	89	2	2.2	0	0	0	87
South East (East)	124	5	4.0	0	0	1	118
South East (West)	123	0	0.0	0	1	0	122
South West	73	3	4.1	0	1	0	69
West Midlands	100	0	0.0	0	0	0	100
North West	116	2	1.7	0	1	2	111
Wales	75	6	8.0	0	2	0	67
Northern Ireland	25	0	0.0	0	0	0	25
Scotland	103	0	0.0	0	0	0	103
United Kingdom	**1221**	**47**	**3.8**	**0**	**8**	**4**	**1162**

Table 115 : Age at diagnosis of all eligible cases											
	<50		50-54		55-59		60-64		65+		Total
Region	No.	%	No.	%	No.	%	No.	%	No.	%	
Northern	11	3	102	27	112	29	124	33	32	8	381
Yorkshire	10	3	136	35	91	24	126	33	21	5	384
Trent	19	4	175	33	130	24	150	28	62	12	536
Eastern	18	3	267	38	168	24	173	25	76	11	702
London	12	2	201	32	172	27	191	30	60	9	636
South East (East)	13	2	181	29	169	27	168	27	102	16	633
South East (West)	10	2	196	31	166	26	182	29	79	12	633
South West	18	3	169	30	137	25	161	29	74	13	559
West Midlands	12	2	205	38	149	27	146	27	34	6	546
North West	20	3	227	33	196	28	192	28	60	9	695
Wales	9	3	106	30	111	32	91	26	35	10	352
Northern Ireland	0	0	50	35	37	26	48	34	6	4	141
Scotland	3	1	168	30	139	25	193	35	56	10	559
United Kingdom	**155**	**2**	**2183**	**32**	**1777**	**26**	**1945**	**29**	**697**	**10**	**6757**

Table 116 : Age at diagnosis of eligible invasive cancers											
	<50		50-54		55-59		60-64		65+		Total
Region	No.	%	No.	%	No.	%	No.	%	No.	%	
Northern	10	3	85	27	89	29	98	32	28	9	310
Yorkshire	8	3	112	36	73	23	104	33	18	6	315
Trent	16	4	132	31	102	24	118	28	53	13	421
Eastern	14	3	211	38	128	23	136	25	63	11	552
London	10	2	163	30	147	27	166	31	49	9	535
South East (East)	9	2	136	27	143	28	142	28	80	16	510
South East (West)	6	1	149	30	125	25	151	30	71	14	502
South West	15	3	135	28	121	25	145	30	68	14	484
West Midlands	9	2	167	38	118	27	118	27	26	6	438
North West	16	3	178	32	152	28	156	28	47	9	549
Wales	8	3	72	26	89	32	75	27	30	11	274
Northern Ireland	0	0	39	36	29	27	35	32	6	6	109
Scotland	3	1	131	29	103	23	165	37	44	10	446
United Kingdom	**124**	**2**	**1710**	**31**	**1419**	**26**	**1609**	**30**	**583**	**11**	**5445**

Table 117 : Age at diagnosis of eligible micro-invasive cancers											
	<50		50-54		55-59		60-64		65+		Total
Region	No.	%	No.	%	No.	%	No.	%	No.	%	
Northern	0	0	1	13	4	50	3	38	0	0	8
Yorkshire	1	10	4	40	2	20	3	30	0	0	10
Trent	0	0	0	0	3	100	0	0	0	0	3
Eastern	0	0	10	42	7	29	5	21	2	8	24
London	0	0	3	21	2	14	7	50	2	14	14
South East (East)	0	0	2	40	1	20	1	20	1	20	5
South East (West)	2	22	1	11	2	22	3	33	1	11	9
South West	1	17	3	50	1	17	1	17	0	0	6
West Midlands	0	0	3	38	5	63	0	0	0	0	8
North West	3	9	15	43	7	20	7	20	3	9	35
Wales	0	0	2	18	8	73	0	0	1	9	11
Northern Ireland	0	0	1	14	0	0	6	86	0	0	7
Scotland	0	0	5	50	3	30	1	10	1	10	10
United Kingdom	**7**	**5**	**50**	**33**	**45**	**30**	**37**	**25**	**11**	**7**	**150**

Table 118 : Age at diagnosis of eligible non-invasive cancers											
	<50		50-54		55-59		60-64		65+		Total
Region	No.	%	No.	%	No.	%	No.	%	No.	%	
Northern	1	2	16	25	19	30	23	37	4	6	63
Yorkshire	1	2	20	34	16	27	19	32	3	5	59
Trent	3	3	43	38	25	22	32	29	9	8	112
Eastern	4	3	46	37	33	26	32	25	11	9	126
London	2	2	35	40	23	26	18	21	9	10	87
South East (East)	4	3	43	36	25	21	25	21	21	18	118
South East (West)	2	2	46	38	39	32	28	23	7	6	122
South West	2	3	31	45	15	22	15	22	6	9	69
West Midlands	3	3	35	35	26	26	28	28	8	8	100
North West	1	1	34	31	37	33	29	26	10	9	111
Wales	1	1	32	48	14	21	16	24	4	6	67
Northern Ireland	0	0	10	40	8	32	7	28	0	0	25
Scotland	0	0	32	31	33	32	27	26	11	11	103
United Kingdom	**24**	**2**	**423**	**36**	**313**	**27**	**299**	**26**	**103**	**9**	**1162**

Table 119 : Size of eligible invasive cancers											
	1 - <10mm		10 - <20mm		20 - <50 mm		50 +mm		Unknown		Total No.
Region	No.	%	No.	%	No.	%	No.	%	No.	%	
Northern	90	29	135	44	75	24	4	1	6	2	310
Yorkshire	59	19	164	52	74	23	5	2	13	4	315
Trent	90	21	202	48	116	28	6	1	7	2	421
Eastern	129	23	281	51	120	22	7	1	15	3	552
London	117	22	275	51	128	24	11	2	4	1	535
South East (East)	118	23	299	59	83	16	6	1	4	1	510
South East (West)	113	23	266	53	114	23	6	1	3	1	502
South West	120	25	252	52	91	19	8	2	13	3	484
West Midlands	104	24	228	52	99	23	7	2	0	0	438
North West	131	24	254	46	132	24	11	2	21	4	549
Wales	87	32	123	45	62	23	1	0	1	0	274
Northern Ireland	24	22	56	51	25	23	1	1	3	3	109
Scotland	113	25	226	51	97	22	9	2	1	0	446
United Kingdom	**1295**	**24**	**2761**	**51**	**1216**	**22**	**82**	**2**	**91**	**2**	**5445**

Table 120 : Grade of eligible invasive cancers											
	Grade I		Grade II		Grade III		Not assessable		Unknown		Total
Region	No.	%	No.	%	No.	%	No.		%		
Northern	114	37	128	41	53	17	5	2	10	3	310
Yorkshire	112	36	131	42	53	17	3	1	16	5	315
Trent	137	33	174	41	99	24	5	1	6	1	421
Eastern	178	32	249	45	62	11	4	1	59	11	552
London	203	38	218	41	87	16	4	1	23	4	535
South East (East)	194	38	220	43	64	13	4	1	28	5	510
South East (West)	189	38	206	41	87	17	3	1	17	3	502
South West	142	29	217	45	92	19	2	0	31	6	484
West Midlands	157	36	185	42	86	20	0	0	10	2	438
North West	148	27	251	46	75	14	8	1	67	12	549
Wales	73	27	144	53	46	17	1	0	10	4	274
Northern Ireland	37	34	47	43	17	16	3	3	5	5	109
Scotland	153	34	191	43	86	19	10	2	6	1	446
United Kingdom	**1837**	**34**	**2361**	**43**	**907**	**17**	**52**	**1**	**288**	**5**	**5445**

Table 121 : Nodal status of eligible invasive cancers							
	Positive		Negative		Unknown		Total
Region	No.	%	No.	%	No.	%	
Northern	73	24	173	56	64	21	310
Yorkshire	111	35	150	48	54	17	315
Trent	88	21	292	69	41	10	421
Eastern	119	22	331	60	102	18	552
London	115	21	341	64	79	15	535
South East (East)	190	37	234	46	86	17	510
South East (West)	100	20	311	62	91	18	502
South West	96	20	264	55	124	26	484
West Midlands	93	21	277	63	68	16	438
North West	111	20	191	35	247	45	549
Wales	69	25	202	74	3	1	274
Northern Ireland	23	21	75	69	11	10	109
Scotland	115	26	314	70	17	4	446
United Kingdom	**1303**	**24**	**3155**	**58**	**987**	**18**	**5445**

Table 122 : NPI of eligible invasive cancers													
	EPG		GPG		MPG1		MPG2		PPG		Unknown		Total
Region	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	
Northern	63	20	72	23	57	18	28	9	13	4	77	25	310
Yorkshire	50	16	71	23	61	19	35	11	26	8	72	23	315
Trent	102	24	111	26	74	18	58	14	23	5	53	13	421
Eastern	112	20	148	27	88	16	39	7	18	3	147	27	552
London	128	24	141	26	84	16	53	10	25	5	104	19	535
South East (East)	93	18	112	22	90	18	76	15	32	6	107	21	510
South East (West)	120	24	129	26	75	15	44	9	25	5	109	22	502
South West	82	17	125	26	77	16	38	8	19	4	143	30	484
West Midlands	96	22	123	28	74	17	45	10	23	5	77	18	438
North West	46	8	82	15	77	14	31	6	17	3	296	54	549
Wales	56	20	108	39	58	21	18	7	20	7	14	5	274
Northern Ireland	24	22	36	33	19	17	9	8	2	2	19	17	109
Scotland	114	26	141	32	92	21	44	10	23	5	32	7	446
United Kingdom	**1086**	**20**	**1399**	**26**	**926**	**17**	**518**	**10**	**266**	**5**	**1250**	**23**	**5445**

Table 123 : Data quality of eligible invasive cancers									
	Unknown size		Unknown grade		Unknown nodal status		Unknown NPI stage		Total
Region	No.	%	No.	%	No.	%	No.	%	
Northern	6	2	10	3	64	21	77	25	310
Yorkshire	13	4	16	5	54	17	72	23	315
Trent	7	2	6	1	41	10	53	13	421
Eastern	15	3	59	11	102	18	147	27	552
London	4	1	23	4	79	15	104	19	535
South East (East)	4	1	28	5	86	17	107	21	510
South East (West)	3	1	17	3	91	18	109	22	502
South West	13	3	31	6	124	26	143	30	484
West Midlands	0	0	10	2	68	16	77	18	438
North West	21	4	67	12	247	45	296	54	549
Wales	1	0	10	4	3	1	14	5	274
Northern Ireland	3	3	5	5	11	10	19	17	109
Scotland	1	0	6	1	17	4	32	7	446
United Kingdom	**91**	**2**	**288**	**5**	**987**	**18**	**1250**	**23**	**5445**

Table 124 : Relative survival by region - invasive cancers diagnosed 1996/97			
	1 year	3 year	5 year
Northern	99.0 (97.6-100.5)	95.6 (92.7-98.5)	94.5 (91.0-98.0)
Yorkshire	99.7 (98.6-100.8)	99.2 (97.3-101.1)	99.5 (97.2-101.9)
Trent	100.2 (99.6-100.9)	96.7 (94.5-99.0)	94.0 (91.0-97.1)
Eastern	100.0 (99.3-100.7)	98.8 (97.2-100.4)	97.5 (95.3-99.8)
London	99.4 (98.4-100.4)	97.9 (96.1-99.7)	96.1 (93.7-98.6)
South East (East)	99.8 (98.9-100.7)	96.9 (94.9-99.0)	93.0 (90.0-95.9)
South East (West)	99.4 (98.3-100.4)	97.4 (95.4-99.4)	95.5 (92.8-98.1)
South West	99.9 (99.1-100.8)	98.1 (96.2-100.0)	98.1 (95.7-100.4)
West Midlands	99.3 (98.1-100.4)	97.9 (95.9-99.8)	94.4 (91.5-97.2)
North West	99.2 (98.2-100.3)	97.8 (96.0-99.6)	96.0 (93.7-98.4)
Wales	100.0 (99.0-101.0)	97.2 (94.5-99.9)	91.3 (87.1-95.5)
Northern Ireland	100.7 (100.7-100.7)	100.3 (97.7-102.9)	100.1 (96.3-103.8)
Scotland	98.5 (97.1-99.9)	95.6 (93.2-98.0)	92.2 (88.8-95.6)
United Kingdom	**99.6 (99.3-99.8)**	**97.5 (97.0-98.1)**	**95.4 (94.6-96.2)**

Table 125 : Relative survival by age - invasive cancers diagnosed 1996/97			
	1 year	3 year	5 year
<50	98.6 (96.4-100.9)	95.9 (92.0-99.8)	95.7 (91.4-99.9)
50-54	99.5 (99.1-100.0)	97.4 (96.5-98.3)	96.0 (94.8-97.1)
55-59	99.3 (98.7-99.9)	96.7 (95.5-97.9)	93.7 (92.1-95.3)
60-64	99.6 (99.0-100.2)	97.7 (96.6-98.8)	95.5 (94.0-97.1)
65+	100.4 (99.4-101.4)	100.1 (98.0-102.1)	97.3 (94.2-100.4)
All invasive cancer	**99.6 (99.3-99.8)**	**97.5 (97.0-98.1)**	**95.4 (94.6-96.2)**

Table 126 : Relative survival by size - invasive cancers diagnosed 1996/97			
	1 year	3 year	5 year
<10mm	99.1 (98.4-99.8)	98.4 (97.3-99.5)	97.5 (96.1-98.9)
10-<20mm	100.2 (99.9-100.5)	98.9 (98.2-99.6)	97.2 (96.2-98.2)
20-<49mm	99.4 (98.7-100.1)	94.6 (93.1-96.2)	90.4 (88.3-92.5)
50+mm	93.3 (87.4-99.2)	88.5 (80.7-96.3)	82.4 (72.8-91.9)
Unknown	95.2 (90.4-100.0)	92.2 (85.8-98.6)	89.1 (81.4-96.9)
All invasive cancer	**99.6 (99.3-99.8)**	**97.5 (97.0-98.1)**	**95.4 (94.6-96.2)**

Table 127 : Relative survival by grade - invasive cancers diagnosed 1996/97			
	1 year	3 year	5 year
Grade I	100.0 (99.6-100.4)	100.7 (100.0-101.3)	99.7 (98.7-100.7)
Grade II	99.8 (99.4-100.2)	97.2 (96.3-98.2)	95.3 (94.1-96.5)
Grade III	98.1 (97.1-99.2)	91.9 (89.8-94.0)	86.5 (83.9-89.1)
Not assessable or unknown	99.0 (97.5-100.4)	97.9 (95.6-100.2)	96.5 (93.5-99.6)
All invasive cancer	**99.6 (99.3-99.8)**	**97.5 (97.0-98.1)**	**95.4 (94.6-96.2)**

Table 128 : Relative survival by nodal status - invasive cancers diagnosed 1996/97			
	1 year	3 year	5 year
Negative	100.1 (99.8-100.4)	99.1 (98.5-99.8)	98.0 (97.1-98.9)
Positive	98.4 (97.6-99.3)	93.0 (91.4-94.6)	87.7 (85.5-89.8)
Unknown	99.3 (98.6-100.1)	98.4 (97.2-99.7)	97.1 (95.4-98.8)
All invasive cancer	**99.6 (99.3-99.8)**	**97.5 (97.0-98.1)**	**95.4 (94.6-96.2)**

Table 129 : Relative survival by NPI group - invasive cancers diagnosed 1996/97			
	1 year	3 year	5 year
EPG	100.2 (99.7-100.6)	101.0 (100.3-101.7)	100.5 (99.3-101.7)
GPG	100.1 (99.7-100.6)	99.4 (98.4-100.3)	98.6 (97.3-99.9)
MPG1	99.7 (99.1-100.4)	96.7 (95.1-98.2)	94.2 (92.2-96.3)
MPG2	99.9 (99.2-100.7)	92.6 (90.0-95.3)	87.4 (84.0-90.8)
PPG	94.2 (91.2-97.3)	83.3 (78.5-88.2)	71.5 (65.5-77.5)
NPI Unknown	99.2 (98.5-99.9)	98.2 (97.0-99.4)	96.6 (95.0-98.2)
All invasive cancer	**99.6 (99.3-99.8)**	**97.5 (97.0-98.1)**	**95.4 (94.6-96.2)**

Table 130 : Relative survival by invasive status - cancers diagnosed 1996/97			
	1 year	3 year	5 year
Invasive	99.6 (99.3-99.8)	97.5 (97.0-98.1)	95.4 (94.6-96.2)
Micro-invasive	100.6 (100.6-100.6)	101.4 (100.0-102.7)	101.7 (99.3-104.0)
Non-invasive	100.5 (100.2-100.7)	100.4 (99.6-101.2)	100.5 (99.4-101.6)

Produced by the West Midlands NHS Breast and Cervical Screening Quality Assurance Reference Centre