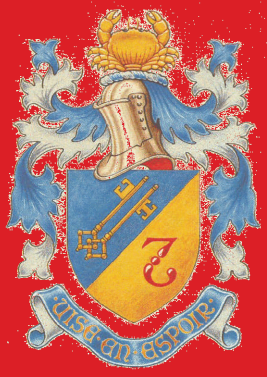


NHS

Cancer Screening Programmes

NHS BREAST SCREENING PROGRAMME

&

ASSOCIATION OF BREAST SURGERY AT BASO

AN AUDIT OF SCREEN DETECTED BREAST CANCERS FOR THE YEAR OF SCREENING APRIL 2006 TO MARCH 2007

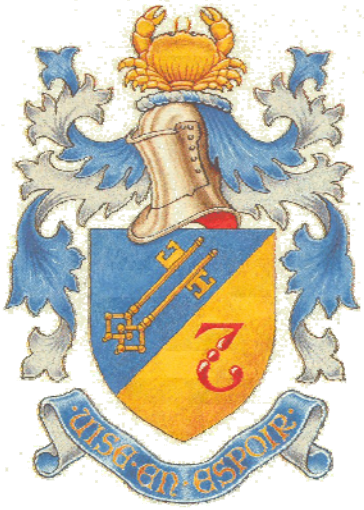
DISTRIBUTED AT THE ASSOCIATION OF BREAST SURGERY AT BASO CONFERENCE

11th JUNE 2008

NATIONAL MOTORCYCLE MUSEUM, BIRMINGHAM

West Midlands
Cancer Intelligence Unit

Cancer Screening Programmes



West Midlands
Cancer Intelligence Unit

FOREWORDS

I am delighted to write a foreword to the 11th surgical audit publication. This document, produced by the ABS at BASO, formerly the BASO Breast Speciality Group, contains a goldmine of useful information; useful for managers and commissioners since good practice and trends are identifiable, useful for surgeons who can judge their own performance against their peers, and useful for women facing the reality of breast cancer and who can access this information via the worldwide web. It is also recognised as hugely informative around the world, where the work done in this area by surgeons reflects very well on the UK.

This is the last edition which will also contain a foreword from Hugh Bishop. It was Hugh who was the original driving force behind this audit and who has nurtured it to the strong position it is in today. He is now handing over the baton. I have no doubt the audit will continue to flourish, but I should like to take this opportunity to thank Hugh, on behalf of the NHSBSP for his enormous contribution and also for the sense of fun which he brought to this highly demanding and important task.

Julietta Patnick CBE
Director for the NHS Cancer Screening Programmes

This year we are celebrating twenty years of NHS Breast Cancer Screening. In 1987, the decision by the then Prime Minister, Mrs Thatcher, to institute breast screening was a bold one, given that no structure for breast screening existed. Furthermore, other than the enthusiasts, the support by some professional groups was distinctly muted. Nevertheless, from the start the NHSBSP has been quality assured and this culture of quality has been the cornerstone of the Programme's success.

Another success has been the ABS at BASO Audit which is now in its twelfth year. The Audit has grown in power each year. Why has it been so successful? There is probably no one answer. Audit is good, but enthusiasm and commitment are needed. Your auditors have always recognised that routine NHS data may be inaccurate. We have therefore never named and shamed. The result is that gradually, miraculously even, the data quality has improved year on year as people have recognised that they are part of this honest endeavour.

And what an endeavour it is!

The ABS audit is the largest and most successful screening audit in the world. In large part this is due to Gill Lawrence and her team at the WMCIU who over the last twelve years have refined the power of the audit. We all owe a considerable debt of gratitude to them for their massive contribution. I am delighted that the WMCIU has now become the National Lead for Breast Cancer a tribute to Gill's years of hard work.

I shall step down from the Audit this year. Neil Rothnie succeeds as Chair of the ABS at BASO Audit Group and I know you will continue to give him your unstinting support. It has been a pleasure to have been part of this mighty audit and I wish it every success in the future.

Hugh Bishop
Chair of the ABS at BASO screening audit group

ACKNOWLEDGEMENTS

The 2006/07 audit of screen detected breast cancers was designed and directed by the Breast Screening Audit Steering Group of the Association of Breast Surgery at BASO.

Mr Hugh Bishop	Chair, Breast Audit Group, Association of Breast Surgery at BASO
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Dr Gill Lawrence	Regional Director of Breast and Cervical Screening Quality Assurance, West Midlands Cancer Intelligence Unit
Prof. Julietta Patnick	Director of the NHS Cancer Screening Programmes
Ms Jacquie Reed	QA Performance Manager, East Midlands Breast Screening QA Reference Centre
Dr Matthew Wallis	Consultant Radiologist, Addenbrooke's Hospital, Cambridge
Mr Roger Watkins	Consultant Breast Surgeon, Derriford Hospital, Plymouth
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 contributions to the 2006/07 audit of screen detected breast cancer.

NHSBSP Surgical QA Co-ordinators, QA Co-ordinators and Programme Directors for overseeing regional data collection and validation at the regional QA reference centres.

QA Data Managers, Screening Office Managers and staff within the NHSBSP for collecting, collating and validating the regional data.

Regional cancer registry staff who co-operated with their regional QA reference centres to collect survival audit data. Mrs Helen Bray from the Office for National Statistics and Mrs Diane Edwards from the Health GIS Service at the West Midlands Cancer Intelligence Unit for producing the map of the NHSBSP.

Ms Lucy Davies at the ABS at BASO office for valuable assistance and support, 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 2006/07 audit of screen detected breast cancers.

CONTENTS

INTRODUCTION

AIMS AND OBJECTIVES

The 2006/07 NHSBSP and Association of Breast Surgery at BASO (ABS at BASO) audit of screen detected breast cancer was undertaken to examine NHS Breast Screening Programme (NHSBSP) clinical activity in the period 1 April 2006 to 31 March 2007. The audit was designed to assess clinical performance by comparison of data with as many as possible of the clinical 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 Third Edition November 2003

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 the Management of Symptomatic Breast Disease
European Journal of Surgical Oncology, Volume 31, S1-521, May 2005

The audit covers the following main topic areas:

- the number and invasive status of screen detected breast cancers
- non-operative diagnosis and use of diagnostic open biopsy
- surgical treatment and tumour size
- waiting times
- lymph node status, invasive grade and NPI score
- surgical caseload
- repeat therapeutic operations
- adjuvant therapy
- survival analysis

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 A)
- a main ABS at BASO breast audit questionnaire with guidance notes (Appendix B)
- an adjuvant therapy data collection form with guidance notes (Appendix C)
- a survival audit data collection form with guidance notes (Appendix D)

The format of the audit was designed by the ABS at BASO Breast Screening Audit Steering Group and was subject to comment from the surgical QA co-ordinators, 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.

Main Audit Questionnaire

The ABS at BASO breast main audit questionnaire was designed to enable collection of data describing breast screening activity in the 2006/07 screening year. The cohort of women included in this period was selected to be identical to that included in the statistical KC62 reports for 2006/07, 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.

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 services.

Adjuvant Therapy Audit

Each screening surgeon was asked to collect information for women with a date of first offered appointment from 1 April 2005 to 31 March 2006 inclusive. Information was sought regarding start dates for radiotherapy where applicable and whether or not the women had started chemotherapy and/or hormone therapy. These data were linked to data collected in the main audit for 2005/06 to provide information on waiting times for adjuvant therapy and patterns of treatment.

Survival Audit

The survival audit utilised existing links between QA reference centres and regional cancer registries to obtain death data for women with screen detected cancer. Details of the women with screen detected breast cancer diagnosed between 1 January 1990 and 31 December 1991 were obtained by the breast screening services and matched with databases held at regional cancer registries to identify the date of death for any woman who died on or before 31 December 2006.

Responsibility for survival audit data collection rested with regional breast screening QA co-ordinators. Effective communication and collaboration with regional cancer registries is a vital element in the success of the survival audit.

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 eight English regions and data for Wales, Northern Ireland and Scotland are presented in this document.

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. Lead surgeons in each breast screening service were responsible for making sure that the data were available and 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.

The identification of individuals with responsibility for ensuring that data are gathered and are a true reflection of clinical work is intended to clarify ownership of the information for the audit. Ownership of the information is essential if a need for change is highlighted which must be accepted and implemented.

The ground level data collection was carried out by a range of staff, including individual surgeons, 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 clinical 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 has developed specialist spreadsheets in Microsoft Excel which are used by each regional QA reference centre to collate regional data in a standard format. Individual screening services either provide the data to their regional QA reference centre in the Excel spreadsheet or by hand on a paper copy. The spreadsheet includes 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 NHSBSP and ABS at BASO Breast Screening Audit Steering Group, acted as the central collection and collation point for national data. During the collation of national data, extensive validation checks are used to ensure that the data are an accurate reflection of clinical 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 NHSBSP and ABS at BASO Breast Screening Audit Steering Group.

Publication of Audit Data

The ABS at BASO 2006/07 audit of screen detected breast cancers is published as a booklet with financial assistance from NHSBSP National Office. The booklet will be distributed at the annual ABS at BASO annual meeting on **11 June 2008.**

Following the ABS at BASO meeting, the booklet will be available to download from the following web sites.

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

Referencing this Document

This document should be cited in the following way: *"An audit of screen detected breast cancers for the year of screening April 2006 to March 2007", NHSBSP, ABS at BASO*.

USING THE AUDIT DATA TO IMPROVE PERFORMANCE

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

At National Level

The NHSBSP and ABS at BASO breast audit data should be considered formally at a meeting of the regional breast screening 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 NHSBSP and ABS at BASO breast audit data should be considered formally at a meeting

of the regional breast screening QA team and 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 service as an 'outlier' in a particular area, regional QA reference centres and regional QA surgeons should ensure that screening services 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 services. 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 NHSBSP and 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 NHSBSP and 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 2006/07 audit, about this document or about the development of future NHSBSP and ABS at BASO breast screening audits please put them in writing to:

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PROVISION OF DATA FOR THE 2006/07 AUDIT

The map below shows the eight English NHS regions, Wales, Scotland and Northern Ireland for the boundaries revised on 1 April 2007. Data for the South East health region are subdivided into the two QA reference centre boundaries, South East Coast and South Central. These regions appeared as South East (East) and South East (West) respectively in earlier audit booklets.

KEY FINDINGS AND RECOMMENDATIONS

CANCERS DETECTED BY SCREENING

1,955,825 women were screened by the UK NHSBSP in England, Wales, Northern Ireland and Scotland between 1 April 2006 and 31 March 2007. 15,856 cancers were detected in women of all ages. This equates to a cancer detection rate of 8.1 cancers per 1,000 women screened.

93% of women with a screen-detected breast cancer were aged between 50 and 70 when they were invited for the screening appointment leading to their diagnosis. 27% of screen-detected breast cancers were diagnosed in women aged 65-70. 4% of cancers were detected in women aged 71-75.

NON-OPERATIVE DIAGNOSIS

In 2006/07 in the UK as a whole, 94% of cancers detected in the UK NHSBSP were diagnosed non-operatively. All regions and 87 screening units met or exceeded the overall non-operative diagnosis rate target of 90%. The overall non-operative diagnosis rate has been between 93% and 94% for the last 4 years and this is the third year running that all screening units have met the 80% minimum standard.

The proportion of cancers diagnosed by C5 cytology alone fell from 7% in 2004/05 to 4% in 2006/07. In Northern Ireland in 2006/07, 15% of cancers were diagnosed with C5 cytology alone compared with 45% in 2004/05. In the three English regions with the highest proportion of cancers diagnosed by C5 cytology alone, the use of the technique is mostly confined to a relatively small number of screening units. The QA reference centres in these three regions should investigate why such high proportions of cancers are still being diagnosed on the basis of C5 cytology alone in these units.

The UK non-operative diagnosis rates for invasive and non-invasive cancers were 98% and 81% respectively. The proportion of non-invasive cancers without a non-operative diagnosis varied from 25% in South Central to 10% in Wales. For non-invasive cancers, Wales was the only region to meet the 90% target for non-operative diagnosis and in 8 regions less than 80% of non-invasive cancers were diagnosed non-operatively. In 4 screening units, less than 60% of non-invasive cancers were diagnosed non-operatively.

For 22% of cancers with a B5a (Non-invasive) non-operative diagnosis, invasive disease was found at surgery. For 4 screening units the proportion of cancers with B5a (Non-invasive) diagnosis later found to have invasive component was significantly higher than the average rate of 22%. Regional QA reference centres should carry out audits with these 4 screening units to ascertain the reason for these unusual results.

67 cases with a B5b (Invasive) non-operative diagnosis were found to have non-invasive or micro-invasive cancer with no associated invasive disease following surgery. For 42 cases with a B5a (Non-invasive) non-operative diagnosis and for 15 cases with a B5b (Invasive) non-operative diagnosis, no malignant disease was identified at surgery, but subsequent audit confirmed that a correct diagnosis of invasive cancer had been reported in the pre-operative core biopsy. 96% of the 641 cancers diagnosed by C5 cytology alone were found to be invasive after surgery.

89% of women had all attempts at core biopsy and/or cytology performed at one assessment clinic visit.18 screening units failed to achieve the 80% non-operative diagnosis minimum standard at one visit and 4 units failed to achieve a non-operative diagnosis rate of 70% at the first visit. Regional QA reference centres should carry out audits with these 4 screening units.

DIAGNOSTIC OPEN BIOPSIES

In the UK as a whole, 2,699 diagnostic open biopsies were performed in 2006/07. Of these 67% were benign and 33% were malignant. The benign open biopsy rate was 0.93 per 1,000 women screened in 2006/07. This rate varied between 0.61 per 1,000 screened in West Midlands and 1.23 per 1,000 screened in East of England. The malignant open biopsy rate has fallen from 2.04 per 1,000 women screened in 1996/97 to 0.45 per 1,000 women screened in 2006/07 as the non-operative diagnosis rate has increased from 63% to 94%.

In the UK as a whole, there were 4 false positive cytology cases and 22 false positive core biopsy cases. Regional QA reference centres and their pathology QA co-ordinators should review these cases to ascertain the reasons behind these results. 21 cancers which were diagnosed by open surgical biopsy had a mastectomy as the first surgical operation. Regional QA reference centres should review these cases to ascertain the reasons behind these decisions.

13 invasive cancers and 11 non-invasive cancers diagnosed by open biopsy had no non-operative procedure recorded. Regional QA reference centres and regional QA surgeons should audit these 24 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 non-operative diagnosis should be ascertained. 39% of invasive cancers and 36% of non-invasive cancers diagnosed by malignant open biopsy following cytology or core biopsy performed during the assessment process had a C4 cytology or B4 core biopsy result indicating suspicion of malignant disease. Regional QA reference centres in East Midlands, East of England and Northern Ireland should audit these cases to ascertain why they have particularly high proportions of open biopsies with a C4 and/or B4 non-operative result.

SURGICAL TREATMENT

Overall, 70% of non-invasive and micro-invasive cancers were treated with conservation surgery, varying from 62% in East Midlands to 74% in South Central. In 2006/07 only 7% of non-invasive cancers had an unknown cytonuclear grade and/or size. The completeness of cytonuclear grade and size data has improved since 2000/01, possibly because of increased participation in the Sloane Project. Regional QA reference centres should identify which of their units are submitting cases to the Sloane Project and encourage others to do so. 109 potentially large high cytonuclear grade non-invasive cancers were treated with conservation surgery. Regional QA reference centres and regional QA surgeons should review the data recorded for these cases to ensure that they were not under-treated.

In the UK as a whole, the mastectomy rate for invasive cancers was 26%. This varied between 13% and 48% in individual screening units. 83% of 50+mm invasive cancers were treated with mastectomy compared with 18% of small (<15mm) invasive cancers. In most regions there was a clear variation in mastectomy rate with tumour size. South Central and Northern Ireland had relatively low mastectomy rates for cancers with invasive size 50mm or above, with only 67% and 25% of cancers respectively treated with mastectomy compared to 83% in the UK as a whole. Regional QA reference centres should investigate whether this reflects a data collection problem relating to second operations or whether the data do indeed represent clinical practice.

Whole tumour size was not provided for 400 (3%) invasive cancers. 100 of the cancers without a whole tumour size were in London, 49 were in East of England and 43 were in North East Yorkshire & Humber. In Northern Ireland, 10% of their invasive cancers did not have whole tumour size provided. The QA reference centres in these regions should ascertain why these important data were not available from their screening units.

Overall only 13% of cancers with a whole tumour size <15mm were treated with mastectomy compared with 18% of cancers with an invasive size <15mm. In all but 8 screening units, the mastectomy rate for cancers with a whole tumour size <15mm was higher than that for cancers with an invasive size <15mm and in 4 screening units the mastectomy rates were the same for the two groups of cancers. These data indicate that the presence of *in situ* disease accounts for a proportion

of the mastectomies performed on tumours with an invasive size <15mm. In order to ascertain the reasons for non-random variation in clinical practice, regional QA reference centres and regional QA surgeons should review the data for all screening units lying outside (above and below) the control limits in Figure 22 which shows the inter-unit variation in the proportion of small cancers with whole tumour size <15mm which had a mastectomy.

13% of cancers treated with mastectomy were recorded as having immediate reconstruction. Of these cancers, 59% were invasive, 4% were micro-invasive, and 38% were non-invasive. Only 10% of invasive cancers treated with mastectomy were recorded as having immediate reconstruction compared with 23% of micro-invasive and non-invasive cancers treated with mastectomy. There was no immediate reconstruction recorded in 18 screening units. QA Reference centres should confirm whether or not these units are able to offer immediate reconstructive surgery.

WAITING TIMES

94% and 56% of the women had their first therapeutic treatment within 2 months and 1 month, respectively, of their first assessment visit. All regions except London met the minimum standard that 90% of women should have their first therapeutic treatment within 2 months of their first assessment visit. 73% of women had their first therapeutic surgery within 2 months of their screening visit. This varied between 53% in London and 87% in West Midlands.

LYMPH NODES AND INVASIVE GRADE

In the UK as a whole, 97% of surgically treated invasive cancers had known nodal status. In 25 screening units, nodal status was ascertained for 100% of surgically treated invasive cancers. Regional QA reference centres with screening units with more than 5% of cases with unknown nodal status should audit these cases to determine the reasons for the absence of these important data.

40% of surgeons performed a full sentinel lymph node procedure using isotope and blue dye. This varied from 0% in Northern Ireland to 55% in South West. A further 40 surgeons (11%) carried out blue dye guided 4 node sampling. This was the predominant axillary technique used by surgeons in Wales (33%). For the 11,998 invasive cancers with axillary surgery, 38% had a sentinel lymph node procedure. The number of women with less than four nodes taken without a sentinel lymph node procedure has dropped from 4.6% in 2005/06 to 3.1% in 2006/07.

In the UK as a whole, the proportion of cases with positive nodal status (24%) was similar to that in previous years. A wide variation in nodal status was apparent in individual screening units with the proportion of positive nodes ranging from 10% to 38%. 10% of the 887 cancers which had their positive nodal status determined from a sentinel lymph node procedure where less than 4 nodes were taken, appeared to have had no subsequent axillary procedure. A further 30 invasive cancers had their positive nodal status determined on the basis of fewer than 4 nodes without a sentinel node procedure. Regional QA reference centres and regional QA surgeons should follow up all of these cases to ensure that the appropriate nodal procedures have been undertaken and that the axilla has not been under-treated.

Although nodal assessment is not usually indicated for non-invasive cancers, 28% of non-invasive cancers had known nodal status. For non-invasive cancers with known nodal status, 83% of those undergoing conservation surgery and 90% of those undergoing mastectomy had non-invasive disease predicted by a B5a (Non-invasive) core biopsy result. Radiological or clinical factors may thus have influenced the decision to take nodes for these cases.

81% of the non-invasive cases with known nodal status were treated by mastectomy. This varied from 46% in Northern Ireland to 94% in East Midlands and 96% in Scotland. The median number of nodes taken for non-invasive cancers undergoing conservative surgery and mastectomy were 3.5 and 4 respectively. The maximum numbers of nodes taken for cases treated with conservative surgery and mastectomy were 15 and 33 respectively. The maximum number of nodes taken for mastectomy cases varied from 10 in Northern Ireland to 29 in North West and 33 in London.

Overall, 27% of invasive cancers were Grade I, 51% were Grade II and 21% were Grade III. Grade was not assessable for 83 cases (1%) and unknown for 117 cases (1%). Control charts suggest that there are local variations in the interpretation of invasive grade definitions which should be investigated by regional QA reference centres and regional QA pathologists. Data were available to calculate a Nottingham Prognostic Index (NPI) score for 96% of surgically treated invasive cancers. Regional QA reference centres and their regional QA pathologists and regional QA surgeons should investigate the reasons for the significant variations in the proportion of EPG, GPG and PGP cancers apparent for some screening units in the NPI control charts.

SURGICAL CASELOAD

There were 559 consultant breast surgeons working in the UK NHSBSP in 2006/07. 91% of women were treated by a surgeon with a screening caseload of at least 20 cases. Of the 186 surgeons with screening caseload of less than 10 cases, 46% treated more than 30 symptomatic breast cancers during 2006/07. Information was unavailable to explain the low caseload of 16 surgeons treating a total of 25 women. 8 of these surgeons were in London. Regional QA reference centres and QA surgeons should investigate why screening cases were treated by these low caseload surgeons.

NUMBER AND SEQUENCE OF OPERATIONS

In the UK as a whole, 17% of cancers with a proven non-operative diagnosis by C5 cytology and/or B5 core biopsy underwent more than one therapeutic operation. This varied from 13% in Northern Ireland to 21% in South East Coast. 16% of invasive cancers and 17% of non-invasive cancers had more than one therapeutic operation. The proportion of invasive cancers having a repeat therapeutic operation varied from 12% in Northern Ireland to 19% in North East, Yorkshire & Humber, South East Coast and South West. The proportion of non-invasive cancers having a repeat therapeutic operation varied from 12% in Scotland to 21% in West Midlands.

Invasive cancers with B5b (Invasive) core biopsy had an initial mastectomy rate of 21% and non-invasive or micro-invasive cancers with a B5a (Non-invasive) core biopsy had an initial mastectomy rate of 26%. Invasive cancers with a B5a (Non-invasive) core biopsy had the highest initial mastectomy rate (33%). 12% of the 539 surgically treated invasive cancers diagnosed by C5 Cytology only had a mastectomy as their first therapeutic operation. 18 of these cancers were in North East, Yorkshire & Humber and 16 in North West. QA reference centres and QA surgeons should audit these cases to determine why cancers with unconfirmed invasive status had a mastectomy as an initial operation.

Invasive cancers with B5b (Invasive) core biopsy and those diagnosed on the basis of C5 cytology alone had fewest repeat operations (14% and 18% respectively). Invasive cancers with a B5a (Non-invasive) core biopsy had a repeat operation rate of 51% and non-invasive or micro-invasive cancers with a B5a (Non-invasive) core biopsy had a repeat operation rate of 20%. In the UK as a whole, 12% of cancers underwent repeat conservation operations to clear involved margins and 7% of cancers had repeat operations which converted initial conservative operations to a mastectomy.

In the UK as a whole, axillary surgery was performed for 99% of invasive cancers with a B5b (Invasive) core biopsy. For 98% of these cancers, the nodal status was determined at the first operation. For 96% of invasive cancers diagnosed by C5 cytology only, axillary surgery was performed at the first therapeutic operation, with 2% having their axillary surgery at a repeat operation. 89% of invasive cancers with a B5a (Non-invasive) diagnosis had axillary surgery. 48% of these cancers had their axillary surgery at the first operation, with repeat operations providing nodal data for the additional 41%. 148 invasive cancers with a B5b (Invasive) core biopsy, 13 invasive cancers with C5 cytology and 77 invasive cancers with a B5a (Non-invasive) core biopsy had no axillary procedure recorded. The results of the regional nodal audit of 2004/05 cases suggest that this could be a data collection problem. However, if the data do correctly reflect clinical practice, these cases should be audited by regional QA reference centres and regional QA surgeons to ensure that the axilla has not been under-treated.

ADJUVANT THERAPY

ER status was unknown for 2% of invasive cancers and for 48% of non-invasive cancers. 87% of invasive cancers were ER positive. PgR status data were available for 85% of ER negative invasive cancers. HER-2 status data were available for 53% of the invasive cancers. Of the 5,763 invasive cancers with known HER-2 status, 17% were positive. Regional QA reference centres and regional QA surgeons should ascertain the reasons why HER-2 status was not available for all the invasive cancers diagnosed in their regions.

Hormone therapy and radiotherapy were the main adjuvant treatments used for women in all age groups. Chemotherapy was the least used adjuvant therapy. The proportion of women receiving chemotherapy decreased with age from 26% in women aged less than 50 to 5% in women aged over 70. 44% of women received the most common treatment for screen detected breast cancer in the UK which was surgery, radiotherapy, and hormone therapy.

It took longer for women without a non-operative diagnosis to undergo an open biopsy than women with non-operative diagnosis of breast cancer to have their first surgery. This is probably because cases without a non-operative diagnosis are often more complex and therefore will usually have a longer period during which attempts to obtain a non-operative diagnosis are made. Only 40% of cases received radiotherapy within 60 days of their final surgery. Women in North East, Yorkshire & Humber experienced the longest waits for radiotherapy. If the new radiotherapy waiting times standard introduced in the Cancer Reform Strategy is to be achieved, considerable reductions in the time between final surgery and radiotherapy will be required in most regions

92% of women with invasive cancer treated with conservation surgery received adjuvant radiotherapy, compared to only 53% of women with conservatively treated non-invasive cancers. 19% of conservatively treated invasive cancers not given adjuvant radiotherapy were larger than 20mm in diameter, 13% were Grade III and 13% were node positive. Regional QA reference centres and regional QA surgeons should determine the reasons why these larger, high grade and/or node positive conservatively treated invasive cancers do not appear to have received adjuvant radiotherapy. 28% of non-invasive cancers not given adjuvant radiotherapy were high cytonuclear grade and 23% were at least 15mm in diameter. Provided that the tumour margins were adequate, it may be acceptable for conservatively treated non-invasive cancers to not receive adjuvant radiotherapy. However, regional QA reference centres and regional QA surgeons should audit the treatment provided to larger, high cytonuclear grade non-invasive cancers to ensure that these cancers did not receive less than optimal therapy.

15% of women with ER negative, node positive invasive cancers did not have chemotherapy recorded compared to 55% of ER negative, node negative invasive cancers. This suggests that nodal status was taken into account when deciding whether women would benefit from chemotherapy. 86% of the 331 ER negative, node negative invasive cancers given chemotherapy were Grade III and 26% were HER-2 positive. Older women with ER negative, node positive invasive cancers were much less likely to receive chemotherapy than younger women. QA reference centres and QA surgeons in regions where the proportion of cancers not receiving chemotherapy is 5% or more in excess of the UK average should audit their cases to determine whether the absence of chemotherapy treatment data is a true reflection of clinical practice or a data recording issue.

The decision to give hormone therapy did appear to depend to a large extent on ER and PgR status. However, 5% of ER positive, invasive cancers and 45% of ER negative, PgR positive invasive cancers did not have hormone therapy recorded. 85% of the ER positive invasive cancers not treated with hormone therapy were Grade I or II, 84% were node negative and 72% were <15mm in diameter. Nevertheless, regional QA reference centres and regional QA surgeons should audit ER and PGR positive cases to determine whether the absence of hormone therapy data is a true reflection of clinical practice or a data recording issue. 7% of ER negative cancers did have hormone therapy recorded. Given the potential side effects of hormone treatment, regional QA reference centres and regional QA surgeons should determine the reasons why hormone therapy appears to have been given to invasive and non-invasive cancers with unknown or negative ER and PgR status.

43% of ER and PgR negative invasive cancers did not have chemotherapy recorded. 45% of the these cancers were Grade III, 9% were node positive and 19% were HER-2 positive. Regional QA reference centres and regional QA surgeons should determine the reasons why chemotherapy therapy does not appear to have been given to ER and PgR negative invasive cancers in poor prognostic groups.

468 (51%) HER-2 positive cases did not have chemotherapy recorded. In the UK as a whole, 70% of these cases were greater than 20mm in diameter, 31% were Grade III, 14% were node positive and 44% were in the MPG1, MPG2 or PPG groups. Regional QA reference centres and regional QA surgeons should audit these cases to determine whether the absence of chemotherapy treatment data is a true reflection of clinical practice or a data recording issue.

SURVIVAL ANALYSIS

Of the 9,064 cancers submitted to the survival analysis for the period 1 January 1990 to 31 December 1991, 4% were excluded because they were not registered at the cancer registries. A further 73 cancers were excluded because they were not confirmed to be primary tumours and 59 more because their invasive status was not known.

The 5 year relative survival has improved significantly from 93.6% in 1990 and 1991 to 96.4% in 2000/01. The 15 year relative survival for invasive cancers diagnosed in 1990 and 1991 was 86.3% (95% CI 84.9%-87.8%). The 15 year relative survival of women with less than 10mm diameter invasive cancers was 94.6%. The 15 year relative survival of women with invasive cancers with diameter greater than 20mm was significantly lower. 15 year relative survival rates were also significantly lower for Grade III cancers at 68.9% and for node positive cancers at 64.2%. The 15 year relative survival rate for node negative cancers was 93.2% and for Grade I cancers was 98.0% (95% CI 95.3%-100.6%).

The 5 year survival rates in women in 1990 and 1991 who had invasive cancers detected in the excellent prognostic group (EPG) and the good prognostic group (GPG) are no worse than the survival rate of the general public. For these groups there has been no significant improvement between 1990 and 1991 and 2000/01. For moderate prognostic groups (MPG1 and MPG2) and the poor prognostic group (PPG), 5 year relative survival rates have improved significantly between 1990 and 1991 and 2000/01.

TOPICS TO BE AUDITED BY REGIONAL QA REFERENCE CENTRES

Topic	Region/unit (Number of cases affected)	Reference
High proportion of cases diagnosed with cytology alone	NEYH, SEC, NW	Table 4
High proportion of B5c (Not assessable/unknown) cases	NEYH (76 cases)	Table 7
B5a cancers which become invasive after surgery	4 screening units	Ch2, Fig9
Low proportion of cases diagnosed in 1 visit	4 screening units	Ch2, Fig11
False positive cytology and core biopsy cases	All (26 cases)	Table 14
Mastectomy as diagnostic open biopsy	All (21 cases)	Ch2, p.25
No non-operative diagnosis attempted	All (24 cases)	Table 16 & 17
High proportion of C4 and/or B4 cytology/core biopsy diagnosis prior to open biopsy	EoE, EM, NI	Table 18 & 19
No surgery cases	All (209 cases)	Table 20 & 27
Unknown size/grade for non-invasive cancers	All (208 cases)	Table 23
High grade and large non-invasive cancers treated with conservation surgery	All (109 cases)	Ch3, p.31
Unknown treatment type	NEYH, London, Scotland	Table 20 & 27
Low mastectomy rate for large invasive cancers	SC, NI	Table 29
Unknown invasive whole size information	London, EE, NEYH	Table 30
High mastectomy rate for small invasive cancers	8 screening units	Ch3,Fig22
Nodal status data completeness	12 screening units	Ch5,Fig27
High proportion of cases with unknown whether or not SLNB was performed	NEYH, Scotland	Table 39
Unknown predominant nodal assessment technique	EoE, NW, Scotland, NI	Ch5,p.43
Positive nodal status determined by less than 4 node obtained	All (123 cases)	Table 42
Insufficient nodal information (includes invasive cancers with no lymph nodes taken in surgery)	All (663 cases)	Ch5,p.45 & Ch7,p.66
Interpretation of invasive grade definition	All	Ch5,Fig33
Significant variance in proportion of cancers in NPI groups	All	Ch5,Fig35
Mastectomy carried out on C5 invasive cancers	All	Ch7,p.60
Availability of HER-2 data	EM, Wales, EoE	Table 75
Radiotherapy waiting time (over 200 days after final surgery)	All (82 cases)	Table 87
No radiotherapy for large, high grade and/or node positive invasive cancers treated with conservation surgery	All (187 cases)	Ch8,p.75
No radiotherapy for large & high grade non-invasive cancers treated with conservation surgery	All (28 cases)	Ch8,p.75
No chemotherapy for ER negative node positive invasive cancers	NEYH, SEC	Table 98
No hormone therapy for ER positive or ER negative PgR positive invasive cancers	Wales, EM	Table 103
Hormone therapy given to cancers with ER and PgR negative or unknown	All (178 cases)	Ch8,p.78
ER and PgR negative PPG invasive cancers without chemotherapy	All (10 cases)	Ch8,p.80
HER-2 positive PPG invasive cases without chemotherapy	All (22 cases)	Ch8.p.81

CHAPTER 1
BREAST CANCERS DETECTED BY THE UK NHSBSP

Over the past 10 years, the invasive status of cancers has been recorded as the invasive status of the surgical specimen in cases having surgery; and as the invasive status of the core biopsy in those not having surgery. With increasing use of vacuum-assisted biopsy, a number of cancers have had either the whole cancer or the invasive component removed at initial diagnostic biopsy. In this year's audit, in order to monitor these cases more accurately, the invasive status has been split into two parts: the invasive status at surgery and the final invasive status. Invasive status at surgery records the histology reported in the surgical specimen. The final invasive status takes account of the core biopsy result, the surgical histology and the MDM decision on the invasive status of the cancer. In this booklet, the final invasive status is used as the true invasive status of the cancer. Although only 64 cases are affected by this change, caution should be taken when comparing tables with previous years' data.

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

The 2006/07 NHSBSP and ABS at BASO audit examined surgical screening activity undertaken for the 1,955,825 women screened in England, Wales, Northern Ireland and Scotland between 1 April 2006 and 31 March 2007. 15,856 cancers were detected in women of all ages. This equates to a cancer detection rate of 8.1 cancers per 1,000 women screened. This varies from 7.3 per 1,000 screened in London and Northern Ireland, to 8.7 per 1,000 screened in East of England. Figure 1 shows the invasive status of these 15,856 cancers. Overall, 12,491 (79%) were invasive, 3,185 (20%) non-invasive and 152 (1%) micro-invasive. The invasive status of 28 cancers was unknown.

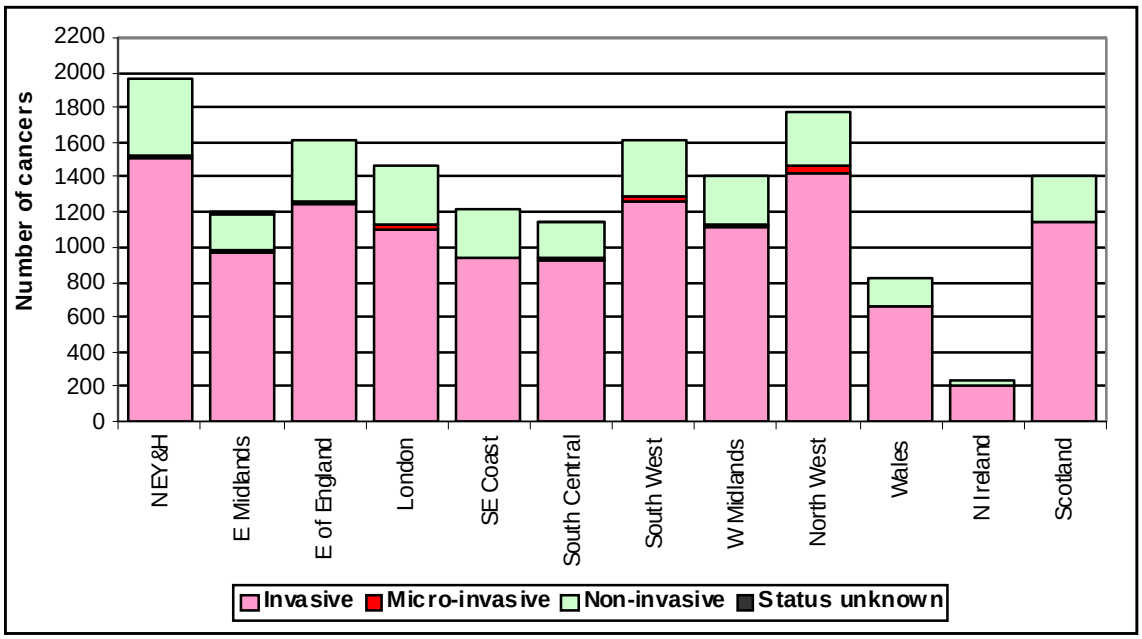

Figure 1 (Table 1): Variation in the number and invasive status of screen detected breast cancers in each region and country contributing to the 2006/07 NHSBSP and ABS at BASO breast audit

The UK invasive cancer detection rate was 6.4 per 1,000 women screened, varying between 5.5 per 1,000 screened in London and 6.9 per 1,000 screened in Wales and Scotland. The UK cancer detection rate for non-invasive and micro-invasive cancers is 1.7 per 1,000 screened. This rate varied from 1.2 per 1,000 screened in Northern Ireland to 2.0 per 1,000 screened in East of England. For small invasive cancers <15mm, the national detection rate was 3.4 and varies between 2.7 per 1,000 screened in London and 2.8 per 1,000 screened in Northern Ireland, to 3.8 per 1,000 screened in East Midlands and Wales.

The following summary table shows that the number of women screened each year has risen by more

than 370,000 since 2002/03 when the NHSBSP started to expand the screening programme to invite women up to 70 years of age. The expansion has had a marked effect on the number of cancers detected, with 4,263 more cancers diagnosed in 2006/07 compared with 2002/03. From 1996/97 to 2005/06, invasive and non-invasive cancer detection rates rose steadily. The slight fall in 2006/07 reflects the completion of the first full three years of the age expansion by the breast screening services which expanded in 2002/03 and 2003/04. In 2006/07 these services were re-screening older women who had been screened within the normal three year screening round and were no longer detecting a disproportionate number of cancers in women aged 58 to 70 who had not been screened for 6 years.

11 YEAR COMPARISON: NUMBER OF CANCERS DETECTED

Year of data collection	Number of invasive cancers	Number of non-invasive and micro-invasive cancers	Total cancers	Number of women screened	Cancer detection rates per 1000 women screened		
					Invasive	Non-invasive	Total
1996/97	5,860	1,468	7,410	1,340,175	4.4	1.1	5.5
1997/98	6,427	1,726	8,215	1,419,287	4.5	1.2	5.8
1998/99*	6,337	1,634	8,028	1,308,751	4.7	1.2	6.1
1999/00	7,675	2,076	9,797	1,550,285	5.0	1.3	6.3
2000/01	7,945	2,080	10,079	1,535,019	5.2	1.4	6.6
2001/02	7,911	2,218	10,191	1,507,987	5.2	1.5	6.8
2002/03	8,931	2,416	11,593	1,579,165	5.7	1.6	7.3
2003/04	10,400	2,868	13,290	1,685,661	6.2	1.7	7.9
2004/05	11,063	2,953	14,040	1,748,997	6.3	1.7	8.0
2005/06	12,600	3,317	15,944	1,942,449	6.5	1.7	8.2
2006/07	12,491	3,337	15,856	1,955,825	6.4	1.7	8.1

* Data from Scotland are absent in 1998/99

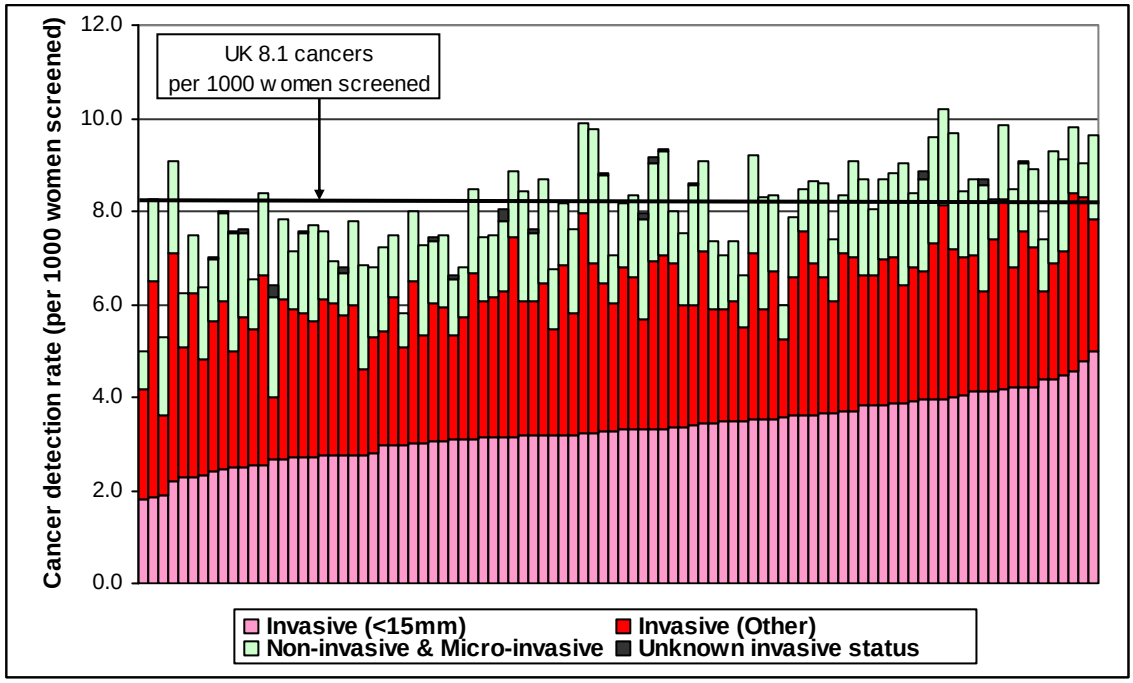

Figure 2: Variation with screening unit in the overall cancer detection rate expressed as the number of cancers detected per 1,000 women screened

Figure 2 shows the cancer detection rates in each screening unit according to invasive status. The overall cancer detection rate varied from 5.0 per 1,000 women screened in a unit screening 8,838 women to 10.2 per 1,000 women screened in a unit screening 14,640 women annually.

96 screening units in the UK are included in the 2006/07 audit. Two units merged in London and one screening unit split into three in South East Coast in the audit period. The number of women screened varies from 4,798 women in a screening unit in Northern Ireland (where 36 cancers were detected) to 59,955 women in a screening unit in Scotland (where 500 cancers were detected).

1.2 Age Profile of Women with Screen Detected Breast Cancers

The following summary table shows the effect of age expansion in the past 5 years. In 2002/03, prior to the roll out of the age expansion, only 13% of cancers were diagnosed in women aged 65-70, compared to 27% in 2005/06 and 2006/07. There is also a slight increase in the proportion of cancers were detected in women aged over 70. In 2006/07, 4% of the cancers were detected in women aged 71-75 (Table 2).

AGE DISTRIBUTION OF SCREEN-DETECTED BREAST CANCERS (%)					
Age	***2002/03***	***2003/04***	***2004/05***	***2005/06***	***2006/07***
<50	*2*	*2*	*2*	*1*	*1*
50-52	*17*	*15*	*14*	*13*	*13*
53-55	*16*	*13*	*12*	*11*	*10*
56-58	*16*	*17*	*16*	*14*	*13*
59-61	*16*	*16*	*16*	*15*	*15*
62-64	*16*	*14*	*14*	*14*	*14*
65-67	*7*	*10*	*11*	*14*	*13*
68-70	*6*	*8*	*10*	*13*	*14*
70+	*4*	*5*	*5*	*6*	*6*
Total	***100***	***100***	***100***	***100***	***100***
65+	*17*	*23*	*26*	*33*	*33*

At the start of the current audit period, the expansion of the NHSBSP to include women aged 50-70 had been rolled out in England, Wales and Scotland but not in Northern Ireland. These changes are reflected in Figure 3 in the proportion of breast cancers detected in women aged 65-70, which ranged from 3% in Northern Ireland where the expansion was not implemented during the audit period, to 30% in South East Coast and Wales.

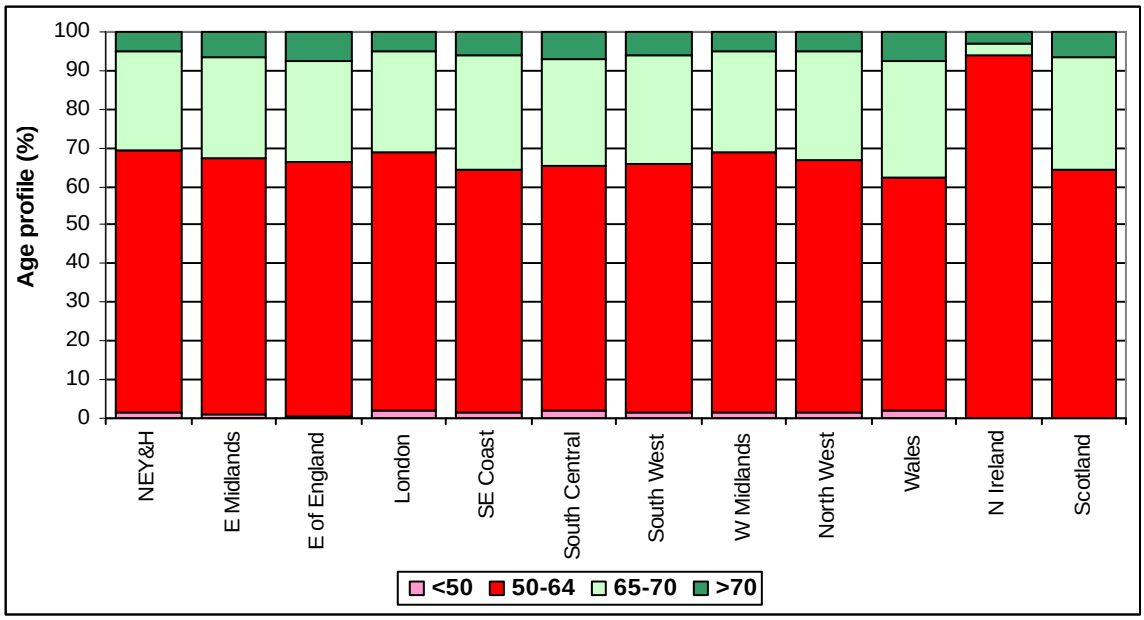

Figure 3 (Table 2): Age at screening appointment

COMMENTS:

- 1,955,825 women were screened by the UK NHSBSP in England, Wales, Northern Ireland and Scotland between 1 April 2006 and 31 March 2007.
- 15,856 cancers were detected in women of all ages. This equates to a cancer detection rate of 8.1 cancers per 1,000 women screened.
- 93% of women with a screen-detected breast cancer were aged between 50 and 70 when they were invited for the screening appointment leading to their diagnosis.
- 27% of screen-detected breast cancers were diagnosed in women aged 65-70. 4% of cancers were detected in women aged 71-75.

CHAPTER 2
DIAGNOSIS OF CANCERS

2.1 Non-operative Diagnosis

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

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

The UK NHSBSP definition of a non-operative diagnosis is a diagnosis by C5 cytology or B5 core biopsy. 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 3 of this audit, which shows there were 8 such cancers in 2006/07.

2.1.1 Non-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	**80% of women should have a non-operative diagnosis by cytology or needle histology after a maximum of two attempts**
Target Standard	**90% of women should have a non-operative diagnosis by cytology or needle histology after a maximum of two attempts**

(Quality Assurance Guidelines for Breast Cancer Screening Radiology, NHSBSP Publication No 59, January 2005)

Quality Objective	**To minimise unnecessary surgery (ie open surgical biopsies that prove to be benign)**
Outcome Measure	**More than 80% of breast cancers should have non-operative pathological diagnosis**

(Quality Assurance Guidelines for Surgeons in Breast Cancer Screening, NHSBSP Publication No 20, November 2003)

In 2006/07, 94% of cancers detected in the UK NHSBSP were diagnosed non-operatively. All regions met the 90% non-operative diagnosis rate target, with only 4% variation between regions. Figure 4 shows the non-operative diagnosis rate by C5 cytology, by both C5 cytology and B5 core biopsy and by B5 core biopsy alone. Northern Ireland had the highest proportion (15%) of cancers diagnosed by C5 cytology only. In Northern Ireland and Scotland, relatively high proportions of cancers were diagnosed by C5 cytology and B5 core biopsy (40% and 20% respectively). In Scotland, final needle aspiration (FNA) biopsies were carried out on suspicious lymph nodes. In one Scottish unit, the protocol indicates that cases might receive both cytology and core biopsy and the results of the FNA are given immediately to women before they leave the assessment clinic.

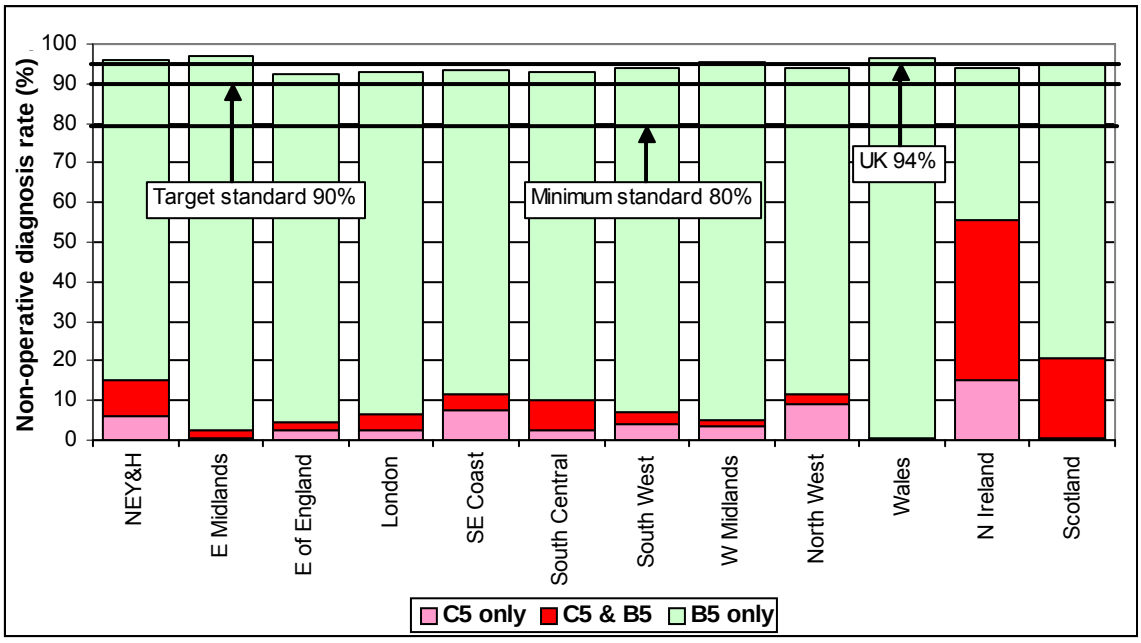

Figure 4 (Table 4): Variation in non-operative diagnosis rate and the proportion of cancers detected by cytology alone, core biopsy alone or cytology and core biopsy as a percentage of cancers detected

As demonstrated in the following summary table, over the last 11 years the non-operative diagnosis rate for the UK as a whole has risen from 63% to 94%. This rise has been accompanied by an increase from 17% to 84% in the proportion of cancers diagnosed by B5 core biopsy alone.

11 YEAR COMPARISON: NON-OPERATIVE DIAGNOSIS RATES

Year of data collection	*Total cancers*	*Number of cancers with C5 and/or B5*	*% with non-operative diagnosis by*				*Non-operative diagnosis rate (%)*
			C5 only	*C5 and B5*	*C5 (+/- B5)*	*B5 only (no C5)*	
1996/97	*7,310*	*4,576*	*-*	*-*	*45*	*17*	*63*
1997/98	*8,215*	*5,866*	*-*	*-*	*42*	*29*	*71*
*1998/99**	*8,002*	*6,449*	*-*	*-*	*36*	*44*	*81*
*1999/00**	*8,906*	*7,590*	*-*	*-*	*31*	*54*	*85*
2000/01	*10,079*	*8,775*	*19*	*8*	*-*	*60*	*87*
2001/02	*10,191*	*9,043*	*13*	*9*	*-*	*66*	*89*
2002/03	*11,593*	*10,575*	*10*	*8*	*-*	*73*	*91*
2003/04	*13,290*	*12,338*	*8*	*7*	*-*	*77*	*93*
*2004/05**	*13,783*	*12,856*	*7*	*6*	*-*	*80*	*93*
2005/06	*15,944*	*15,000*	*5*	*6*	*-*	*83*	*94*
2006/07	*15,856*	*14,968*	*4*	*6*	*-*	*84*	*94*

*Data from Scotland are absent in 1998/99 and 1999/00. 275 cancers from East of England are absent in 2004/05

The following summary table shows how the non-operative diagnosis rates in each region have changed over the last three audit periods. The non-operative diagnosis rate has increased slightly in most regions. This table also demonstrates how the overall proportion of cancers diagnosed by C5 cytology alone has decreased from 7% in 2004/05 to only 4% in 2006/07. This change has been greatest in Northern Ireland where the proportion of cancers diagnosed on the basis of C5 cytology alone has fallen from 45% in 2004/05 to 15% in 2006/07. Interestingly, this major change in practice appears to have had little impact on the overall non-operative diagnosis rate which has remained static at 94% to 95% throughout the three year period. In the three English regions with the highest proportion of cancers diagnosed by C5 cytology alone, the use of the technique is mostly confined to a relatively small number of screening units. In one unit in North East Yorkshire and Humber and in one unit in South East Coast, 30% and 25% of cancers respectively were diagnosed on the basis of C5 cytology alone. In three units in North West 28%, 42% and 56% of cancers were diagnosed by

C5 cytology alone. The QA reference centres in these three regions should investigate why such high proportions of cancers are still being diagnosed on the basis of C5 cytology alone in these units.

3 YEAR SUMMARY: NON-OPERATIVE DIAGNOSIS RATES								
	Non-operative diagnosis rate (%)				Cancer diagnosed by C5 only (%)			
Region	2004/05	2005/06	2006/07	3 Year 2004-07	2004/05	2005/06	2006/07	3 Year 2004-07
N East, Yorks & Humber	94	94	96	95	11	9	6	9
East Midlands	95	95	97	96	1	0	1	1
East of England	93	93	93	93	1	2	2	2
London	93	93	93	93	4	4	2	3
South East Coast	93	95	93	94	8	11	7	9
South Central	93	92	93	92	6	4	3	4
South West	91	94	94	93	5	3	4	4
West Midlands	95	95	96	95	6	5	4	5
North West	93	93	94	93	12	12	9	11
Wales	94	95	97	96	0	0	0	0
Northern Ireland	95	95	94	95	45	34	15	31
Scotland	92	95	95	94	3	1	0	1
United Kingdom	**93**	**94**	**94**	**94**	**7**	**5**	**4**	**5**

Figure 5 shows the non-operative diagnosis rates achieved by individual screening units. All screening units met the 80% minimum standard for overall non-operative diagnosis. 87 of the units also met or exceeded the overall non-operative diagnosis target of 90%. Non-operative diagnosis rates varied from 86% in a screening unit with a total of 81 cancers to 100% in four screening units with 184, 92, 114 and 63 cancers.

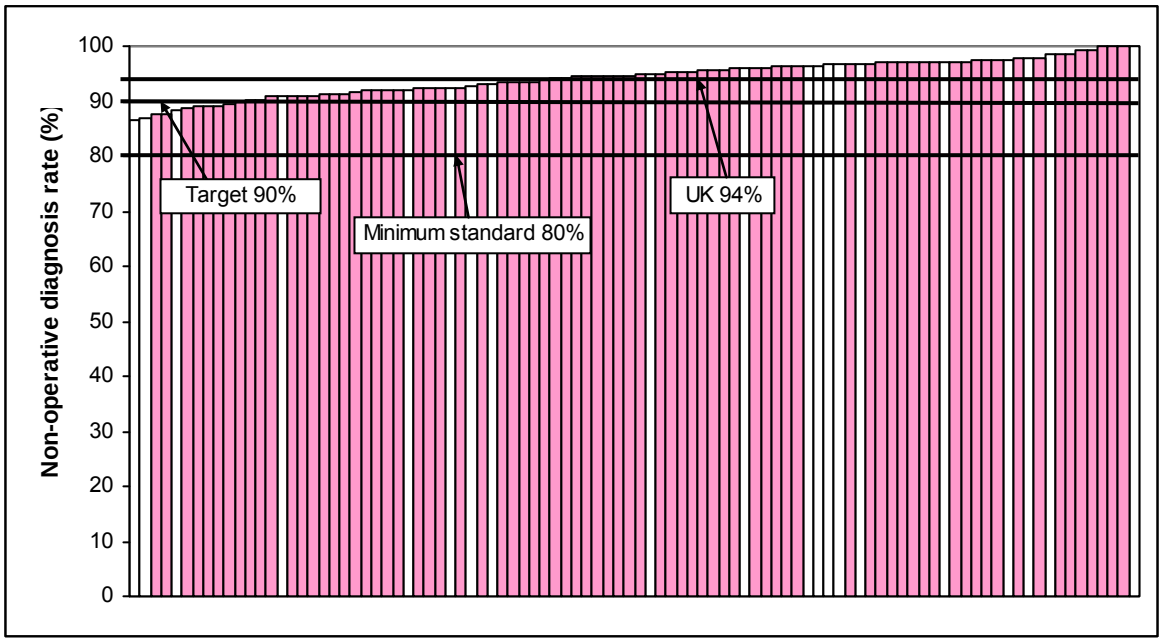

Figure 5: Variation in non-operative diagnosis rate with screening unit, expressed as a proportion of cancers detected in each screening unit

2.1.2 Non-operative Diagnosis Rates for Invasive and Non-invasive Cancers

In the UK as a whole in 2006/07, the non-operative diagnosis rates for invasive and non-invasive cancers were 98% and 81% respectively. Figure 6 shows the variation between screening units in the proportion of invasive and non-invasive cancers with a non-operative diagnosis. The 90% non-operative diagnosis target which applies to all cancers was achieved by all regions for invasive cancers, with only 2% (287 cancers) not having a non-operative diagnosis. The lowest proportions of invasive cancers with a non-operative diagnosis (93%) were recorded in two screening units in East of England and South West. The lowest proportion of non-invasive cancers with a non-operative

diagnosis (50%) was recorded in a screening unit in South Central. Interestingly, the six units with a non-operative diagnosis rate for non-invasive cancers below 60% all achieved non-operative diagnosis rates of 95% or above for invasive cancers. 2 of the 7 units with 100% non-operative diagnosis rate for non-invasive cancer achieved 99% and 98% for invasive cancers.

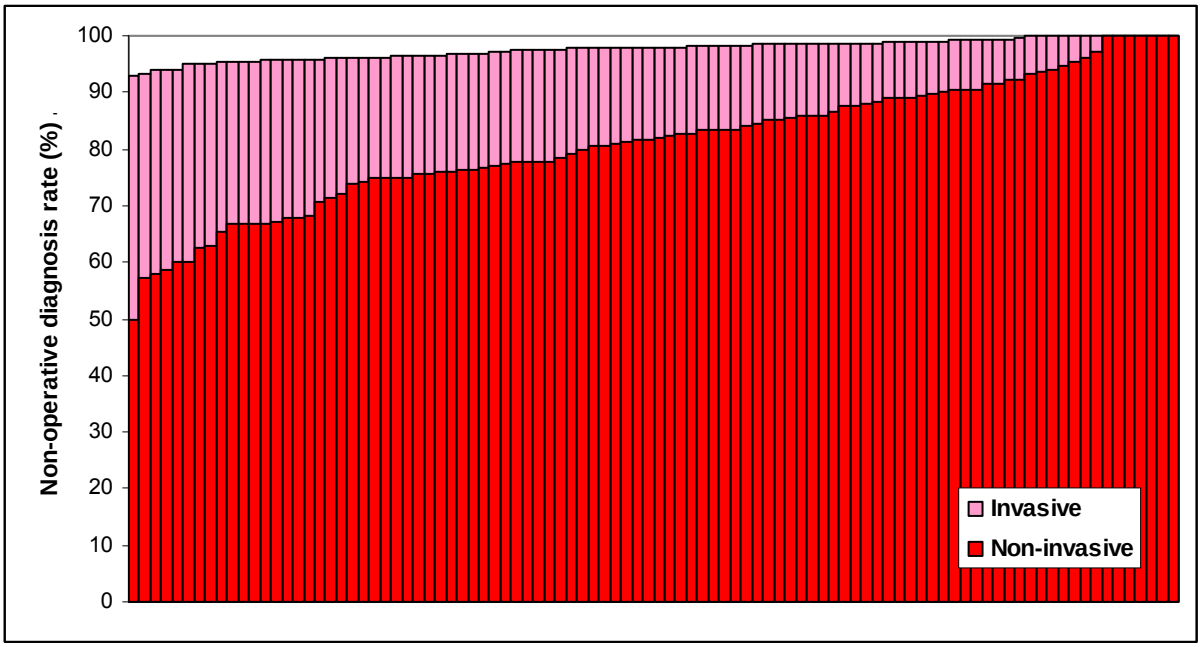

Figure 6 (Tables 5, 6): Variation in the proportion of invasive cancers and non-invasive cancers with a non-operative diagnosis

COMMENTS:

- In 2006/07 in the UK as a whole, 94% of cancers detected in the UK NHSBSP were diagnosed non-operatively. All regions and 87 screening units met or exceeded the overall non-operative diagnosis rate target of 90%.
- The overall non-operative diagnosis rate has been between 93% and 94% for the last 4 years and this is the third year running that all screening units have met the 80% minimum standard.
- The proportion of cancers diagnosed by C5 cytology alone fell from 7% in 2004/05 to 4% in 2006/07. In Northern Ireland in 2006/07, 15% of cancers were diagnosed with C5 cytology alone compared with 45% in 2004/05.
- In the three English regions with the highest proportion of cancers diagnosed by C5 cytology alone, the use of the technique is mostly confined to a relatively small number of screening units. The QA reference centres in these three regions should investigate why such high proportions of cancers are still being diagnosed on the basis of C5 cytology alone in these units.
- The UK non-operative diagnosis rates for invasive and non-invasive cancers were 98% and 81% respectively. The proportion of non-invasive cancers without a non-operative diagnosis varied from 25% in South Central to 10% in Wales.
- For non-invasive cancers, Wales was the only region to meet the 90% target for non-operative diagnosis and in 8 regions less than 80% of non-invasive cancers were diagnosed non-operatively. In 4 screening units, less than 60% of non-invasive cancers were diagnosed non-operatively.

2.1.3 Invasive Status at Core Biopsy

Screening units were asked to supply the invasive status predicted at core biopsy for those cancers with a B5 diagnosis. Of the 14,320 cancers with a B5 diagnosis, 3,383 (24%) were B5a (Non-invasive), 10,769 (75%) were B5b (Invasive) and 168 cancers (1%) had invasive status B5c (Not Assessable or Unknown) at core biopsy. Of the latter cancers, 76 were in North East, Yorkshire & Humber. The regional QA reference centre should review these cases and ascertain the reason for the relatively high numbers of B5c cases.

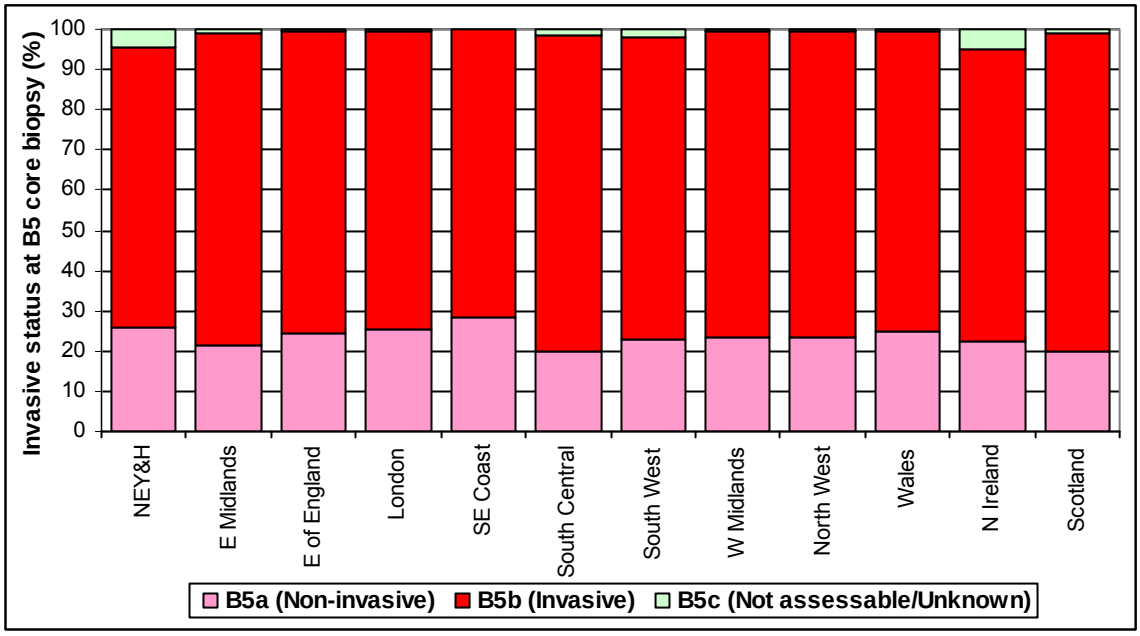

Figure 7 (Table 7): Variation in the proportion of cancers with B5a (Non-invasive), B5b (Invasive) and B5c (Not Assessable or Unknown) core biopsy, expressed as a percentage of cancers diagnosed by core biopsy

2.1.4 Invasive Status at Core Biopsy Compared with Invasive Status of Surgical Specimen

The majority of cancers diagnosed by core biopsy go on to have surgery, at which a definitive invasive status is determined. 30 of the 3,383 cancers with a B5a (Non-invasive) non-operative diagnosis had no surgery and 2 had unknown surgery, so the non-operative diagnosis of non-invasive cancer was retained. Of the remaining 3,351 cases, 2,456 (73%) had surgical confirmation of non-invasive cancer, 131 (4%) had a diagnosis of micro-invasive cancer at surgery. For 721 (22%) cancers, invasive disease was found at surgery. This varied from 17% in London to 29% in Northern Ireland. For 42 (1%) cases, no malignant disease was identified at surgery, but subsequent audit confirmed that a correct diagnosis of invasive cancer had been reported in the non-operative core biopsy. These cases are shown as "Benign" in Figure 8.

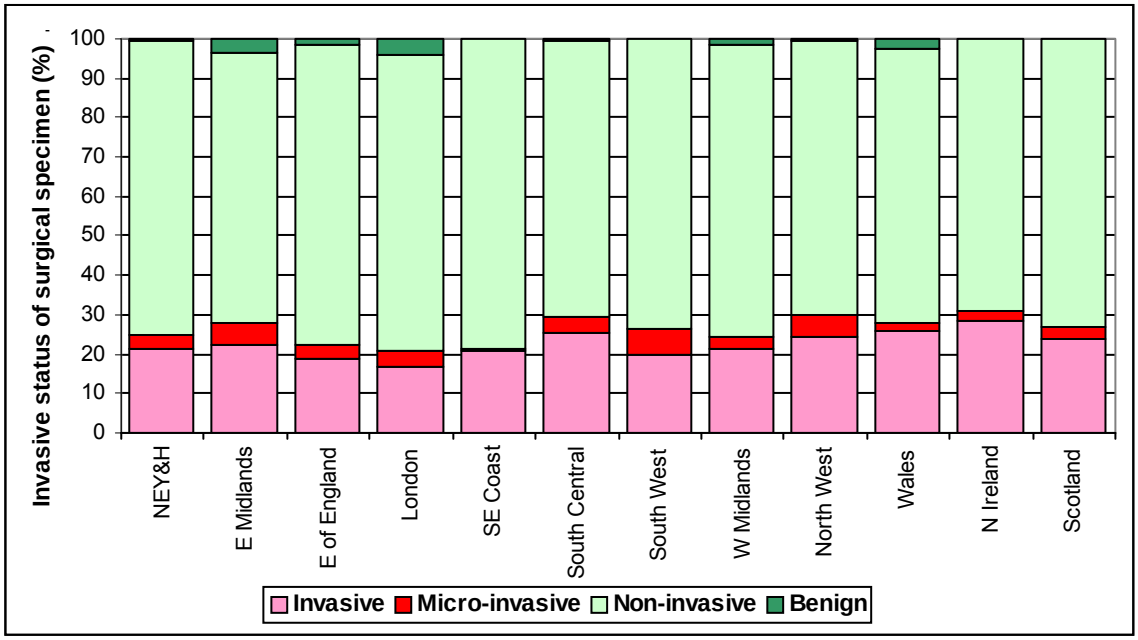

Figure 8 (Table 8): Variation in the invasive status at surgery of cases with a B5a (Non-invasive) non-operative diagnosis, expressed as a percentage of cancers diagnosed as B5a (Non-invasive)

Figure 9 shows the unit variation on the proportion of cancers with B5a (Non-invasive) diagnosis but later found to have invasive component in the surgical specimen, expressed as a percentage of

cancers diagnosed as B5a (Non-invasive). The dashed line is the upper control limit which approximates to the 98% confident interval of the average rate (solid line). The 4 screening units (open red diamonds) which are outside the upper control limit have rates significantly higher than the average rate of 22%. Regional QA reference centres should carry out audits with these 4 screening units to ascertain why the proportion of B5a (Non-invasive) cancers found to be invasive at surgery is unusually high.

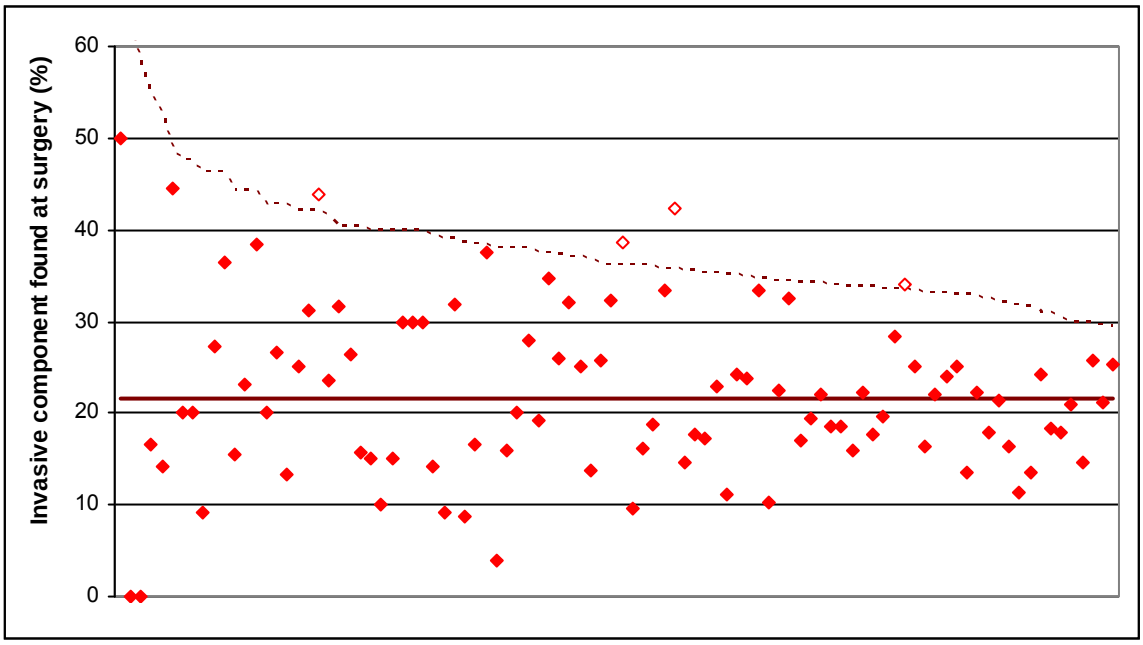

Figure 9: Variation with screening unit in the proportion of invasive cancers found at surgery of cases with a B5a (Non-invasive) non-operative diagnosis

Of the 10,769 cancers with a B5b (Invasive) non-operative diagnosis, 179 cases had no surgery and 21 cases had unknown surgical treatment. In the UK as a whole, 99% (10,484 cases) of the remaining 10,569 cases had surgical confirmation of invasive cancer. These data are shown for each region in Table 9. 67 cases with a B5b (Invasive) non-operative diagnosis were found to have non-invasive or micro-invasive cancer with no associated invasive disease in the surgical specimen. For 15 cases no malignant disease was identified at surgery, but subsequent audit confirmed that a correct diagnosis of invasive cancer had been reported in the non-operative core biopsy.

7 YEAR COMPARISON: INVASIVE STATUS FOLLOWING CORE BIOPSY

Year of data collection	*B5a (Non-invasive)*			*B5b (Invasive)*		
	Total	*Not non-invasive at surgery*		*Total*	*Not invasive at surgery*	
		No.	*%*		*No.*	*%*
2000/01	*1,660*	*482*	*29*	*5,026*	*63*	*1.3*
2001/02	*1,881*	*542*	*29*	*5,405*	*45*	*0.8*
2002/03	*2,274*	*635*	*28*	*6,743*	*69*	*1.0*
2003/04	*2,748*	*717*	*26*	*8,357*	*95*	*1.4*
2004/05	*2,750*	*666*	*24*	*8,999*	*46*	*0.5*
2005/06	*3,267*	*838*	*26*	*10,685*	*60*	*0.6*
2006/07	*3,351*	*895*	*27*	*10,569*	*85*	*0.8*

The preceding summary table shows that the proportion of cancers that had a B5a (Non-invasive) non-operative diagnosis but which were found to be “benign”, micro-invasive or invasive after surgery has fallen by 2% in the past 7 years (from 29% to 27%). The proportion in 2006/07 is slightly higher than in previous years, as cases found to be “benign” at surgery were not included in these data (42 cases in 2006/07) in earlier years. The proportion of cases with a B5b (Invasive) core biopsy which were not confirmed to be invasive following surgery has varied between 1.4% and 0.5% during the last 7 years.

2.1.5 Invasive Status of Cancers Diagnosed by C5 Cytology Only

648 cancers were diagnosed by C5 cytology alone. 7 of these cancers had no surgery. 96% of the 641 cancers diagnosed by C5 cytology alone with known surgical treatment were invasive. This varied between 40% in Scotland (2 cases) and 100% in Wales (3 cases), East Midlands (6 cases), West Midlands (49 cases) and South East Coast (91 cases) (Table 10). 20 cancers (3%) diagnosed by C5 cytology alone were non-invasive and none were micro-invasive. 2 cases were found to be benign at surgery.

COMMENTS:

- For 22% of cancers with a B5a (Non-invasive) non-operative diagnosis, invasive disease was found at surgery. This varied from 17% in London to 29% in Northern Ireland.
- For 4 screening units the proportion of cancers with B5a (Non-invasive) diagnosis later found to have invasive component was significantly higher than the average rate of 22%. Regional QA reference centres should carry out audits with these 4 screening units to ascertain the reason for these unusual results.
- 67 cases with a B5b (Invasive) non-operative diagnosis were found to have non-invasive or micro-invasive cancer with no associated invasive disease following surgery.
- For 42 cases with a B5a (Non-invasive) non-operative diagnosis and for 15 cases with a B5b (Invasive) non-operative diagnosis, no malignant disease was identified at surgery, but subsequent audit confirmed that a correct diagnosis of invasive cancer had been reported in the pre-operative core biopsy.
- 96% of the 641 cancers diagnosed by C5 cytology alone were found to be invasive after surgery.

2.2 Number of Visits for Core Biopsy/Cytology Procedures

It is possible that increases in non-operative diagnosis have led to more anxiety, with women having to return to the assessment clinic for repeat diagnostic tests before receiving a definitive diagnosis. Therefore, the number of visits at which a core biopsy/cytology procedure was undertaken in order to achieve a non-operative diagnosis was requested.

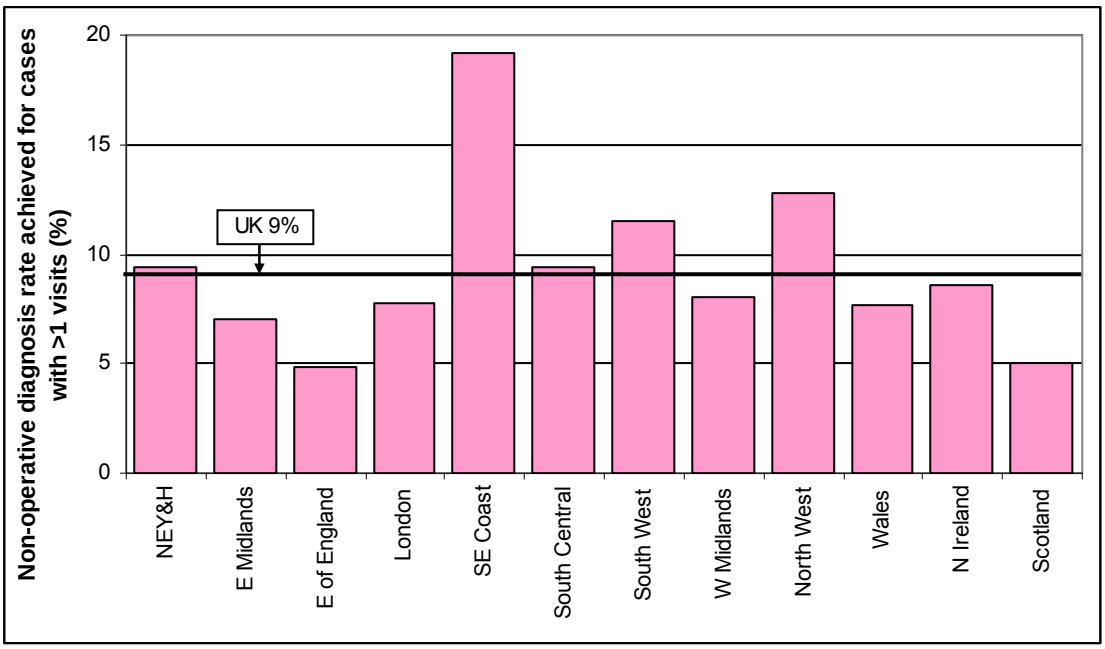

Figure 10 (Table 12): The non-operative diagnosis rate achieved by cancers which were diagnosed by C5 cytology and/or B5 core biopsy at more than 1 visit

The majority (89%) of women with screen-detected breast cancer had all attempts at core biopsy and/ or cytology performed at one assessment clinic visit (Table 11). Figure 10 shows how the non-

operative diagnosis rates in each region were affected by repeat visits to an assessment clinic. In the UK as a whole, 9% of the 15,856 cancers included in the audit only achieved a non-operative diagnosis of cancer after more than one assessment clinic visit. This varied between 19% in South East Coast and 5% in East of England.

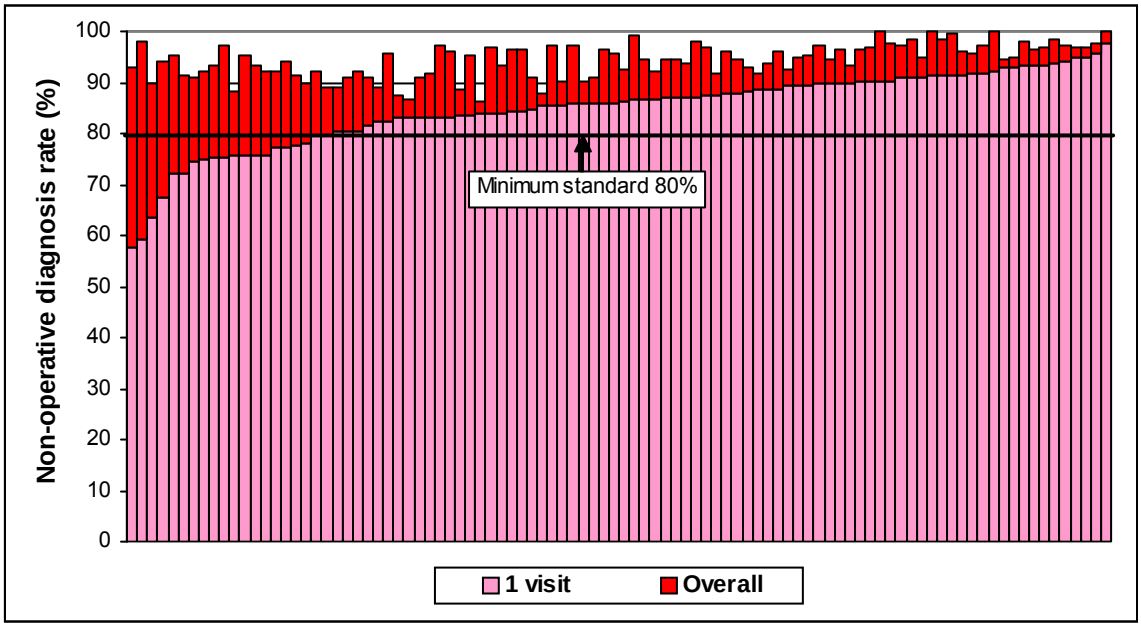

Figure 11: Variation in overall non-operative diagnosis rate and the non-operative diagnosis rate achieved by cancers diagnosed at 1 visit, presented as a proportion of all screen detected cancers in each screening unit

Figure 11 illustrates the ability of individual screening units to achieve a definitive non-operative diagnosis at one assessment visit. 18 screening units did not achieve the 80% non-operative diagnosis minimum standard at one visit and 4 units failed to achieve a non-operative diagnosis rate of 70% at the first visit. Regional QA reference centres should carry out audits with the 4 screening units where the proportion of non-operative diagnoses achieved at the first assessment visit was below 70%.

COMMENTS:

- 89% of women had all attempts at core biopsy and/or cytology performed at one assessment clinic visit.
- 18 screening units failed to achieve the 80% non-operative diagnosis minimum standard at one visit and 4 units failed to achieve a non-operative diagnosis rate of 70% at the first visit. Regional QA reference centres should carry out audits with these 4 screening units.

2.3 Diagnostic Open Biopsies

2.3.1 Status of Diagnostic Open Biopsies

Quality Objective	**To minimise unnecessary surgery (ie open surgical biopsies that prove to be benign)**
Outcome Measure	**Benign open diagnostic biopsies should be: <15 per 10,000 prevalent screen <10 per 10,000 incident screen**

(Quality Assurance Guidelines for Surgeons in Breast Cancer Screening, NHSBSP Publication No 20, November 2003)

Figure 12 shows the regional variation in benign and malignant diagnostic open biopsy rates. In the

UK as a whole, 2,699 diagnostic open biopsies were performed. Of these, 1,811 (67%) were benign and 888 (33%) were malignant.

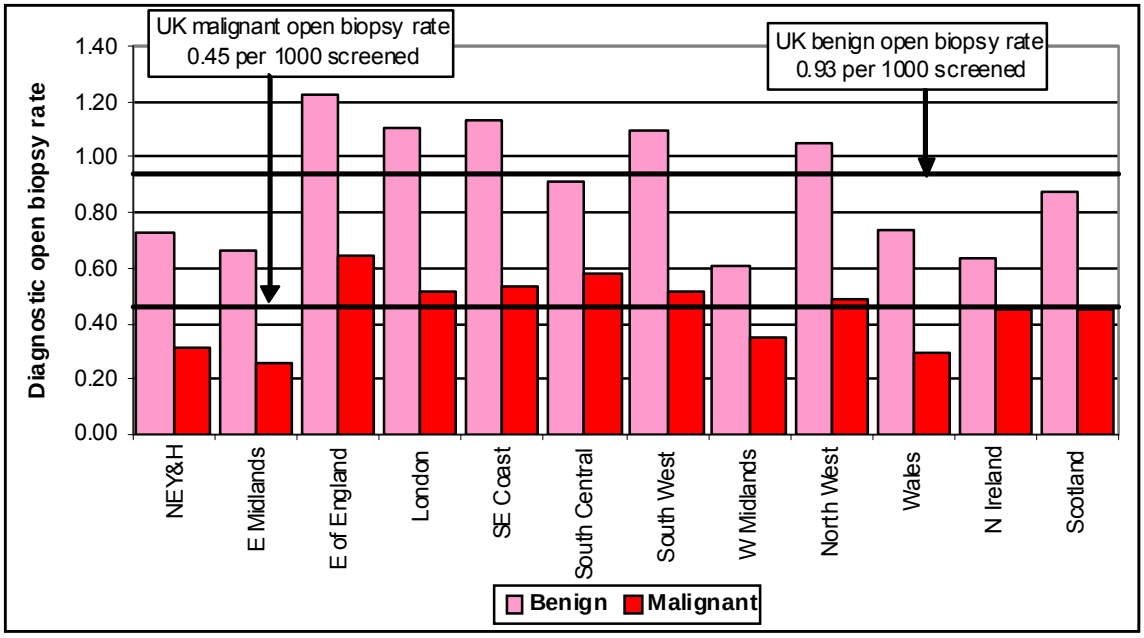

Figure 12 (Table 13): Variation in benign and malignant diagnostic open biopsy rates expressed as the number of diagnostic open biopsies undertaken per 1,000 women screened

The benign open biopsy rate was 0.93 per 1,000 women screened, varying from 0.61 per 1,000 screened in West Midlands to 1.23 per 1,000 screened in East of England. Overall, the malignant open biopsy rate was 0.45 per 1,000 women screened, varying from 0.26 per 1,000 screened in East Midlands to 0.64 per 1,000 screened in East of England.

The following summary table shows that the benign open biopsy rate has fallen over 11 years from 1.50 per 1,000 women screened in 1996/97 to 0.93 per 1,000 screened in 2006/07. Over the same period, the malignant open biopsy rate has fallen from 2.04 per 1,000 women screened to 0.45 per 1,000 screened as the non-operative diagnosis rate has increased from 63% to 94%.

Table 14 shows the false positive cytology and core biopsy figures obtained from CQA and BQA reports for each region. In the UK as a whole, there were 4 false positive cytology cases and 22 false positive core biopsy cases recorded. All regional QA reference centres and their pathology QA co-ordinators should review these cases to ascertain the reasons for these results, implementing corrective action as appropriate.

11 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*	*2,015*	*2,734*	*1.50*	*2.04*
1997/98	*1,419,287*	*2,251*	*2,349*	*1.59*	*1.66*
*1998/99**	*1,308,751*	*1,830*	*1,553*	*1.40*	*1.19*
*1999/00**	*1,429,905*	*1,838*	*1,316*	*1.29*	*0.92*
2000/01	*1,535,019*	*2,042*	*1,304*	*1.33*	*0.85*
2001/02	*1,507,987*	*2,018*	*1,148*	*1.34*	*0.76*
2002/03	*1,582,269*	*1,901*	*1,018*	*1.20*	*0.64*
2003/04	*1,685,661*	*1,825*	*952*	*1.08*	*0.56*
*2004/05**	*1,717,170*	*1,795*	*927*	*1.05*	*0.54*
2005/06	*1,942,449*	*1,847*	*944*	*0.95*	*0.49*
2006/07	*1,955,825*	*1,811*	*888*	*0.93*	*0.45*

*Data from Scotland are absent in 1998/99 and 1999/00. Data for 2 units from East of England are absent in 2004/05.

2.3.2 Non-operative Histories for Cancers Diagnosed by Diagnostic Open Biopsy

The number of cancers diagnosed by open biopsy has decreased from 944 in 2005/06 to 888 in 2006/07. Of the latter, 287 (32%) were invasive, 11 (1%) micro-invasive and 590 (66%) non-invasive (Table 15). 449 (51%) of the 888 cases did not have further surgical treatment after their diagnostic open biopsy. 21 cancers diagnosed by open biopsy were treated by mastectomy or mastectomy with axillary surgery as the first treatment. 6 of these were from London and 5 from South East Coast. Regional QA reference centres should ascertain the reason that mastectomies were performed as the first surgical operation for these women. Presumably, this is because radiological and clinical opinion was strongly supportive of the presence of malignant disease.

Tables 16 and 17 describe the non-operative history of cancers diagnosed by open biopsy according to whether the women had no non-operative cell or tissue sample, cytology only, core biopsy only or both cytology and core biopsy. For 73% of invasive cancers diagnosed by open biopsy there had been unsuccessful attempts to obtain a non-operative diagnosis using core biopsy alone (Table 16). For non-invasive cancers the proportion of cases where non-operative diagnosis had been attempted with core biopsy alone was higher at 88% (Table 17). Table 16 also shows that, of the 287 invasive cancers diagnosed by open biopsy, 13 (5%) had no non-operative procedure recorded and that, of the 590 non-invasive cancers diagnosed by open biopsy, 11 (2%) had no non-operative procedure recorded. Regional QA reference centres and regional QA surgeons should audit these 24 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 non-operative diagnosis should be ascertained.

7 YEAR COMPARISON :
NON-OPERATIVE HISTORY OF INVASIVE CANCERS DIAGNOSED BY OPEN BIOPSY

Year of data collection	Total Invasive cancers	Diagnosed by open biopsy	No non-operative procedure		Cytology only		Core biopsy only		Both cytology and core biopsy	
			No.	%	No.	%	No.	%	No.	%
2000/01	7,945	691	68	10	212	31	248	36	163	24
2001/02	7,911	558	50	9	129	23	240	43	139	25
2002/03	8,931	445	36	8	71	16	244	55	94	21
2003/04	10,400	412	25	6	56	14	268	65	63	15
2004/05*	10,849	351	17	5	43	12	242	69	49	14
2005/06	12,600	327	19	6	35	11	230	70	43	13
2006/07	12,491	287	13	5	30	10	210	73	34	12

* Data for 2 units from East of England are absent in 2004/05

The preceding 7 year summary table shows that, in line with the increased use of core biopsy since 2000/01, the proportion of cancers undergoing cytology as the only procedure prior to a diagnostic open biopsy has decreased from 31% to 10%, while the proportion undergoing core biopsy alone has risen from 36% to 73%.

Figure 13 shows the worst non-operative result for cancers without a non-operative diagnosis which were ultimately determined to be invasive. Overall, 10% of invasive cancers diagnosed by open biopsy (29 cases) had an inadequate (C1) cytology sample or a normal (B1) core biopsy sample. This varied from 0% in North East Yorkshire & Humber, East Midlands and Northern Ireland to 25% in Wales (3 cases). 6% had a benign result (C2/B2, 18 cases), 40% were suspicious of benign disease (C3/B3, 115 cases) and 39% were suspicious of malignant disease (C4/B4, 112 cases).

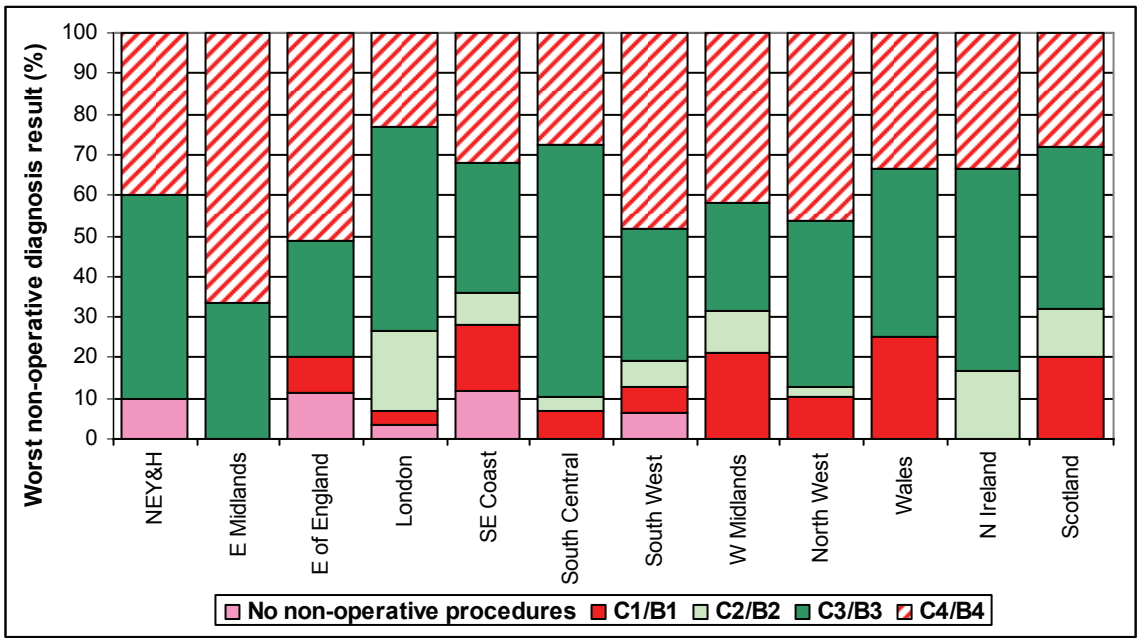

Figure 13 (Table 18): The worst non-operative diagnosis result for invasive cancers diagnosed by open biopsy, expressed as a percentage of invasive malignant diagnostic open biopsies

In East Midlands and East of England, over half of the invasive cancers diagnosed by open biopsy had a B4 core biopsy or C4 cytology result indicating suspicion of malignancy prior to diagnostic surgery. A similar result was recorded for East of England in 2005/06. The regional QA reference centres should audit the practice in their screening units to ascertain the reason for these unusual results, implementing corrective action as appropriate.

7 YEAR COMPARISON :
WORST CYTOLOGY AND CORE BIOPSY FOR MALIGNANT OPEN BIOPSIES (INVASIVE)

Year of data collection	Total with core biopsy/cytology	C1/B1		C2/B2		C3/B3		C4/B4	
		No.	%	No.	%	No.	%	No.	%
2000/01	623	134	22	93	15	111	18	285	46
2001/02	508	88	17	94	19	113	22	213	42
2002/03	409	68	17	54	13	98	24	189	46
2003/04	387	51	13	57	15	106	27	173	45
2004/05*	334	35	10	46	14	105	32	148	44
2005/06	308	32	10	31	10	111	36	134	44
2006/07	274	29	11	18	7	115	42	112	41

* Data for 2 units from East of England are absent in 2004/05

The preceding summary table shows that throughout the 7 year period studied, the highest proportion (41% - 46%) of invasive cancers diagnosed by malignant open biopsy were those with a C4 cytology or B4 core biopsy result. The proportion of invasive cancers with a C3 cytology or B3 core biopsy result has increased over the 7 year period from 18% to 42%, while the proportion with a C1 cytology or B1 core biopsy result has fallen from 22% to 11%.

Figure 14 shows the worst non-operative result for cancers without a non-operative diagnosis which were ultimately determined to be non-invasive. Overall, 36% of these non-invasive cancers had a C4 and/or B4 cytology or biopsy result (212 cases) and 55% had a C3 and/B3 non-operative result (322 cases). In Northern Ireland, 56% (5 cases) of the non-invasive cancers diagnosed by open biopsy were suspicious of malignant disease (C4/B4). The regional QA reference centre should audit practice to ascertain the reason for this unusual result, implementing corrective action as appropriate.

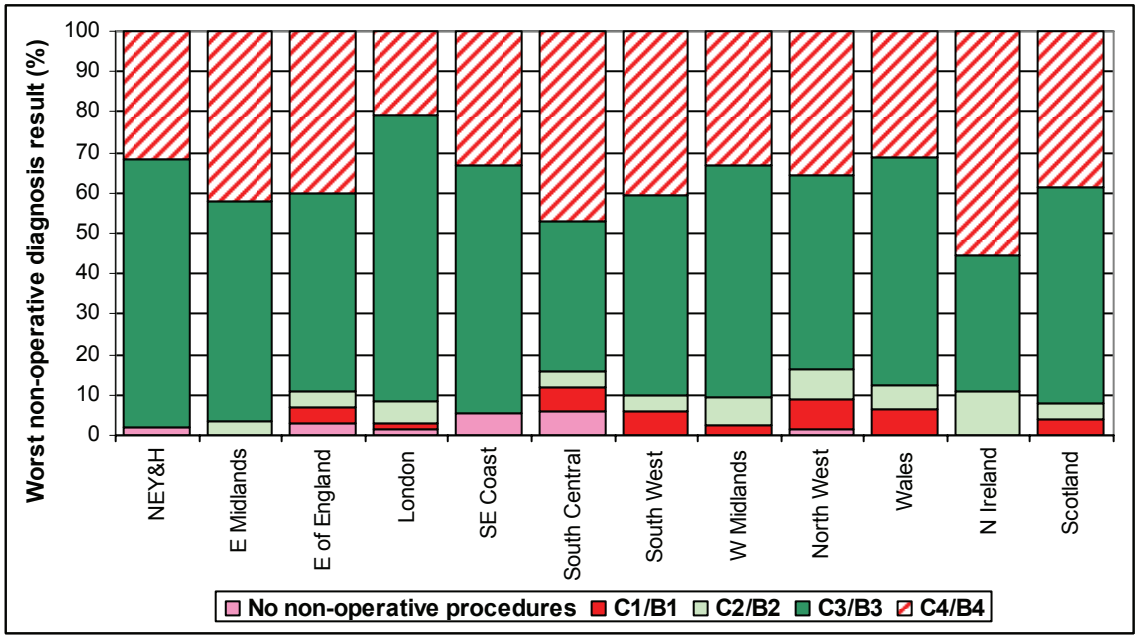

Figure 14 (Table 19): The worst non-operative diagnosis result for non-invasive cancers diagnosed by open biopsy, as a percentage of non-invasive malignant diagnostic open biopsies

The following summary shows that the proportion of non-invasive cancers diagnosed by malignant open biopsy which had a C3 cytology or B3 core biopsy result has increased over the 7 year period studied, from 27% in 2000/01 to 56% in 2006/07, while the proportion with a C1 cytology or B1 core biopsy result has fallen sharply from 20% to 3%.

7 YEAR COMPARISON :
WORST CYTOLOGY AND CORE BIOPSY FOR MALIGNANT OPEN BIOPSIES (NON-INVASIVE)

Year of data collection	Total with core biopsy/cytology	C1/B1		C2/B2		C3/B3		C4/B4	
		No.	%	No.	%	No.	%	No.	%
2000/01	571	112	20	81	14	157	27	221	39
2001/02	543	81	15	70	13	181	33	211	39
2002/03	543	68	13	54	10	204	37	217	40
2003/04	505	47	9	45	9	205	41	208	41
2004/05*	542	28	5	39	7	282	52	193	36
2005/06	587	17	3	21	4	338	58	211	36
2006/07	579	20	3	25	4	322	56	212	37

*Data for 2 units from East of England are absent in 2004/05

COMMENTS:

- In the UK as a whole, 2,699 diagnostic open biopsies were performed in 2006/07. Of these 67% were benign and 33% were malignant.
- The benign open biopsy rate was 0.93 per 1,000 women screened in 2006/07. This rate varied between 0.61 per 1,000 screened in West Midlands and 1.23 per 1,000 screened in East of England.
- The malignant open biopsy rate has fallen from 2.04 per 1,000 women screened in 1996/97 to 0.45 per 1,000 women screened in 2006/07 as the non-operative diagnosis rate has increased from 63% to 94%.
- In the UK as a whole, there were 4 false positive cytology cases and 22 false positive core biopsy cases. Regional QA reference centres and their pathology QA co-ordinators should review these cases to ascertain the reasons behind these results.
- 21 cancers which were diagnosed by open surgical biopsy had a mastectomy as the first surgical operation. Regional QA reference centres should review these cases to ascertain the reasons behind these decisions.

COMMENTS:

- 13 invasive cancers and 11 non-invasive cancers diagnosed by open biopsy had no non-operative procedure recorded. Regional QA reference centres and regional QA surgeons should audit these 24 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 non-operative diagnosis should be ascertained.
- 39% of invasive cancers and 36% of non-invasive cancers diagnosed by malignant open biopsy following cytology or core biopsy performed during the assessment process had a C4 cytology or B4 core biopsy result indicating suspicion of malignant disease. Regional QA reference centres in East Midlands, East of England and Northern Ireland should audit these cases to ascertain why they have particularly high proportions of open biopsies with a C4 and/or B4 non-operative result.

CHAPTER 3
SURGICAL TREATMENT

3.1 Treatment for Non-invasive and Micro-invasive Breast Cancers

The variation in treatment type for non-invasive and micro-invasive breast cancers in each region is shown in Figure 15. 30 cancers (1%) apparently received no surgery. Regional QA reference centres and regional QA surgeons should review the data for these cases to ensure that invasive disease has not been left untreated. Overall, 70% of non-invasive and micro-invasive cancers were treated with conservation surgery, varying from 62% in East Midlands to 74% in South Central.

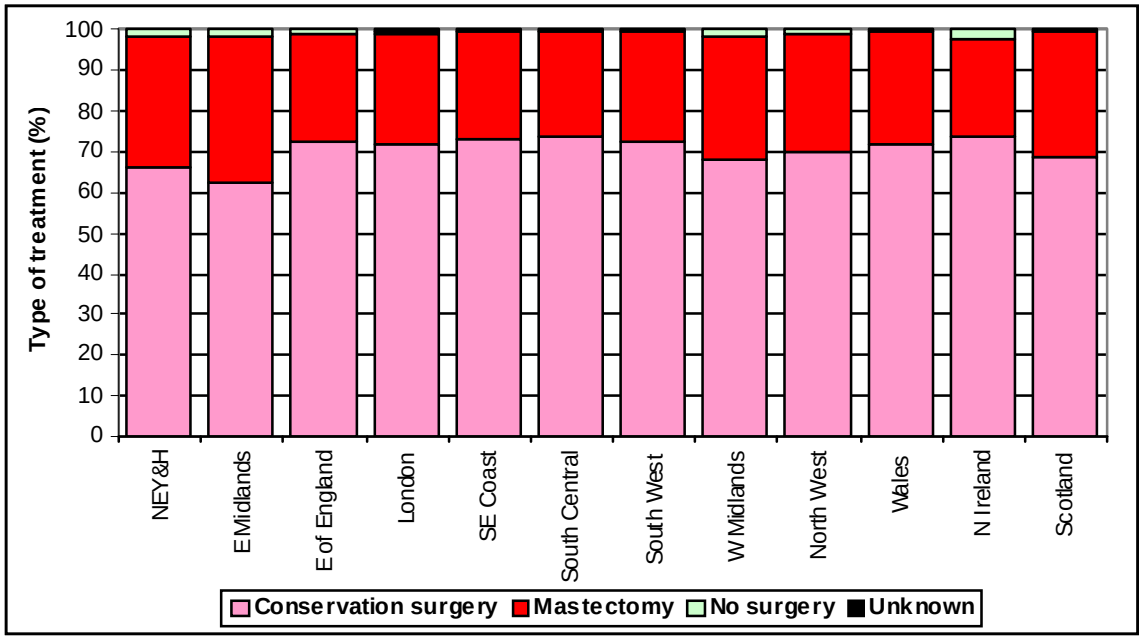

Figure 15 (Table 20): Variation in treatment for non-invasive and micro-invasive cancers

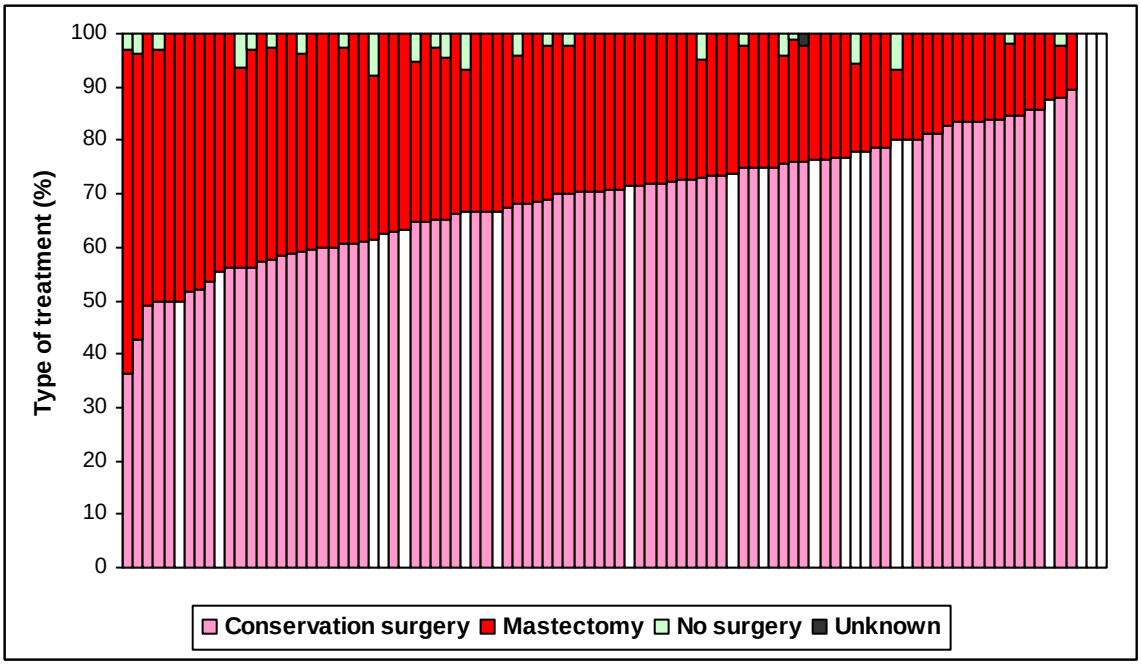

Figure 16: Variation in treatment for non-invasive and micro-invasive cancers in each screening unit. The 20 smallest units are highlighted in white

In Figure 16, the 20 smallest screening units by the number of women screened are highlighted in white. Conservation surgery rates in individual screening units varied between 36% and 100%. The 3 small units with 100% conservation surgery treated a total of 4, 6 and 10 non-invasive or micro-invasive cancers in the audit period.

3.2 Cytonuclear Grade and Size for Non-invasive Breast Cancers

In the UK as a whole, 1,857 (59%) of the 3,155 surgically treated non-invasive cancers had high cytonuclear grade, 786 (25%) had intermediate cytonuclear grade, 320 (10%) had low cytonuclear grade and for 130 (4%) the cytonuclear grade was not assessable (Table 21). Of the 62 non-invasive cancers with unknown cytonuclear grade, 23 (37%) were in London. The variation in the cytonuclear grade of non-invasive cancers in each screening unit is shown in Figure 17. The two units with the greatest proportion of high cytonuclear grade cancers treated 10 and 105 non-invasive cases in the audit period.

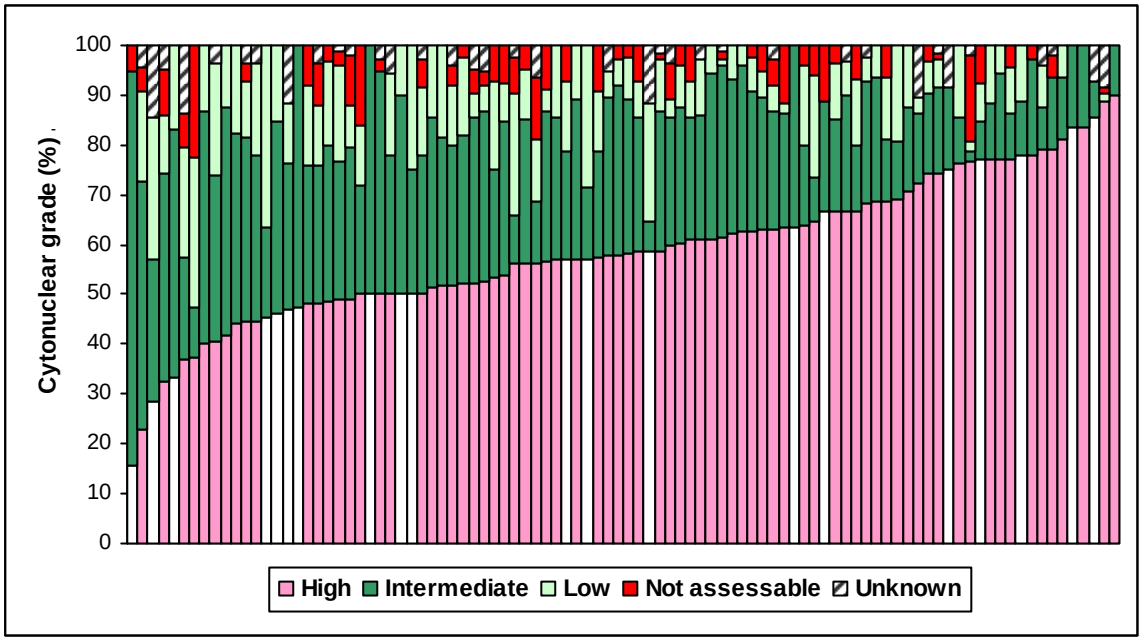

Figure 17: Variation in the cytonuclear grade of non-invasive cancers in each screening unit. The 20 smallest units are highlighted in white. (no surgery cases excluded)

7 YEAR COMPARISON: DATA COMPLETENESS FOR SURGICALLY TREATED NON-INVASIVE CANCERS (%)

Year of data collection	*Unknown cytonuclear grade*	*Unknown size*	*Unknown cytonuclear grade and/or size*
2000/01	*6*	*11*	*14*
2001/02	*10*	*13*	*19*
2002/03	*10*	*14*	*20*
2003/04	*3*	*11*	*11*
*2004/05**	*2*	*7*	*7*
2005/06	*3*	*7*	*8*
2006/07	*2*	*6*	*7*

* Data for 2 units from East of England are absent in 2004/05.

The preceding summary table shows that in the UK as a whole, data completeness for non-invasive cancers has improved markedly since 2000/01. Figure 18 shows how the unknowns for non-invasive cancers varied between screening units, for cases that were surgically treated.

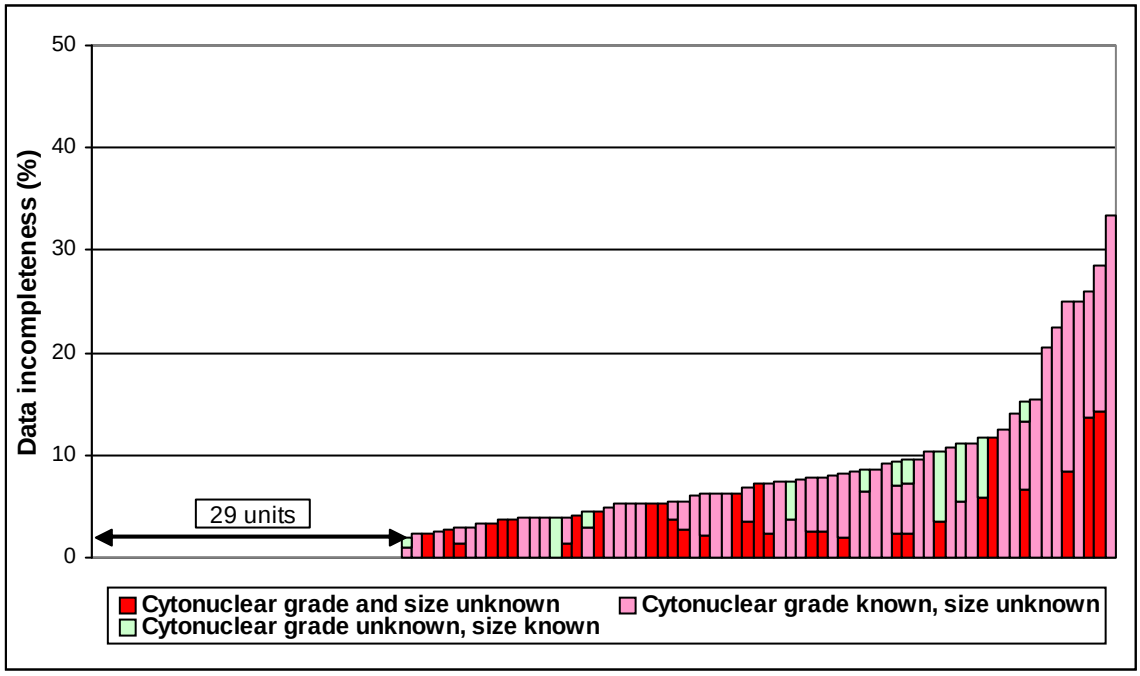

Figure 18: Variation in the data incompleteness of cytonuclear grade and size for non-invasive cancers in each screening unit (no surgery cases excluded)

Although 61 units were able to supply the cytonuclear grade for all their cases, only 29 units had complete cytonuclear grade and size. Overall, data were incomplete (unknown cytonuclear grade and/or size) for 208 (7%) of all surgically treated non-invasive cancers. Data incompleteness varied from 3% in South Central to 14% in London (Table 23). Regional QA reference centres should identify which of their screening units are participating in the Sloane Project to ascertain if their practices and procedures could be used to improve data quality in other units. In addition, screening units which already have high quality data should be encouraged to participate in the Sloane Project. It is hoped that data completeness will further improve as screening units continue to sign up to the Sloane Project.

In 2006/07, 41% of the 3185 non-invasive cases are recorded as less than 15mm (Table 22). The size of 94 cases (3%) is not assessable. 334 non-invasive cancers were recorded as large (40+mm), high cytonuclear grade lesions (Table 26). Of these, 59 (18%) were treated with conservation surgery.

NUMBER OF NON-INVASIVE CANCERS TREATED WITH CONSERVATION SURGERY

	40+mm		*Unknown size*		
Region	***High cytonuclear grade*** *(Table 26)*	***Unknown cytonuclear grade***	***High cytonuclear grade*** *(Table 24)*	***Unknown cytonuclear grade*** *(Table 25)*	***Total****
N East, Yorks & Humber	*6*	*0*	*5*	*0*	*11*
East Midlands	*6*	*0*	*0*	*0*	*6*
East of England	*2*	*0*	*2*	*3*	*7*
London	*6*	*0*	*4*	*11*	*21*
South East Coast	*5*	*0*	*3*	*0*	*8*
South Central	*4*	*0*	*1*	*3*	*8*
South West	*9*	*0*	*6*	*0*	*15*
West Midlands	*8*	*0*	*0*	*1*	*9*
North West	*5*	*0*	*1*	*3*	*9*
Wales	*3*	*0*	*3*	*0*	*6*
Northern Ireland	*3*	*0*	*1*	*1*	*5*
Scotland	*2*	*0*	*0*	*2*	*4*
United Kingdom	***59***	***0***	***26***	***24***	***109***

*Each non-invasive cancer is counted once only; cases with benign histology at surgery are excluded

The preceding summary table shows that, in total, 109 potentially large, high cytonuclear grade or unknown cytonuclear grade non-invasive cancers were treated with conservation surgery. Regional QA reference centres and regional QA surgeons should review the data recorded for these cases to ensure that they were not under-treated.

COMMENTS:

- Overall, 70% of non-invasive and micro-invasive cancers were treated with conservation surgery, varying from 62% in East Midlands to 74% in South Central.
- In 2006/07 only 7% of non-invasive cancers had an unknown cytonuclear grade and/or size. The completeness of cytonuclear grade and size data has improved since 2000/01, possibly because of increased participation in the Sloane Project. Regional QA reference centres should identify which of their units are submitting cases to the Sloane Project and encourage others to do so.
- 109 potentially large high cytonuclear grade non-invasive cancers were treated with conservation surgery. Regional QA reference centres and regional QA surgeons should review the data recorded for these cases to ensure that they were not under-treated.

3.3 Treatment for Invasive Breast Cancers

Of the 12,491 invasive breast cancers detected by the UK NHSBSP in 2006/07, 9,008 (72%) underwent conservation surgery, 3,283 (26%) had a mastectomy and 179 cases (1%) had no surgery. Treatment information was unavailable for 21 cases, of which 10 (48%) were in North East Yorkshire & Humber, 9 (43%) were in London and 2 were in Scotland (10%). The QA reference centres in these regions should ascertain why these data were not available. Figure 19 shows the regional variation in invasive cancer mastectomy rates which ranged from 22% in South West to 31% in East Midlands and Northern Ireland. Mastectomy rates in individual screening units varied between 13% and 47%.

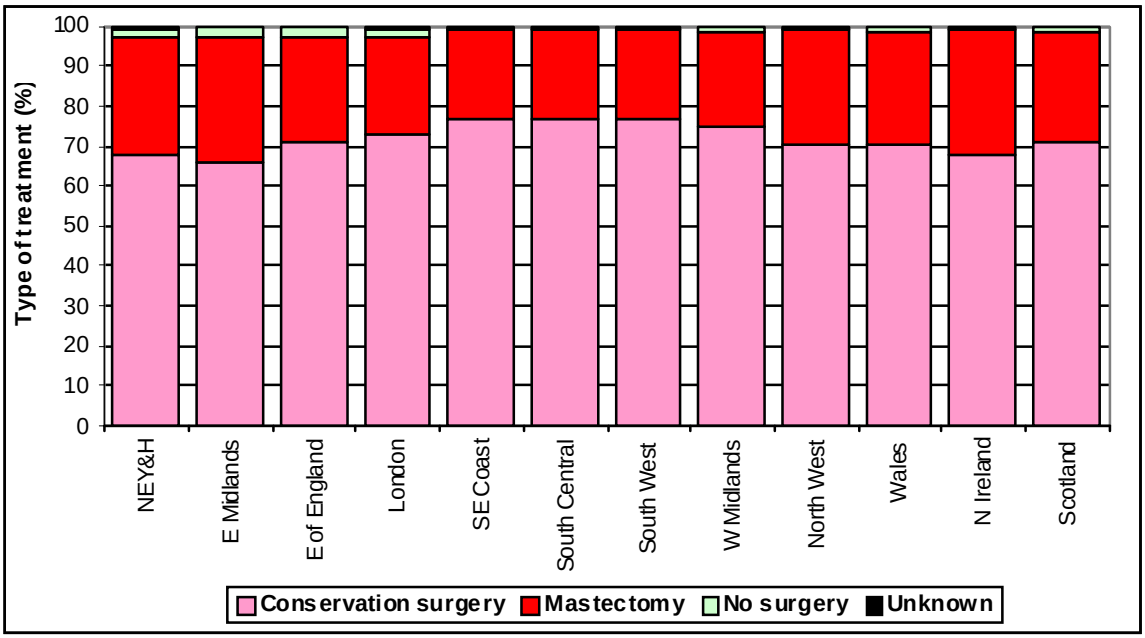

Figure 19 (Table 27): Variation in the type of treatment for invasive cancers (all sizes)

3.3.1 Treatment of Invasive Cancers According to Invasive Size

Of the 12,491 invasive cancers, 3,076 (25%) measured less than 10mm in diameter, 3,491 (28%) were 10-<15mm in diameter, 2,383 (19%) were 15-<20mm in diameter and 2,970 (24%) were 20-<50mm in diameter. Only 234 cases (2%) were 50mm or more in diameter (Table 28). For the 337 cases with unknown size, 179 had no surgery and 74 had non-invasive, micro-invasive, or benign histology at surgery.

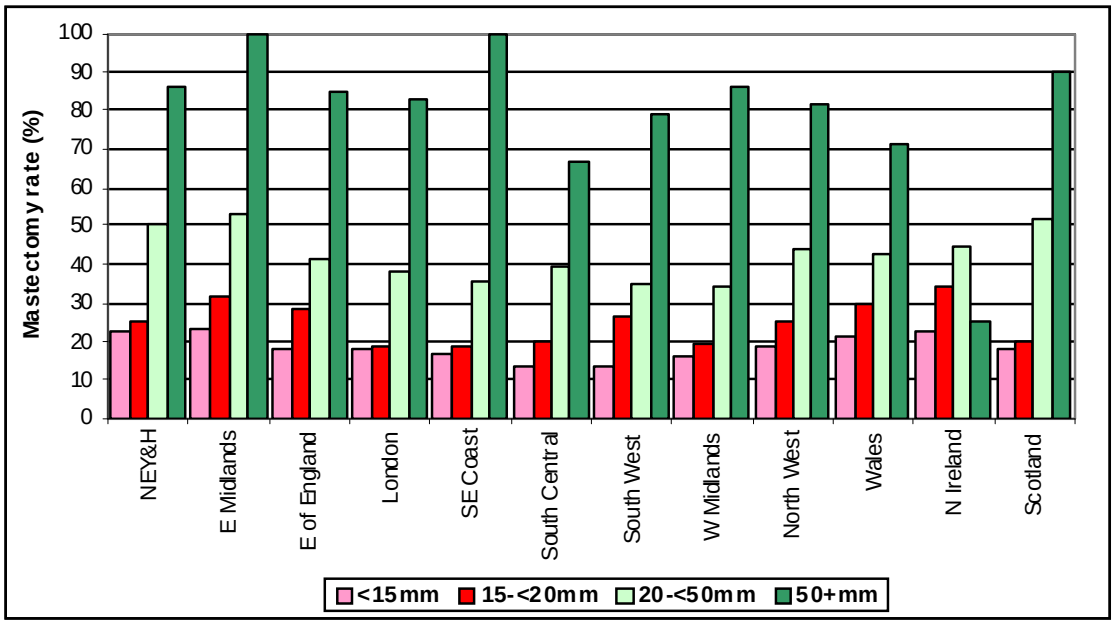

Figure 20 (Table 29): Variation in mastectomy rates with invasive tumour size

In most regions there was a clear variation in mastectomy rate with tumour size. South Central and Northern Ireland had relatively low mastectomy rates for cancers with invasive size 50mm or above, with only 67% and 25% (1 case) of cancers respectively treated with mastectomy compared to 83% in the UK as a whole. Regional QA reference centres should investigate whether this reflects a data collection problem relating to second operations or whether the data do indeed represent clinical practice.

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

The following summary table shows that the overall mastectomy rate for small (<15mm) invasive cancers has remained fairly stable since 1996/97, varying between 18% and 21%. Table 29 shows that the highest mastectomy rates for small (<15mm) invasive cancers were seen in East Midlands (24%) and the lowest rates (14%) in South Central and South West.

11 YEAR COMPARISON:
TREATMENT FOR SMALL INVASIVE CANCERS (invasive size <15mm)

Year of data collection	*Total invasive cases <15mm*	*Conservation surgery*		*Mastectomy*	
		No.	*%*	*No.*	*%*
1996/97	*3,135*	*2,449*	*78*	*601*	*19*
1997/98	*3,384*	*2,693*	*80*	*651*	*19*
*1998/99**	*3,344*	*2,697*	*81*	*618*	*18*
1999/00	*4,150*	*3,337*	*80*	*773*	*19*
2000/01	*4,189*	*3,363*	*80*	*796*	*19*
2001/02	*4,233*	*3,333*	*79*	*879*	*21*
2002/03	*4,878*	*3,950*	*81*	*918*	*19*
2003/04	*5,489*	*4,475*	*82*	*1,006*	*18*
2004/05	*5,795*	*4,723*	*82*	*1,071*	*18*
2005/06	*6,678*	*5,424*	*81*	*1,254*	*19*
2006/07	*6,567*	*5,359*	*82*	*1,208*	*18*

*Data from Scotland are absent in 1998/99

3.3.3 Treatment of Invasive Cancers According to Whole Tumour Size

The whole tumour size is the maximum diameter of the whole tumour, including any non-invasive component. The whole tumour size was not provided for 400 (3%) of the 12,491 invasive cancers (Table 30). 100 (25%) of the cancers without a whole tumour size were in London, 49 (12%) were in

East of England and 43 (11%) were in North East Yorkshire & Humber. In Northern Ireland, 10% of the invasive cancers did not have whole tumour size provided. The QA reference centres in these regions should ascertain why these important data were not available from their screening units.

Table 31 shows the whole tumour size of small (<15mm) invasive cancers. Of the 6,567 invasive cancers with invasive size <15mm, 4,918 (75%) had whole tumour size <15mm, 623 (9%) had whole tumour size 15-<20mm, 797 (12%) had whole tumour size 20-<50mm and 167 (3%) had whole tumour size 50+mm. Whole tumour size was unknown for 62 cancers (1%). 33 (53%) of these cancers were in London.

INVASIVE CANCER TREATMENT - NUMBER AND RATE OF MASTECTOMIES

Size	***Invasive size*** *(Table 29)*		***Whole tumour size for cancers with invasive component <15mm*** *(Table 32)*	
	No.	***%***	***No.***	***%***
50+mm	*195*	*83*	*143*	*86*
20-<50mm	*1,263*	*43*	*306*	*38*
15-<20mm	*571*	*24*	*115*	*18*
<15mm	*1,208*	*18*	*626*	*13*

The preceding summary table shows how mastectomy rates varied with the size of the invasive cancer and with whole tumour size. The mastectomy rate for 50+mm invasive cancers (83%) was slightly lower than that for <15mm cancers with a whole tumour size of 50+mm (86%). However, mastectomy rates for cancers with invasive size 20-<50mm and 15-<20mm were higher than for <15mm invasive cancers where the whole tumour size was 20-<50mm and 15-<20mm respectively. For small cancers, only 13% of cancers with whole tumour size <15mm were treated with mastectomy compared with 18% of cancers with an invasive size of <15mm. These data indicate that the presence of *in situ* disease accounts for a proportion of the mastectomies performed on cancers with invasive size <15mm.

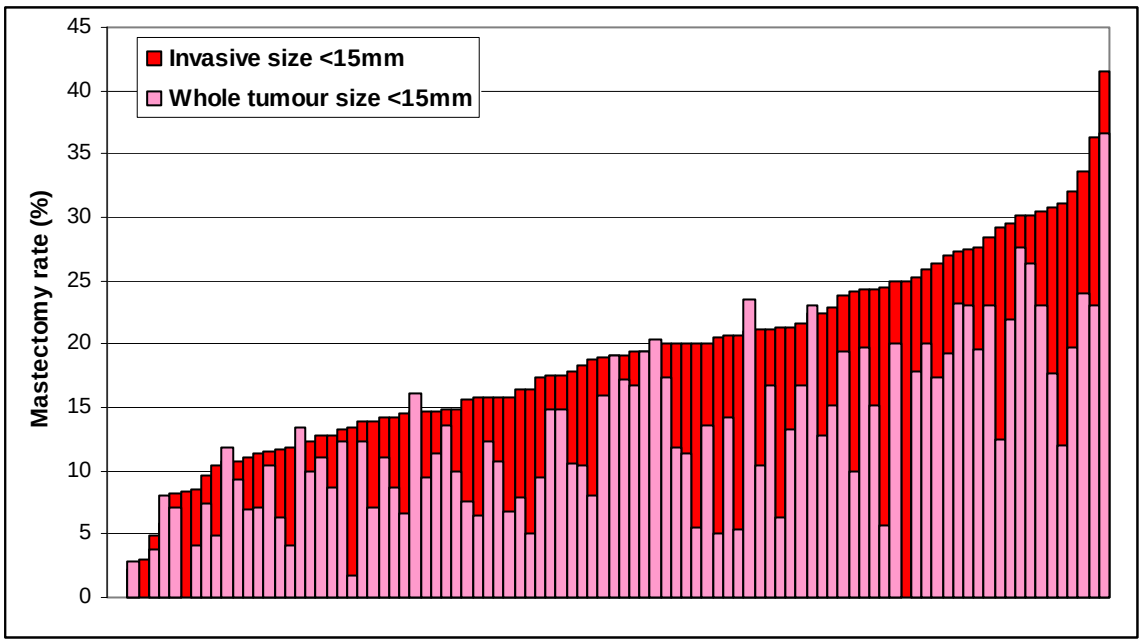

Figure 21: Variation in the mastectomy rates for cancers with an invasive size <15mm and for cancers with a whole tumour size <15mm in each screening unit. Screening units have been ranked according to their mastectomy rate for cancers with an invasive size <15mm

Tables 29 and 32 show that in every region, the mastectomy rate for cancers with whole tumour size <15mm was lower than that for cancers with an invasive size <15mm. The difference was greatest in Northern Ireland (22% compared to 13%) and North East Yorkshire & Humber (22% compared to 14%), and least in South West (14% compared to 10%), North West (19% compared to 15%) and

Wales (21% compared to 17%). Figure 21 compares the mastectomy rates in each screening unit for cancers with whole a tumour size <15mm and those for cancers with invasive size <15mm. In all but 8 screening units, the mastectomy rate for cancers with a whole tumour size <15mm was higher than that for cancers with an invasive size <15mm. In 4 screening units the mastectomy rates were the same for the two groups of cancers.

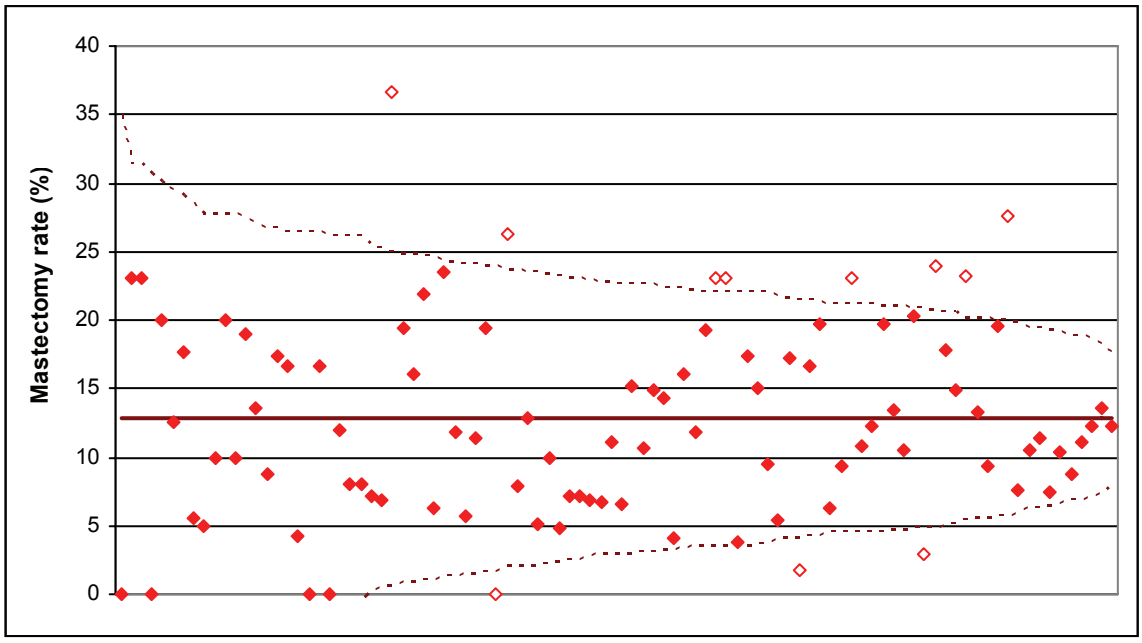

Figure 22: Variation in the mastectomy rates for cancers with a whole size <15mm in each screening unit (open diamond shapes represent units which lie outside the control limits)

Figure 22 uses a control chart to demonstrate the variation between screening units in the mastectomy rates for invasive cancers with whole tumour size less than 15mm. The two dashed lines are the upper and lower control limits which approximate to the 95% confident intervals of the average mastectomy rate (solid line). The mastectomy rates which are outside the control limits are significantly higher (8 units) or lower (3 units) than the average rate of 13%. Regional QA reference centres and regional QA surgeons should review the data for all screening units lying outside (above and below) the control limits to ascertain the reasons for this non-random variation in clinical practice. In a unit from the West Midlands, 37% of the small cancers with whole tumour size <15mm had a mastectomy. None of these cases had immediate reconstruction. The role of patient choice in explaining the unusually high mastectomy rates for small cancers in this unit has been explored through a questionnaire sent to breast cancer patients attending the unit. Those choosing to have a mastectomy cited avoidance of further surgery, minimising worry about recurrence and avoidance of radiotherapy side effects as factors influencing their decision.

3.4 Immediate Reconstruction Following Mastectomy

Overall, of the 15,856 cancers detected, 4,257 (27%) were treated with mastectomy. Of these, only 535 (13%) were recorded as having immediate reconstruction. 3,151 (74%) cases had no immediate reconstruction recorded and for 571 (13%) cases it was unknown whether or not immediate reconstruction was performed. Information regarding delayed reconstruction was not collected. Figure 23 shows how recorded immediate reconstruction rates for all cancers treated with mastectomy varied with region. The highest recorded immediate reconstruction rates were in South East Coast (21%) and South West (20%) and the lowest in Northern Ireland (4%).

Table 34 shows that, of the 535 cases known to have had immediate reconstruction following mastectomy, 315 (59%) were invasive, 19 (4%) were micro-invasive and 201 (38%) were non-invasive. Thus, only 10% of the 3,283 invasive cancers treated with mastectomy (Table 27) had immediate reconstruction recorded compared with 23% of the 974 non-invasive and micro-invasive cancers treated with mastectomy (Table 20). For invasive cancers treated with mastectomy,

recorded immediate reconstruction rates varied from 3% in Scotland to 20% in South East Coast. For non-invasive cancers treated with mastectomy, recorded immediate reconstruction rates varied from 0% in Northern Ireland to 35% in West Midlands.

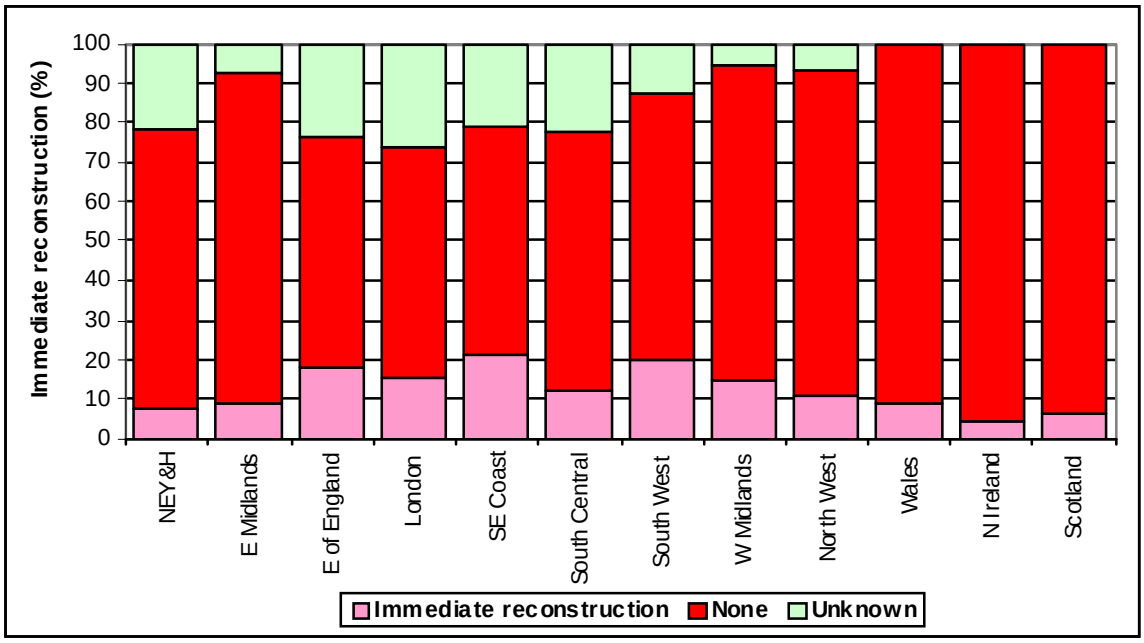

Figure 23 (Table 33): Proportion of cancers having immediate reconstruction after mastectomy

Figure 24 shows that recorded immediate reconstruction rates varied widely (from 2% to 92%) in individual screening units. There was no immediate reconstruction recorded in 18 screening units. Immediate reconstruction rates for all breast cancers are being audited in the National Breast Mastectomy and Breast Reconstruction Audit which is being co-ordinated by the Clinical Effectiveness Unit at the Royal College of Surgeons. Prospective data collection will be carried out by participating breast units during January to September 2008.

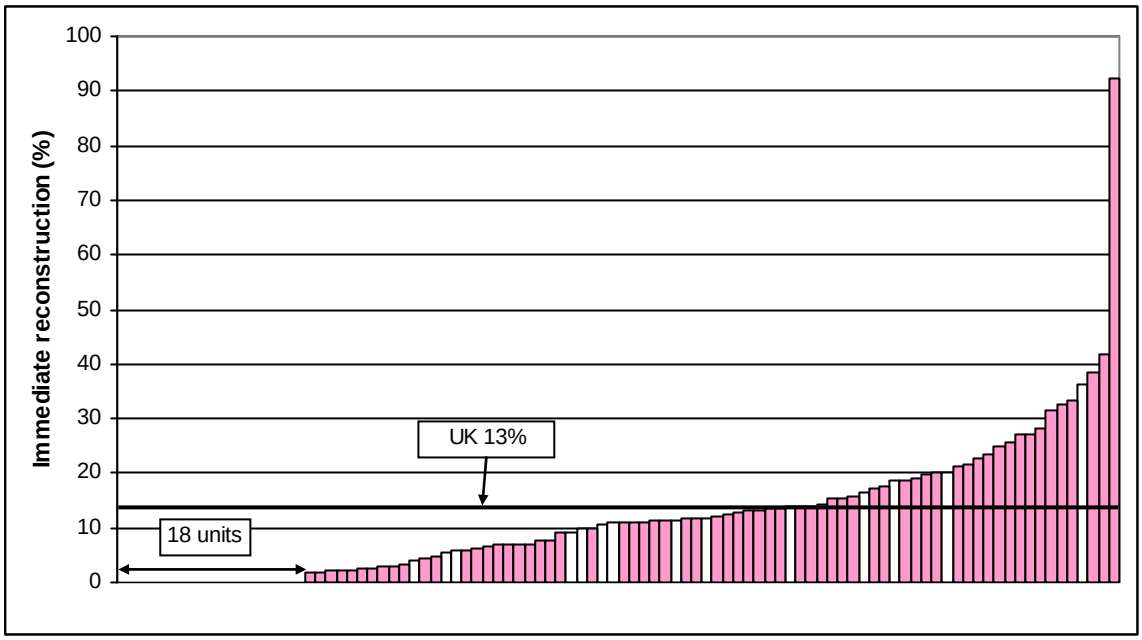

Figure 24: Variation in the proportion of immediate reconstruction in each screening unit. Smaller units are highlighted in white

COMMENTS:

- In the UK as a whole, the mastectomy rate for invasive cancers was 26%. This varied between 13% and 48% in individual screening units.
- 83% of 50+mm invasive cancers were treated with mastectomy compared with 18% of small (<15mm) invasive cancers. In most regions there was a clear variation in mastectomy rate with tumour size.
- South Central and Northern Ireland had relatively low mastectomy rates for cancers with invasive size 50mm or above, with only 67% and 25% of cancers respectively treated with mastectomy compared to 83% in the UK as a whole. Regional QA reference centres should investigate whether this reflects a data collection problem relating to second operations or whether the data do indeed represent clinical practice.
- Whole tumour size was not provided for 400 (3%) invasive cancers.
- 100 (25%) of the cancers without a whole tumour size were in London, 49 (12%) were in East of England and 43 (11%) were in North East Yorkshire & Humber. In Northern Ireland, 10% of their invasive cancers did not have whole tumour size provided. The QA reference centres in these regions should ascertain why these important data were not available from their screening units.
- Overall only 13% of cancers with a whole tumour size <15mm were treated with mastectomy compared with 18% of cancers with an invasive size <15mm. In all but 8 screening units, the mastectomy rate for cancers with a whole tumour size <15mm was higher than that for cancers with an invasive size <15mm and in 4 screening units the mastectomy rates were the same for the two groups of cancers. These data indicate that the presence of *in situ* disease accounts for a proportion of the mastectomies performed on tumours with an invasive size <15mm.
- In order to ascertain the reasons for non-random variation in clinical practice, regional QA reference centres and regional QA surgeons should review the data for all screening units lying outside (above and below) the control limits in Figure 22 which shows the inter-unit variation in the proportion of small cancers with whole tumour size <15mm which had a mastectomy.
- 13% of cancers treated with mastectomy were recorded as having immediate reconstruction. Of these cancers, 59% were invasive, 4% were micro-invasive, and 38% were non-invasive.
- Only 10% of invasive cancers treated with mastectomy were recorded as having immediate reconstruction compared with 23% of micro-invasive and non-invasive cancers treated with mastectomy.
- There was no immediate reconstruction recorded in 18 screening units. QA Reference centres should confirm whether or not these units are able to offer immediate reconstructive surgery.

CHAPTER 4
WAITING TIMES

The *NHS Cancer Plan*, which was published in 2000, sets out the goal that by 2001 no breast cancer patient should wait longer than one month from diagnosis to first treatment, and that by 2002 no patient should wait longer than two months between an urgent referral by their GP for suspected breast cancer and the start of treatment; the only exceptions being if there is a good clinical reason or personal choice.

The *NHS Cancer Plan* (September 2000) cancer waiting time targets:
- **31 days from decision to treat to first treatment**
- **62 days from urgent GP referral to first treatment**

In the NHSBSP Quality Assurance Guidelines for Surgeons in Breast Cancer Screening published in 1996, the following waiting time standards were set, some time before the introduction of the waiting times standards in the *NHS Cancer Plan*.

Quality Objective	**To minimise the interval from a surgical decision to operate for therapeutic purpose and the first offered admission date**
Outcome Measure	**More than 90% of breast cancer cases should be admitted within 3 weeks of informing the patient that she needs surgical treatment**

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

In November 2003, the revised version of the NHSBSP Quality Assurance Guidelines for Surgeons in Breast Cancer Screening set the following waiting time standards; the definitions for which are more consistent with the waiting time standards set in the *NHS Cancer Plan*.

Quality Objective	**To minimise any delay for women who require treatment for screen detected breast cancer**
Minimum Standard	**90% of women should be admitted for treatment within two months of the first assessment visit**
Target Standard	**100% of women should be admitted for treatment within two months of the first assessment visit**

(Quality Assurance Guidelines for Surgeons in Breast Cancer Screening, November 2003, NHSBSP Publication No 20)

The NHSBSP and ABS at BASO audit monitors the proportion of women being admitted for treatment within two months of their first assessment visit using the routine data available from the NBSS. Unfortunately, the NBSS cannot be used to calculate the waiting times defined in the *NHS Cancer Plan,* as the data items collected are different from those in the waiting times dataset. This dataset was developed by the Department of Health to track the patient journey from urgent GP referral for suspected cancer to first treatment, and from decision to treat date to the date of first treatment for patients coming through the non-urgent GP referral route. The analyses presented in this chapter provide an approximate indication of whether or not breast screening patients would have met the cancer waiting times targets. The data are provided only for cases which had a non-operative diagnosis (94% of the 15,856 cases included in the audit), as only these cases had the date of the first therapeutic operation recorded. Data for the 888 cases who did not have a non-operative

diagnosis are presented separately in Table 35. Cases with unknown screening, assessment or surgery dates are excluded.

In the UK as a whole, 94% of women had their first therapeutic treatment within 2 months of their first assessment visit, with a median waiting time of 29 days (Table 36). For cases which did not have a non-operative diagnosis, only 86% of women had their first diagnostic operation within 2 month of their first assessment visit, with a median waiting time of 36 days (Table 35). The longer waiting time seen for these patients is probably because there have usually been several attempts to obtain a non-operative diagnosis before their diagnostic surgery was carried out.

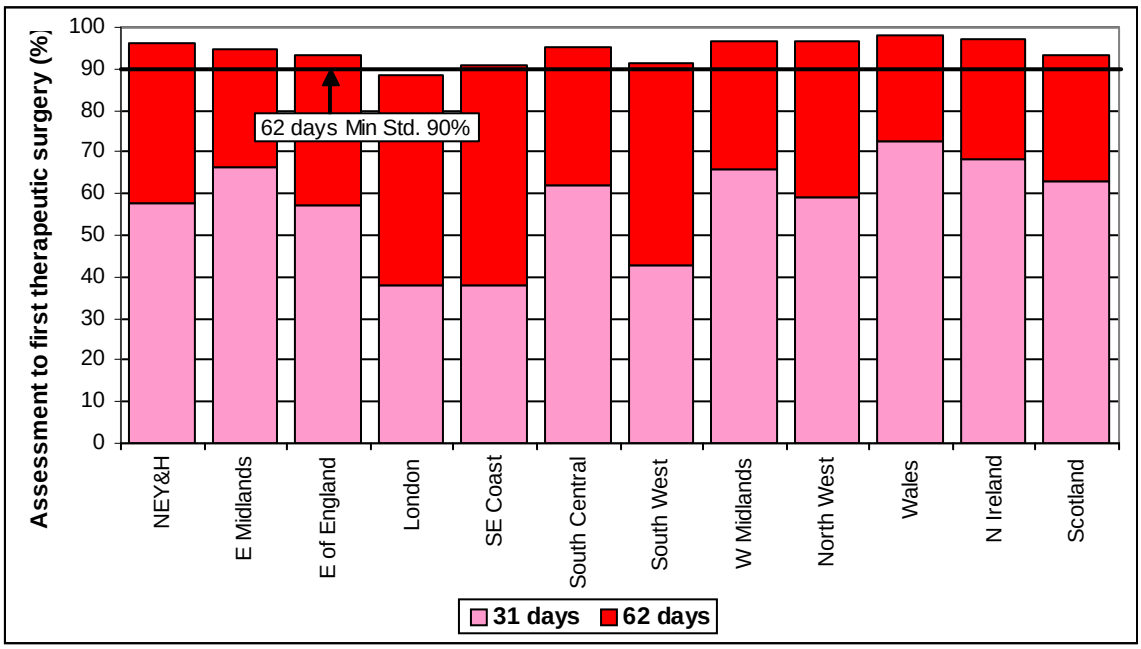

Figure 25 (Table 36) : Percentage of women who had their first therapeutic surgery within 31 days and 62 days of attending an assessment clinic

Figure 25 shows the proportion of women in each region who had their first therapeutic surgical operation within 31 days (1 month) or 62 days (2 months) of their first assessment visit. All regions except London met the 62 days minimum standard. In the UK as whole, 56% of the women had their first therapeutic treatment within 1 month of their first assessment visit. In East Midlands a 9% improvement in the proportion of women receiving their first surgery within 31 days of their first assessment visit was apparent compared with 2005/06. In Northern Ireland only 68% of women received their first surgery within 31 days of their first assessment visit compared with 82% in 2005/06.

Figure 26 shows the proportion of women in each region who had their first therapeutic surgical operation within 62 days of their screening visit. The proportion of women receiving their first therapeutic surgery within 62 days of their first assessment visit (as shown in Figure 25) has been included for comparison. In the UK as a whole, 73% of women had their first therapeutic surgery within 62 days (2 months) of their screening visit, with a median of 50 days. There is, however, considerably more variation between regions than is seen when waiting times from first assessment visit to first therapeutic surgery are compared. In London, only 53% of women received their first therapeutic surgery within 62 days of their screening visit. In West Midlands this figure was 87%. This variation is due to differences between regions in screen to assessment times.

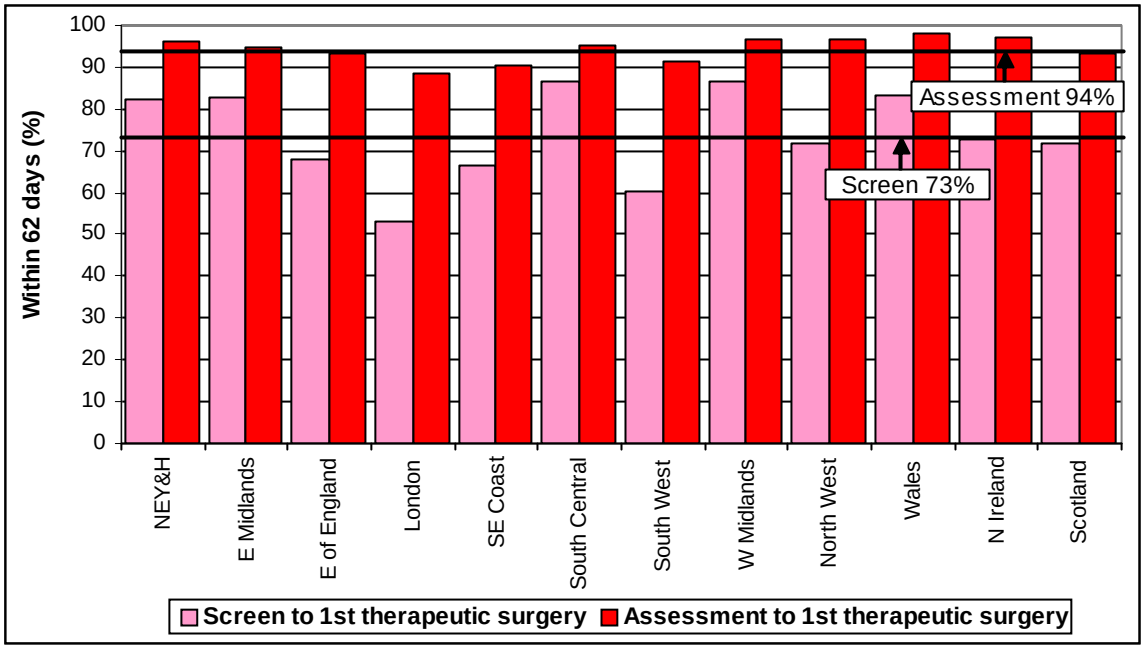

Figure 26 (Tables 36 & 37) : Percentage of women who had their first therapeutic surgery within 62 days of their screening or assessment visit

COMMENTS:

- 94% and 56% of the women had their first therapeutic treatment within 2 months and 1 month, respectively, of their first assessment visit.
- All regions except London met the minimum standard that 90% of women should have their first therapeutic treatment within 2 months of their first assessment visit.
- 73% of women had their first therapeutic surgery within 2 months of their screening visit. This varied between 53% in London and 87% in West Midlands.

CHAPTER 5
LYMPH NODE STATUS, INVASIVE GRADE AND NPI

179 invasive cancers and 30 non-invasive cancers which did not have surgery have been excluded from this chapter as no information was available concerning their lymph node status and grade.

5.1 Lymph Node Status for Invasive Cancers

Screening guidelines recommended that invasive cancers should have axillary node assessment. Axillary node assessment is not usually indicated for non-invasive cancers.

Quality Objective	**To ensure adequate pathological data to decide on appropriate adjuvant treatment**
Minimum Standard	**90% of patients with invasive cancers treated by surgery should have adequate axillary node assessment**
Target Standard	**95% of patients with invasive cancers treated by surgery should have adequate axillary node assessment**

(Quality Assurance Guidelines for Surgeons in Breast Cancer Screening, NHSBSP Publication 20, November 2003)

5.1.1 Availability of Nodal Status for Invasive Cancers

Overall, nodal status was known for 97% of surgically treated invasive cancers, varying from 95% in London and Northern Ireland to 99% in East Midlands, West Midlands, Wales, and Scotland (Table 38). In London and East of England, 50 (5%) and 47 (4%) invasive cancers respectively had either no nodes obtained or it was unknown if nodes had been obtained. In North East Yorkshire & Humber, 10 cases did not have a record of whether or not nodes were obtained.

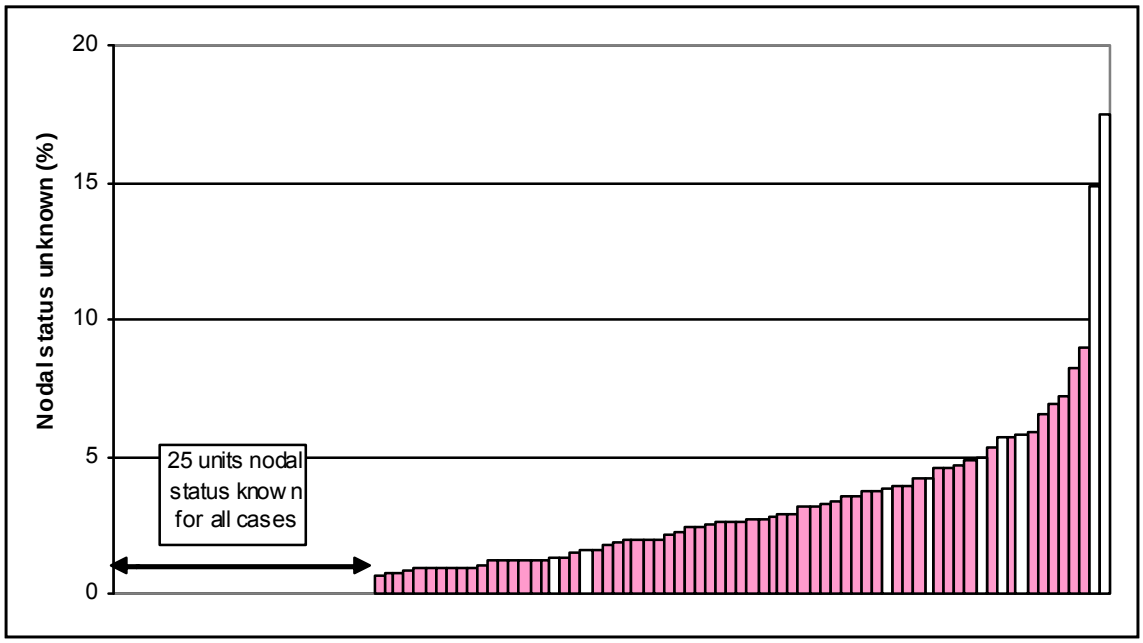

Figure 27: The availability of lymph node status for invasive breast cancers in each screening unit

The availability of nodal status for invasive cancers is shown for individual screening units in Figure

27. Where nodal status is unknown, this may be because no nodes were obtained, because it is not known whether or not nodes were obtained, or because the number of positive nodes was not recorded. Nodal status was ascertained for 100% of invasive cancers in 25 screening units. Two screening units in London have had more than 7% of cases with unknown nodal status for the last three years. Regional QA reference centres with screening units with more than 5% of cases with unknown nodal status should audit the cases to determine the reasons for the absence of these important data.

5.1.2 Number of Nodes Examined

Quality Objective

"Patients receiving surgery for screen-detected invasive breast cancer should be recommended to have axillary node staging by sampling or clearance, and this recommendation should be documented in their case notes. A minimum of four nodes should be obtained for axillary node sampling."

(Quality Assurance Guidelines for Surgeons in Breast Cancer Screening, NHSBSP Publication 20, November 2003)

The following summary table shows that the proportion of invasive cancers for which nodal status was recorded based on the examination of fewer than 4 nodes decreased from 10.6% in 1996/97 to 4.8% in 2003/04. In the most recent 3 years, this figure has started to rise again because of the increased use of sentinel lymph node procedures. When cases with sentinel lymph node biopsy are excluded, there is a continuous decrease in the proportion of cases with a nodal status based on the examination of fewer than 4 nodes. The number of women with less than four nodes taken without a sentinel lymph node procedure has dropped from 4.6% in 2005/06 to 3.1% in 2006/07.

11 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*		
		Overall	*With SLNB*	*Excluding SLNB*
1996/97	*4,773*	*10.6*	*-*	*10.6*
1997/98	*5,585*	*9.0*	*-*	*9.0*
*1998/99**	*5,574*	*6.7*	*-*	*6.7*
1999/00	*7,126*	*5.5*	*-*	*5.5*
2000/01	*7,379*	*5.0*	*-*	*5.0*
2001/02	*7,465*	*5.1*	*-*	*5.1*
2002/03	*8,607*	*5.2*	*-*	*5.2*
2003/04	*9,811*	*4.8*	*-*	*4.8*
*2004/05**	*10,322*	*8.6*	*4.1*	*4.5*
2005/06	*12,063*	*13.4*	*8.8*	*4.6*
2006/07	*11,993*	*19.1*	*16.0*	*3.1*

*Data from Scotland and Northern Ireland are absent in 1998/99. Data for 2 units from East of England are absent in 2004/05

5.1.3 Sentinel Lymph Node Biopsy Technique

For the 11,998 invasive cancers with axillary surgery, 4,544 (38%) had a sentinel lymph node procedure and 5,858 (49%) did not have a sentinel procedure (Table 39). The median numbers of nodes examined for cases with and without a sentinel lymph node procedure were 4 nodes and 8 nodes respectively (Table 40). There were 1,596 cases where the axillary lymph node procedure was not specified. 583 (37%) of these were from North East, Yorkshire & Humber and 756 (47%) from Scotland (Table 39). Regional QA reference centres should investigate why, for such a relatively high proportion of surgeons, it was not known whether or not a sentinel lymph node procedure had been performed.

The following table shows the predominant axillary technique used in 2006/07 by surgeons who had a caseload of 10 or more. In the UK as a whole, 40% of surgeons performed the full sentinel lymph node procedure using isotope and blue dye. This varied from 0% in Northern Ireland to 55% in South West. A further 40 surgeons (11%) carried out blue dye guided 4 node sampling. This was used by 33% of the surgeons in Wales. A small proportion of surgeons carried out a sentinel node procedure involving blue dye only (9%) or isotope only (1%). 79 surgeons (21%) did not carry out sentinel lymph node procedures in 2006/07 and utilised other axillary techniques such as clearance and sampling. In East of England, North West, Scotland and Northern Ireland, information on the predominant axillary technique used was not provided by more than 30% of surgeons. Regional QA reference centres should investigate why the predominant axillary technique was unknown for these surgeons with a greater than 10 caseload.

PREDOMINANT AXILLARY TECHNIQUE USED BY SURGEONS WITH A 10+ CASELOAD (%)

Region	Isotope and blue dye	Blue dye only	Isotope only	Blue dye guided 4 node sampling	*Other**	*Unknown*
N East, Yorks & Humber	*37*	*4*	*0*	*6*	*47*	*6*
East Midlands	*52*	*12*	*8*	*0*	*28*	*0*
East of England	*41*	*10*	*3*	*23*	*21*	*0*
London	*48*	*10*	*0*	*5*	*29*	*10*
South East Coast	*45*	*38*	*0*	*0*	*17*	*0*
South Central	*50*	*0*	*0*	*31*	*0*	*19*
South West	*55*	*5*	*0*	*5*	*18*	*16*
West Midlands	*46*	*5*	*0*	*18*	*31*	*0*
North West	*34*	*0*	*0*	*18*	*13*	*34*
Wales	*13*	*0*	*0*	*33*	*40*	*13*
Northern Ireland	*0*	*40*	*0*	*0*	*0*	*60*
Scotland	*33*	*15*	*0*	*0*	*0*	*52*
UK	***42***	***9***	***1***	***12***	***23***	***14***

*Other techniques includes sampling and clearance

5.1.4 Lymph Node Status

Of the 11,993 invasive cancers with known nodal status, 2,825 (24%) had positive nodes (Table 41). This is similar to the proportion in previous years.

7 YEAR COMPARISON: AVAILABILITY OF LYMPH NODE STATUS

Year of data collection	*Number of invasive cancers (with surgery)*	*% with nodal information*	*% of invasive cancers with positive nodal status*
2000/01	*7,938*	*93*	*25*
2001/02	*7,899*	*95*	*24*
2002/03	*9,068*	*96*	*25*
2003/04	*10,341*	*96*	*24*
*2004/05**	*10,888*	*97*	*23*
2005/06	*12,464*	*97*	*23*
2006/07	*12,312*	*97*	*24*

*Data for 2 units from East of England are absent in 2004/05.

There was some regional variation in lymph node status, with the proportion of node positive cancers varying from 21% in Wales to 28% in Northern Ireland (Table 41). A wider variation in nodal status was apparent in individual screening units as illustrated in Figure 28 where the proportion of positive nodes varied from 10% (52 cancers) to 38% (103 cancers).

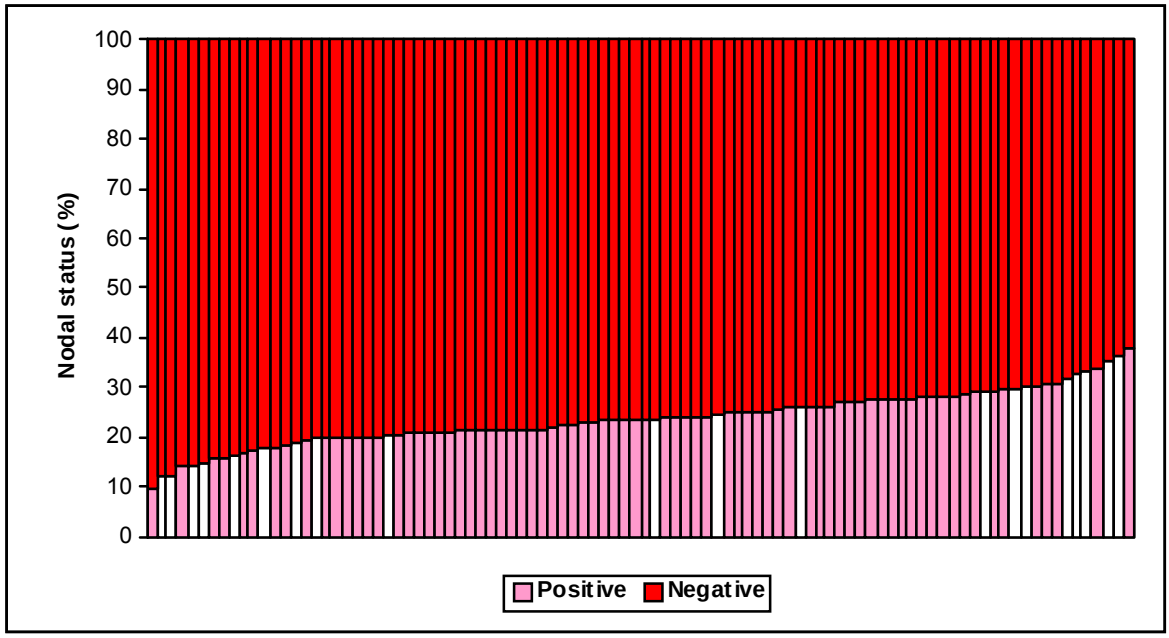

Figure 28: Variation in the lymph node status of invasive breast cancers in each screening unit

Overall, 344 (2.9%) of the invasive cancers for which nodal status was recorded had their negative nodal status determined on the basis of fewer than 4 nodes without a sentinel lymph node procedure. Figure 29 shows that this varied from 1.1% (12 cancers) in Scotland to 7.9% (51 cancers) in Wales. A further 1,818 cancers (15.2%) had their negative nodal status determined by a sentinel node procedure. This varied from 8.1% (90 cancers) in Scotland to 27.8% (251 cancers) in South Central.

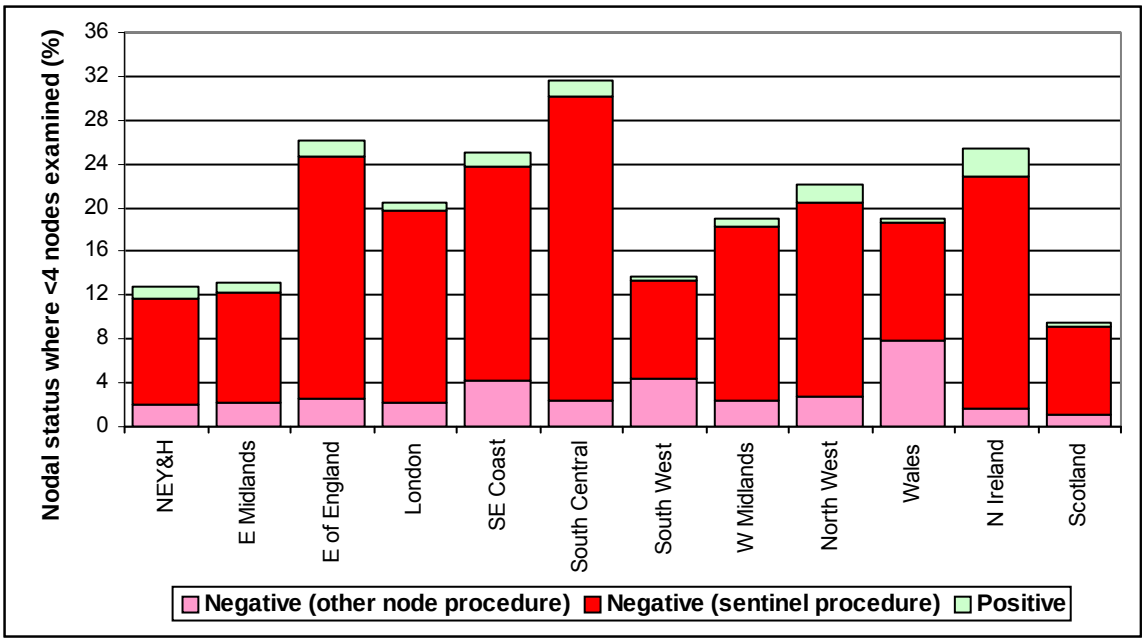

Figure 29 (Table 42): Nodal status for invasive cancers where nodal status was determined on the basis of <4 nodes, expressed as the percentage of invasive cancers with known nodal status

Table 43 shows that the proportion of cases with positive nodal status is lower (20%) for cases which underwent a sentinel lymph node procedure compared with cases which did not have a sentinel lymph node procedure (26%). This is consistent with the selection of patients who were thought to be of high risk (e.g. high grade, palpable nodes) or who have positive nodes on non-operative ultrasound guided cytology or core biopsy, for axillary sampling or clearance. Of the 887 cases which had their positive nodal status determined from a sentinel lymph node procedure, only 331 (37%) had a subsequent axillary procedure (Table 44). For 463 cases (52%), four or more nodes were taken in the only axillary operation, indicating that other nodes were taken as well as the sentinel node at this time. This probably reflects the relatively large number of surgeons who were doing the audit phase

of the New Start Programme in 2006/07. These surgeons may be carrying out a sentinel lymph node biopsy and their routine axillary surgery in the same operation.

For 93 cases (10%), the positive nodal status was determined on the basis of fewer than 4 nodes as no subsequent axillary procedures were recorded. A further 30 invasive cancers (0.3%) had their positive nodal status determined on the basis of fewer than 4 nodes without a sentinel node procedure. Regional QA reference centres and regional QA surgeons should follow up all of the cases where the positive nodal status was determined on the basis of fewer than four nodes to ensure that the appropriate nodal procedures have been undertaken and that the axilla has not been under-treated.

INVASIVE CANCERS WITH INSUFFICIENT NODAL INFORMATION

	Total invasive cancers with surgery	***Unknown nodal status*** *(Table 38)*	***Negative <4 nodes*** *(Not sentinel procedure - Table 42)*	***Insufficient nodal information***	
Region	***No.***	***No.***	***No.***	***No.***	***%***
N East, Yorks & Humber	*1,478*	*38*	*30*	*68*	*5*
East Midlands	*936*	*10*	*21*	*31*	*3*
East of England	*1,213*	*47*	*29*	*76*	*6*
London	*1,091*	*51*	*22*	*73*	*7*
South East Coast	*923*	*38*	*37*	*75*	*8*
South Central	*925*	*22*	*21*	*43*	*5*
South West	*1,245*	*33*	*54*	*87*	*7*
West Midlands	*1,100*	*13*	*26*	*39*	*4*
North West	*1,417*	*35*	*38*	*73*	*5*
Wales	*650*	*5*	*51*	*56*	*9*
Northern Ireland	*200*	*11*	*3*	*14*	*7*
Scotland	*1,134*	*16*	*12*	*28*	*2*
UK	***12,312***	***319***	***344***	***663***	***5***

The table above shows that of the 12,312 surgically treated invasive cancers, 319 (3%) had unknown nodal status and that 344 (3%) had their negative nodal status determined on the basis of 1, 2 or 3 nodes with no known sentinel lymph node procedure. Thus, 663 (5%) of the 12,312 invasive cancers detected appear to have insufficient nodal information to provide a satisfactory diagnostic work-up. This proportion varied from 2% in Scotland to 9% in Wales. Regional QA reference centres and regional QA surgeons should audit all of these cases to ascertain whether the data are a true reflection of clinical practice, as these cancers may have had an insufficient diagnostic work-up.

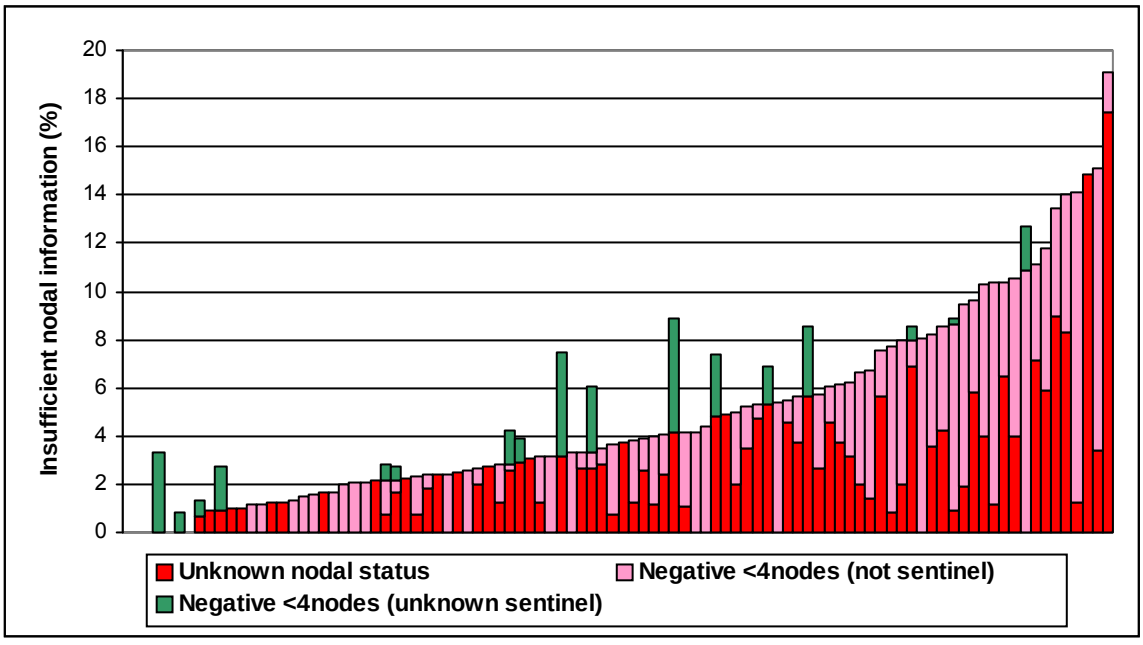

Figure 30: Proportion of invasive cancers with insufficient nodal information in each screening unit

Figure 30 shows how the proportion of invasive cancers with unknown nodal status and with negative nodal status determined on the basis of less than 4 nodes without a sentinel lymph node procedure varied in individual screening units. The proportion of invasive cancers with insufficient nodal information to provide a satisfactory diagnostic work-up varied between 0% and 19%.

COMMENTS:

- In the UK as a whole, 97% of surgically treated invasive cancers had known nodal status. This varied between 95% in London and Northern Ireland to 99% in East Midlands, West Midlands, Wales and Scotland.
- In 25 screening units, nodal status was ascertained for 100% of surgically treated invasive cancers. Regional QA reference centres with screening units with more than 5% of cases with unknown nodal status should audit these cases to determine the reasons for the absence of these important data.
- In the UK as a whole, 40% of surgeons performed a full sentinel lymph node procedure using isotope and blue dye. This varied from 0% in Northern Ireland to 55% in South West.
- A further 40 surgeons (11%) carried out blue dye guided 4 node sampling. This was the predominant axillary technique used by surgeons in Wales (33%).
- For the 11,998 invasive cancers with axillary surgery, 38% had a sentinel lymph node procedure. The number of women with less than four nodes taken without a sentinel lymph node procedure has dropped from 4.6% in 2005/06 to 3.1% in 2006/07.
- In the UK as a whole, the proportion of cases with positive nodal status (24%) was similar to that in previous years. A wide variation in nodal status was apparent in individual screening units with the proportion of positive nodes ranging from 10% (52 cancers) to 38% (103 cancers).
- 10% of the 887 cancers which had their positive nodal status determined from a sentinel lymph node procedure where less than 4 nodes were taken, appeared to have had no subsequent axillary procedure. A further 30 invasive cancers had their positive nodal status determined on the basis of fewer than 4 nodes without a sentinel node procedure. Regional QA reference centres and regional QA surgeons should follow up all of these cases to ensure that the appropriate nodal procedures have been undertaken and that the axilla has not been under-treated.

5.2 Lymph Node Status of Non-invasive Cancers

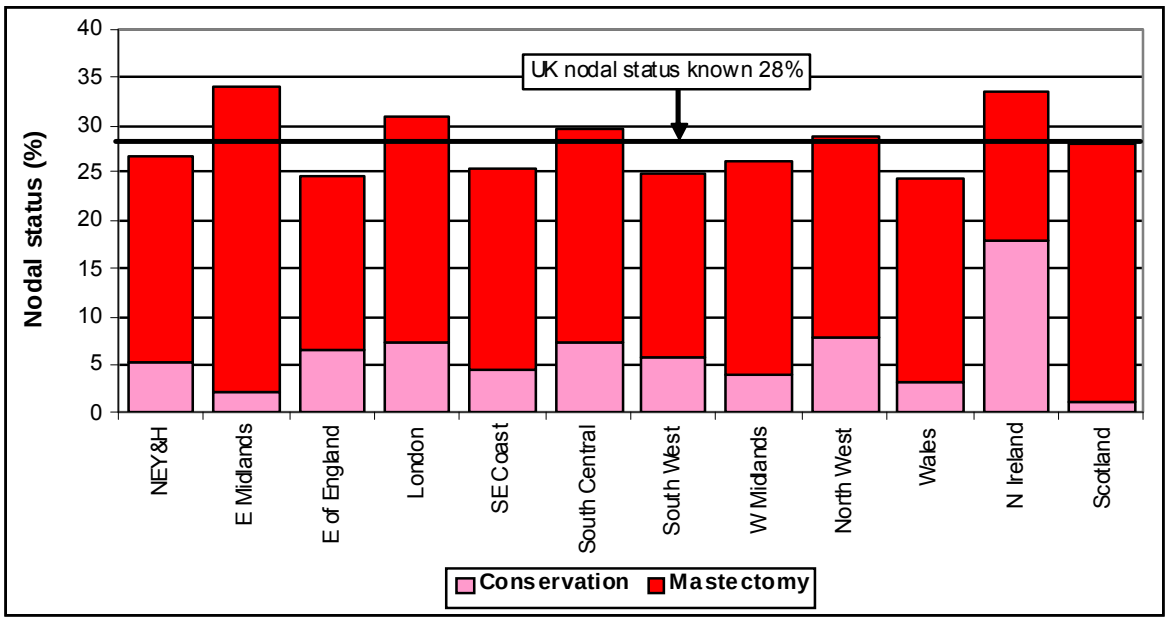

Figure 31: The proportion of non-invasive cancers treated with conservation surgery and mastectomy with known nodal status

Of the 3,155 surgically treated non-invasive cancers, 28% had known nodal status, varying from 25% in East of England, South West and Wales to 34% in East Midlands (Table 45). For one case in

London it was unknown whether or not nodes were taken. Of the 869 non-invasive cancers with known nodal status, 8 (1%) had positive nodal status recorded (Table 46). This is consistent with previous studies suggesting that 2% of non-invasive breast cancers have non-identified invasive disease removed during the diagnostic process.

Although nodal assessment is not usually indicated for non-invasive cancers, nodes may be obtained when a mastectomy is performed, especially if the assessment process provides suspicion of invasive disease. 81% of the cases with known nodal status were treated by mastectomy (Table 47). This varied from 46% in Northern Ireland to 94% in East Midlands and 96% in Scotland. In the UK as a whole the median number of nodes taken for non-invasive cancers undergoing conservative surgery and mastectomy were 3.5 and 4 respectively (Table 48). The maximum numbers of nodes taken for cases treated with conservative surgery and mastectomy were 15 and 33 respectively. The maximum number of nodes taken for mastectomy cases varied from 10 in Northern Ireland to 29 in North West and 33 in London. It is anticipated that, as the use of sentinel lymph node biopsy increases, the proportion of non-invasive cancers treated with conservation surgery with known nodal status may increase.

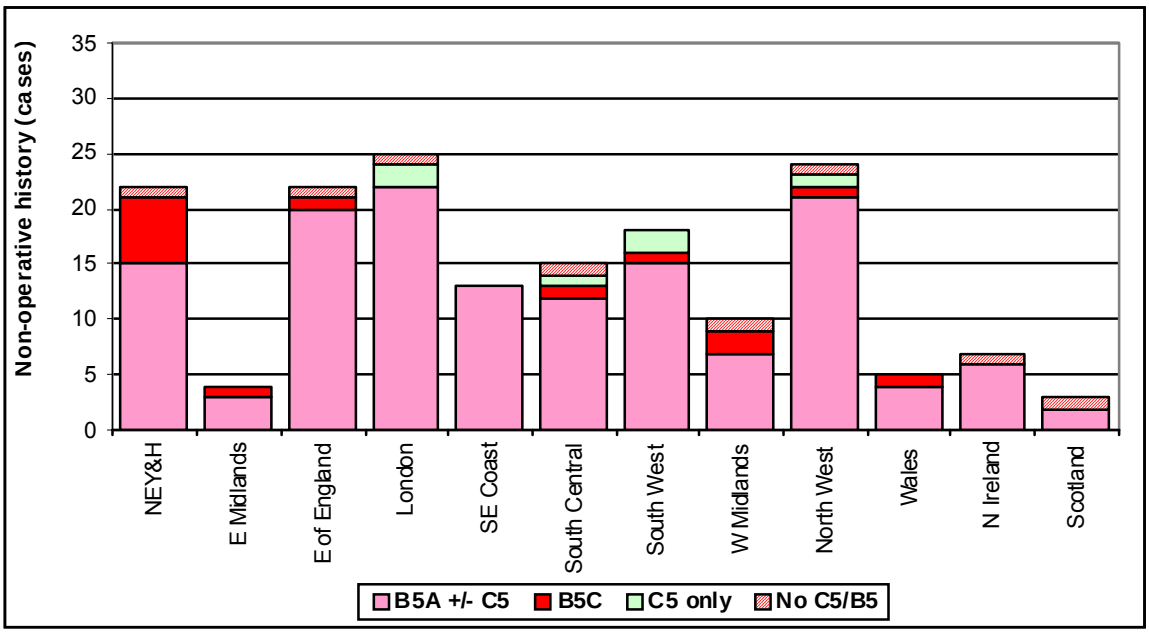

Figure 32 (Table 49): Non-operative history for non-invasive cancers with known nodal status treated by conservation surgery

Figure 32 shows the non-operative history for conservatively treated non-invasive cancers with known nodal status. In the UK as a whole, for 140 cancers (83%) non-invasive disease was predicted by the core biopsy result (B5a (Non-invasive)). Radiological or clinical factors may thus have influenced the decision to take nodes for these cases. Interestingly, 90% of the non-invasive cancers treated with mastectomy with known nodal status also had a B5a (Non-invasive) non-operative diagnosis. 6 cases (4%) had C5 cytology alone with no B5 core biopsy before proceeding to breast conservation with axillary surgery. For a further 14 cases, the core biopsy result was either that the tumour was not assessable or of unknown malignancy type and 8 cases had neither a C5 cytology nor a B5 core biopsy result prior to surgery.

COMMENTS:

- Although nodal assessment is not usually indicated for non-invasive cancers, 28% of non-invasive cancers had known nodal status. This varied from 25% in East of England, South West and Wales to 34% in East Midlands.
- For non-invasive cancers with known nodal status, 83% of those undergoing conservation surgery and 90% of those undergoing mastectomy had non-invasive disease predicted by a B5a (Non-invasive) core biopsy result. Radiological or clinical factors may thus have influenced the decision to take nodes for these cases.

COMMENTS:

- 81% of the cases with known nodal status were treated by mastectomy. This varied from 46% in Northern Ireland to 94% in East Midlands and 96% in Scotland.
- The median number of nodes taken for non-invasive cancers undergoing conservative surgery and mastectomy were 3.5 and 4 respectively. The maximum numbers of nodes taken for cases treated with conservative surgery and mastectomy were 15 and 33 respectively. The maximum number of nodes taken for mastectomy cases varied from 10 in Northern Ireland to 29 in North West and 33 in London.

5.3 Grade of Invasive Cancers

Of the 12,312 invasive cancers which had surgery, 3,320 (27%) were Grade I, 6,226 (51%) were Grade II and 2,566 (21%) were Grade III (Table 50). Grade was not assessable for 83 cases (1%) and grade was unknown for 117 cases (1%).

The control charts in Figure 33 show the variation in the proportions of Grade I, II and III cancers recorded for individual screening units. The cases were plotted with the assumption that the proportions were normally distributed. The screening units are positioned with the same x-value in the 3 graphs, according to the total number of invasive cancers which had surgery, so that the units with the highest number of invasive cancers are located at the right hand side of the graphs. The three points (Grade I, II and III) for a single unit can thus be compared vertically. Any points that are outside the 2 dashed lines (95% upper and lower control limits) are considered as significantly higher or lower than the average represented by the solid line. The control charts suggest that there are local variations in the interpretation of invasive grade definitions which should be investigated by regional QA reference centres and their regional QA pathologists. For example, three of the four units in Northern Ireland are among the high outliers in the Grade III control chart and four of the eleven units in North East, Yorkshire & Humber are high outliers in the Grade I control chart.

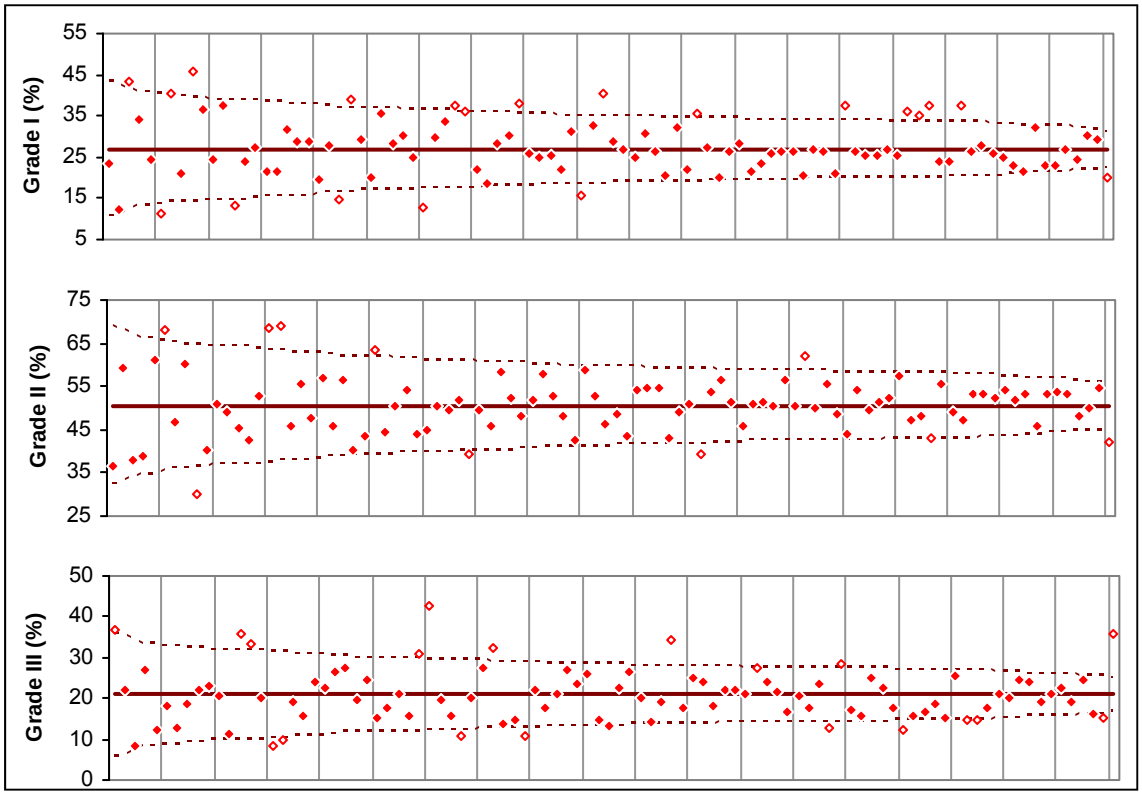

Figure 33: Variation in the grade of surgically treated invasive cancers in each screening unit (open diamond shapes represent units which lie outside the control limits)

5.4 NPI of Invasive Cancers

NPI Group = 0.2 x Invasive Size (cm) + Grade + Nodes
where Nodes equals 1 (0 positive nodes), 2 (1, 2 or 3 positive nodes) or 3 (³4 positive nodes)

EPG	(Excellent Prognostic Group)	≤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

The Nottingham Prognostic Index (NPI) score was calculated for invasive cancers in order to allocate them to one of five prognostic groups. An NPI score was calculated for all invasive cancers with complete size, grade and nodal status information, even if nodal status was based on fewer than 4 nodes. It should be noted that the differences in invasive grade outlined in the previous figure will have affected the NPI groupings.

An NPI score cannot be calculated if size, nodal status or grade is unknown or if grade is not assessable. Overall, an NPI score could not be calculated for 4% (518 cases) of the 12,312 invasive cancers which had surgery. Figure 34 shows that the proportion of cancer with unknown NPI is the lowest in West Midlands (2%) and highest in Northern Ireland (8%). The high proportion of cancers with an unknown NPI score in Northern Ireland was largely due to unknown nodal status.

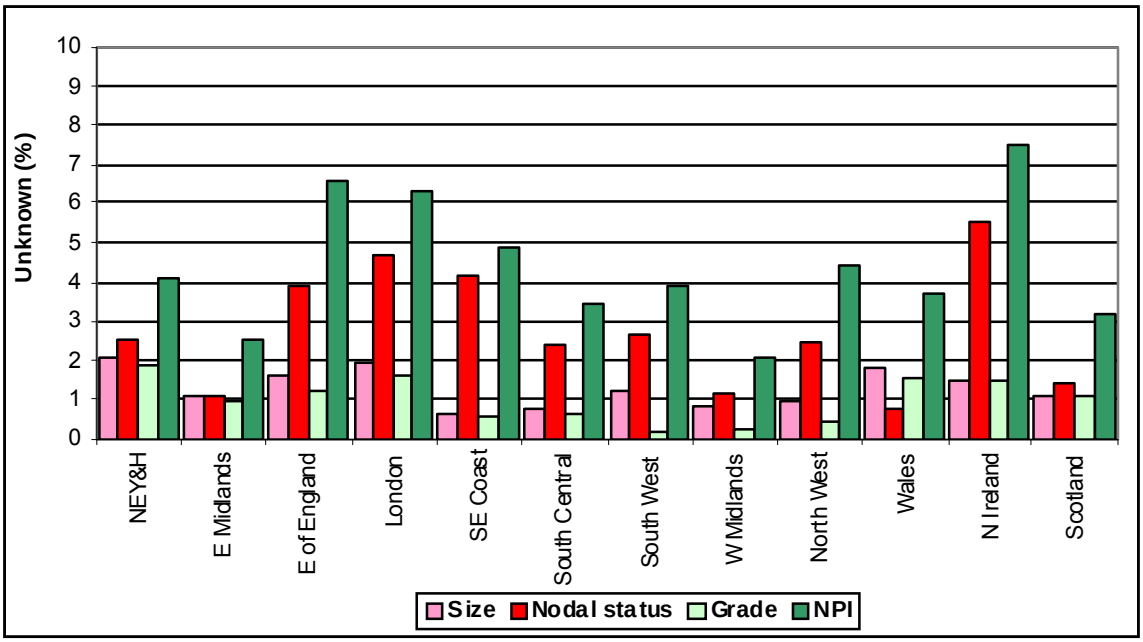

Figure 34 (Table 51): Data completeness of tumour characteristics of surgically treated invasive cancers

Of the 11,794 surgically treated invasive cancers with known NPI score, the highest proportion fell into the Good Prognostic Group (36%), with only 7% (778 cases) in the Poor Prognostic Group (Table 52). As expected with cancers detected by screening, the majority (58%) of cancers fell into the two best prognostic groups, EPG (Excellent Prognostic Group) and GPG (Good Prognostic Group). This varied from 49% in Northern Ireland to 64% in Wales.

In Figure 35, the proportion of invasive cancers for individual screening units in each NPI prognostic group is plotted in the control charts. As in Figure 33, data for the same unit can be compared vertically across the 4 graphs. Any points that are outside the 2 dashed lines (95% C.I. upper and lower control limits) are considered as significantly higher or lower than the average, represented by the solid line.

The first control chart in Figure 35 shows that 17 units have a significantly higher or lower proportion of EPG and GPG cancers than the UK as a whole. The third control chart shows that 8 units have a significantly higher or lower proportion of PPG cancers. 8 units have a significantly higher proportion than the average with unknown NPI score (fourth control chart). Regional QA reference centres and their QA pathologists and surgeons should investigate the reason for these unusual variations.

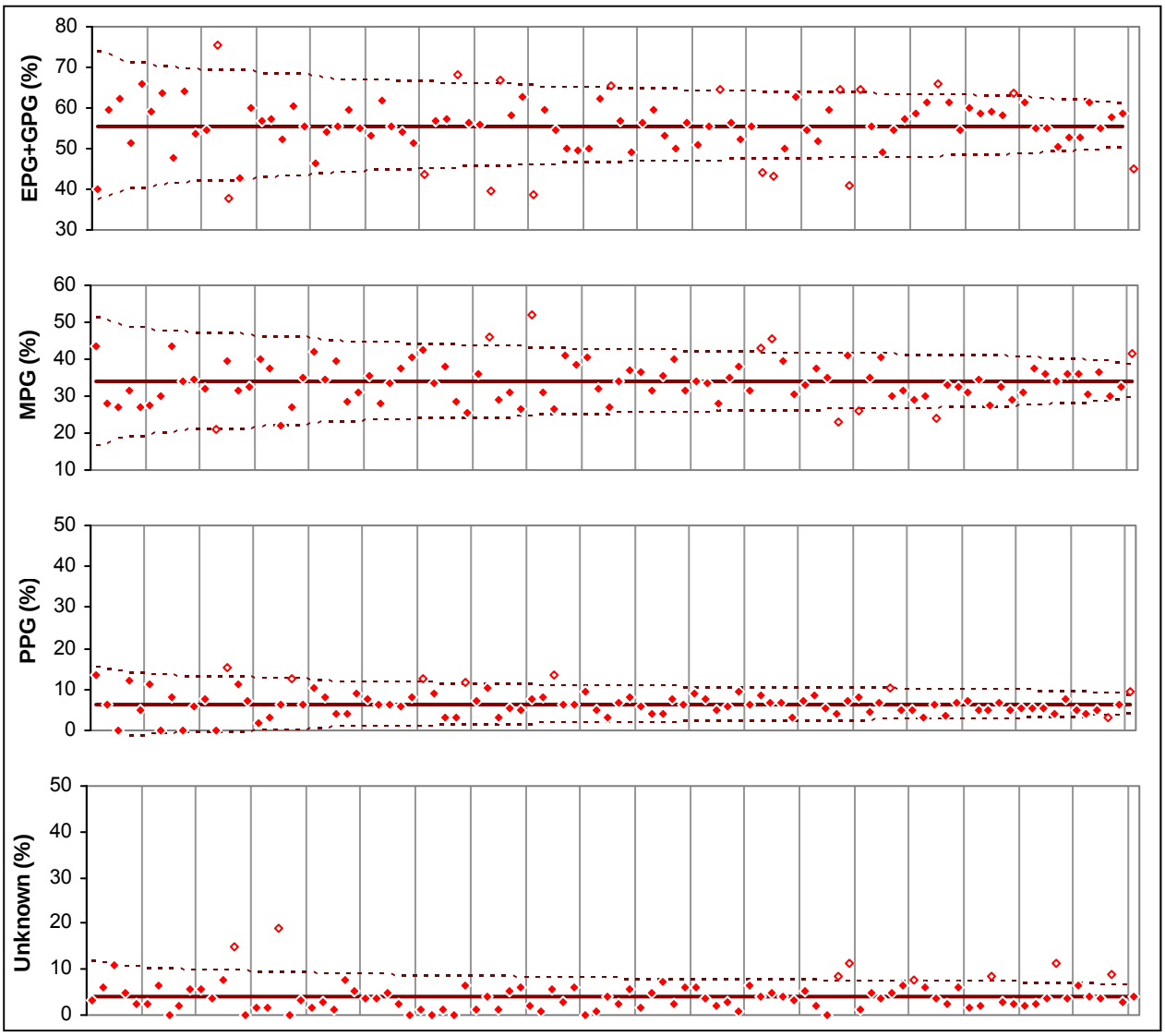

Figure 35: NPI Groups for surgically treated invasive cancers in each screening unit (open diamond shapes represent units which lie outside the control limits)

COMMENTS:

- Overall, 27% of invasive cancers were Grade I, 51% were Grade II and 21% were Grade III. Grade was not assessable for 83 cases (1%) and unknown for 117 cases (1%).
- Control charts suggest that there are local variations in the interpretation of invasive grade definitions which should be investigated by regional QA reference centres and regional QA pathologists.
- Data were available to calculate a Nottingham Prognostic Index (NPI) score for 96% of surgically treated invasive cancers.
- Regional QA reference centres and their regional QA pathologists and regional QA surgeons should investigate the reasons for the significant variations in the proportion of cancers apparent for some screening units in the NPI control charts.

CHAPTER 6
SCREENING SURGICAL CASELOAD

There were 559 consultant breast surgeons working in the UK NHSBSP in 2006/07. This UK figure counts only once the 63 surgeons who worked in more than one region. Throughout this section, each surgeon is credited with their total UK screening caseload. 496 of the 559 consultant surgeons were identified by their unique GMC registration code. A code other than the GMC code was provided for a further 51 surgeons from Scotland. Data for the remaining 12 unknown surgeons have been assumed to be for 12 individual surgeons.

7 YEAR SUMMARY : SCREENING SURGICAL CASELOAD

Year of data collection	*Number of screening surgeons*	*Median screening caseload*	*Proportion of women treated by a surgeon with screening caseload 20+*	*Number of surgeons with screening caseload <10*	*Number of surgeons with no information to explain screening caseload <10*
2000/01	*419*	*17*	*86*	*159*	*25*
2001/02	*439*	*18*	*85*	*156*	*52*
2002/03	*472*	*18*	*86*	*174*	*55*
2003/04	*481*	*19*	*89*	*161*	*15*
*2004/05**	*484*	*20*	*91*	*151*	*10*
2005/06	*511*	*23*	*93*	*149*	*11*
2006/07	*559*	*22*	*91*	*186*	*16*

*Data for 2 units from East of England are absent in 2004/05.

The summary table shows that the proportion of women treated by surgeons with a screening caseload of 20 or more has increased from 86% in 2000/01 to level off at 91% to 93% between 2004/05 and 2006/07.

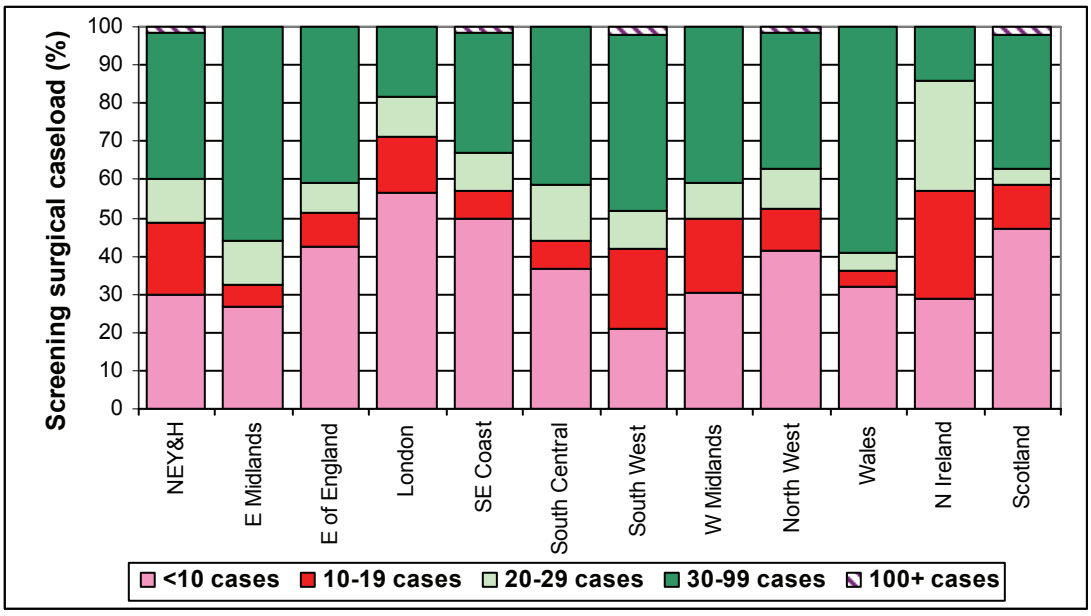

Figure 36 (Table 53): Variation in screening surgical caseload expressed as number of cases per surgeon

The screening surgical caseload is shown for each region in Figure 36. The 63 surgeons working in more than one region appear in each region's figures. 230 surgeons (41%) treated 30-99 cases and

6 surgeons (1%) treated more than 100 cases. 63 surgeons (11%) treated 20-29 screening cases and 74 (13%) treated 10-19 screening cases. 186 surgeons (33%) had a screening caseload of fewer than 10 cases. The highest proportions of surgeons with a screening caseload of fewer than 10 were London (57%) and South East Coast (50%). Surgical specialisation was most advanced in South West where only 21% of surgeons (10 in total) treated fewer than 10 screening cases. Table 65 shows that the highest median surgical caseload was in Wales (48.5 cases) and the lowest in London (7 cases). The highest caseload for a single surgeon was in Scotland, where one surgeon was clinically responsible for 204 cases. Four other surgeons had a screening caseload of more than 100 cases in 2006/07.

Table 55 shows the number of women treated by 1, 2, 3 or more surgeons and those with no referral to a consultant surgeon. Of the 15,856 screen detected cases included in the audit, the majority (99%) were treated by 1 consultant surgeon, 164 (1%) were treated by 2 surgeons and 37 had no consultant surgeon recorded. Three women were treated by 3 consultant surgeons.

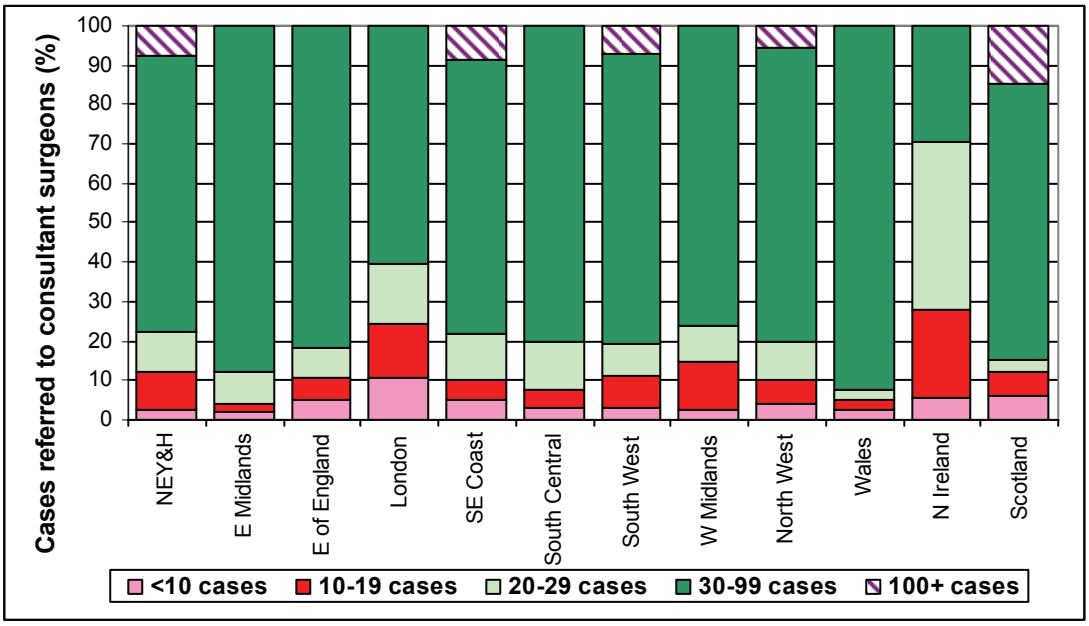

Figure 37 (Table 56): Variation in the proportion of women treated by surgeons with differing screening caseloads

Figure 37 shows that of the 15,819 women who were under the care of a consultant surgeon, 12,035 (75%) were treated by a surgeon with a screening caseload of 30-99 cases. A further 779 women (5%) were treated by 6 surgeons with a screening caseload of 100 cases or more. For 1,533 women (10%) the treating surgeon had a screening caseload of 20-29 cases, and for 1,070 women (7%) the treating surgeon had a screening caseload of 10-19 cases. In the UK as a whole, 572 women (4%) were treated by a surgeon with a screening caseload of less than 10 cases. 155 (27%) of these women were in London.

Each region was asked to provide reasons to explain why surgeons had a screening caseload of less than 10 cases. A list of 7 satisfactory reasons for low screening caseload was provided (see Appendix B). If multiple reasons were given, only one was included. The reasons to explain why surgeons had a UK screening caseload of fewer than 10 cases are shown in Figure 38.

Of the 186 surgeons in the UK with a screening caseload of less than 10 cases, 86 (46%) treated more than 30 symptomatic breast cancers during 2006/07. 29 (16%) either joined or left the NHSBSP during 2006/07. One of the other satisfactory reasons (plastic surgeon, private practice, not screening in area in 2006/07) was given for 50 surgeons (27%). For 5 surgeons a reason other than one of the 7 listed was provided. They treated a total of 8 women and the reasons provided were: locum surgeon, registrar, surgeon from outside the UK and covering for annual leave. No information was available to explain the low screening caseload recorded for 16 surgeons who treated a total of 25 women. 9 of these surgeons were in London. Regional QA reference centres and QA surgeons should investigate why screening cases were treated by these low caseload surgeons.

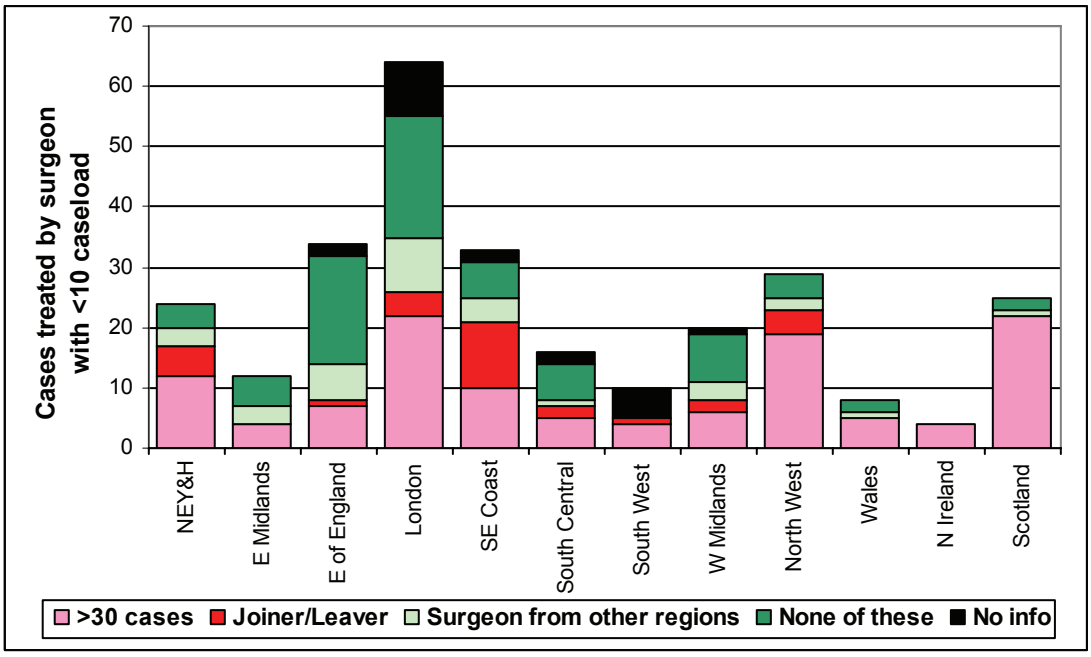

Figure 38 (Table 57): Explanations provided for surgeons treating less than 10 screening cases a year

COMMENTS:

- There were 559 consultant breast surgeons working in the UK NHSBSP in 2006/07.
- 91% of women were treated by a surgeon with a screening caseload of at least 20 cases.
- Of the 186 surgeons with screening caseload of less than 10 cases, 46% treated more than 30 symptomatic breast cancers during 2006/07.
- Information was unavailable to explain the low caseload of 16 surgeons treating a total of 25 women. 8 of these surgeons were in London. Regional QA reference centres and QA surgeons should investigate why screening cases were treated by these low caseload surgeons.

CHAPTER 7
NUMBER AND SEQUENCE OF THERAPEUTIC OPERATIONS

Details of each operation were requested so that the reasons for repeat therapeutic operations could be examined. All operations, both diagnostic and therapeutic, were coded as either conservation surgery alone (Cons), mastectomy alone (Mx), axillary surgery alone (Ax) or a combination (Cons & Ax, Mx & Ax). Diagnostic open biopsies were coded as conservation surgery. For any case without a non-operative diagnosis by C5 cytology or B5 core biopsy, the first operation was defined to be diagnostic even if there was also therapeutic intent, so that the number of therapeutic operations is one fewer than the total number of operations. It should also be noted that attempting axillary surgery does not necessarily mean that axillary lymph nodes are successfully harvested. Conversely, incidental axillary lymph nodes can be obtained during a mastectomy or conservation surgery procedure.

Repeat operation rates for various groups of screen-detected breast cancer with differing non-operative diagnoses are presented in flow charts which show the number and proportion of the different types and sequences of therapeutic operation undertaken in the UK as a whole. Regional variations in the most popular sequences are summarised in Tables 63, 65, 67 and 69 in Appendix E.

7.1 Repeat Therapeutic Operations

Quality Objective	**To minimise the number of therapeutic operations**
Outcome Measure	**90% of women with single lesions (excluding multi-focal tumours and those with associated extensive ductal carcinoma *in situ*) should not require a further operation to ensure complete excision**

(Quality Assurance Guidelines for Surgeons in Breast Screening, NHSBSP Publication No 20, revised November 2003)

It is not possible to identify from the information recorded in the audit which cases were multi-focal or considered to have extensive DCIS. As a result data are presented for all cases that underwent more than one operation.

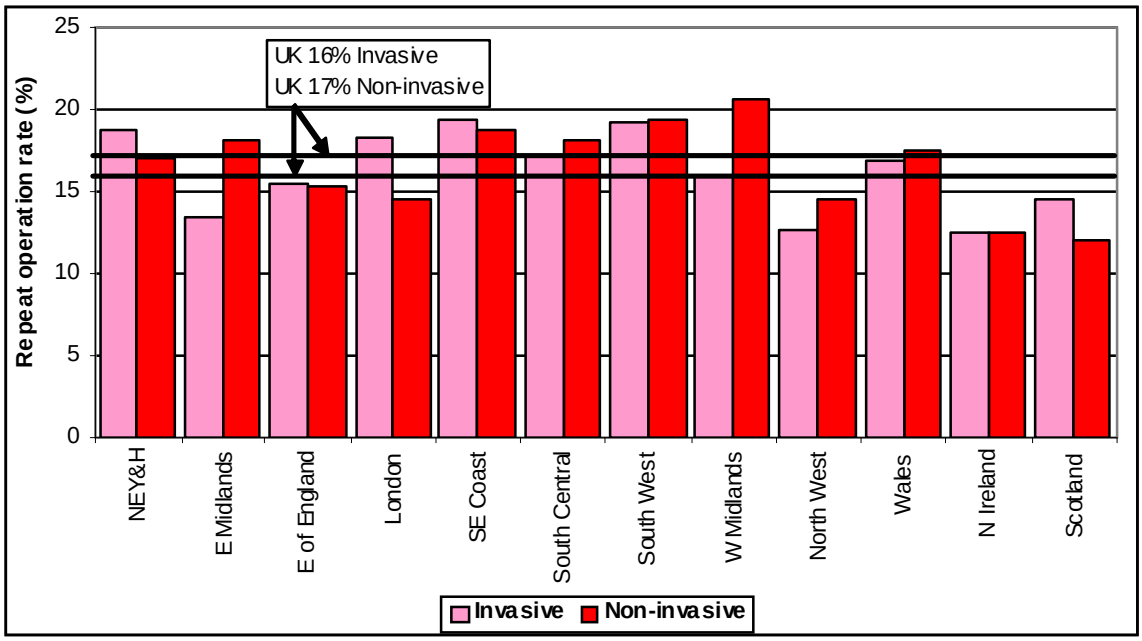

Figure 39 (Tables 60 & 61): Variation in the proportion of invasive and non-invasive cancers undergoing two or more therapeutic operations

In the UK as a whole, 2,573 cancers (17%) with a proven non-operative diagnosis by C5 cytology and/or B5 core biopsy underwent more than one therapeutic operation (Table 58). This varied from 13% in Northern Ireland to 21% in South East Coast. 2,046 invasive cancers (16%) and 533 non-invasive cancers (17%) underwent more than one therapeutic operation (Figure 39). For invasive cancers the proportion having more than one operation varied from 12% in Northern Ireland (25 cancers) to 19% in North East, Yorkshire & Humber, South East Coast and South West. For non-invasive cancers the proportion having more than one operation varied from 12% in Scotland (30 cancers) to 21% in West Midlands (56 cancers).

For the 888 cancer without a non-operative diagnosis, 51% have only a diagnostic operation (Table 59). 44% had a second operation, which is also their first therapeutic operation. For 46 cases, 2 therapeutic operations were performed.

Repeat therapeutic operations may be carried out for a variety of reasons including re-excision to clear margins involving either an invasive tumour or associated DCIS, an axillary procedure to obtain lymph nodes when these were not taken in the first operation or when a sentinel lymph node is found to be positive, and re-excision to improve cosmesis. The reasons for repeat therapeutic operations for cancers with a non-operative diagnosis vary with the invasive status predicted by the non-operative diagnosis. The following hypothetical scenarios could all result in a requirement for a repeat operation.

Scenario 1 : Invasion present which was not predicted by the non-operative diagnosis and a repeat operation is undertaken to obtain axillary lymph nodes

- cancers with a B5a (Non-invasive) non-operative diagnosis found to be invasive after surgery where nodes were not taken at first operation
- cancers with a C5 diagnosis where the invasive status could not be predicted and where nodes were not taken at the first operation in line with local protocol

Scenario 2 : Margins not clear for the expected tumour component (invasive or non-invasive)

- repeat operation (conservation or mastectomy) to clear involved margin(s)

Scenario 3 : Margins not clear because of an unexpected tumour component (invasive or non-invasive) and a repeat operation (conservation or mastectomy) undertaken to clear involved margin(s)

- multi-focal invasive or non-invasive cancer present
- small cancers with a B5b (Invasive) non-operative diagnosis found after surgery to have DCIS present which reaches the excision margin(s)

Scenario 4 : Additional therapeutic nodal procedure(s)

- insufficient number of nodes harvested at first operation
- therapeutic clearance of nodes when a large number of the nodes taken at the first operation are positive
- clearance of nodes following a positive sentinel lymph node biopsy procedure

7.2 Type and Sequence of Therapeutic Operations

The types and sequences of therapeutic operations undertaken in the UK as a whole are shown in Figure 40 for cancers with a B5b (Invasive) core biopsy, in Figure 41 for cancers with C5 Cytology only, in Figure 42 for non-invasive or micro-invasive cancers with a B5a (Non-invasive) core biopsy and in Figure 43 for cancers with a B5a (Non-invasive) core biopsy which were found to be invasive at surgery. Each flow chart shows the type of surgery performed at the first, second, third or in rare cases fourth operation.

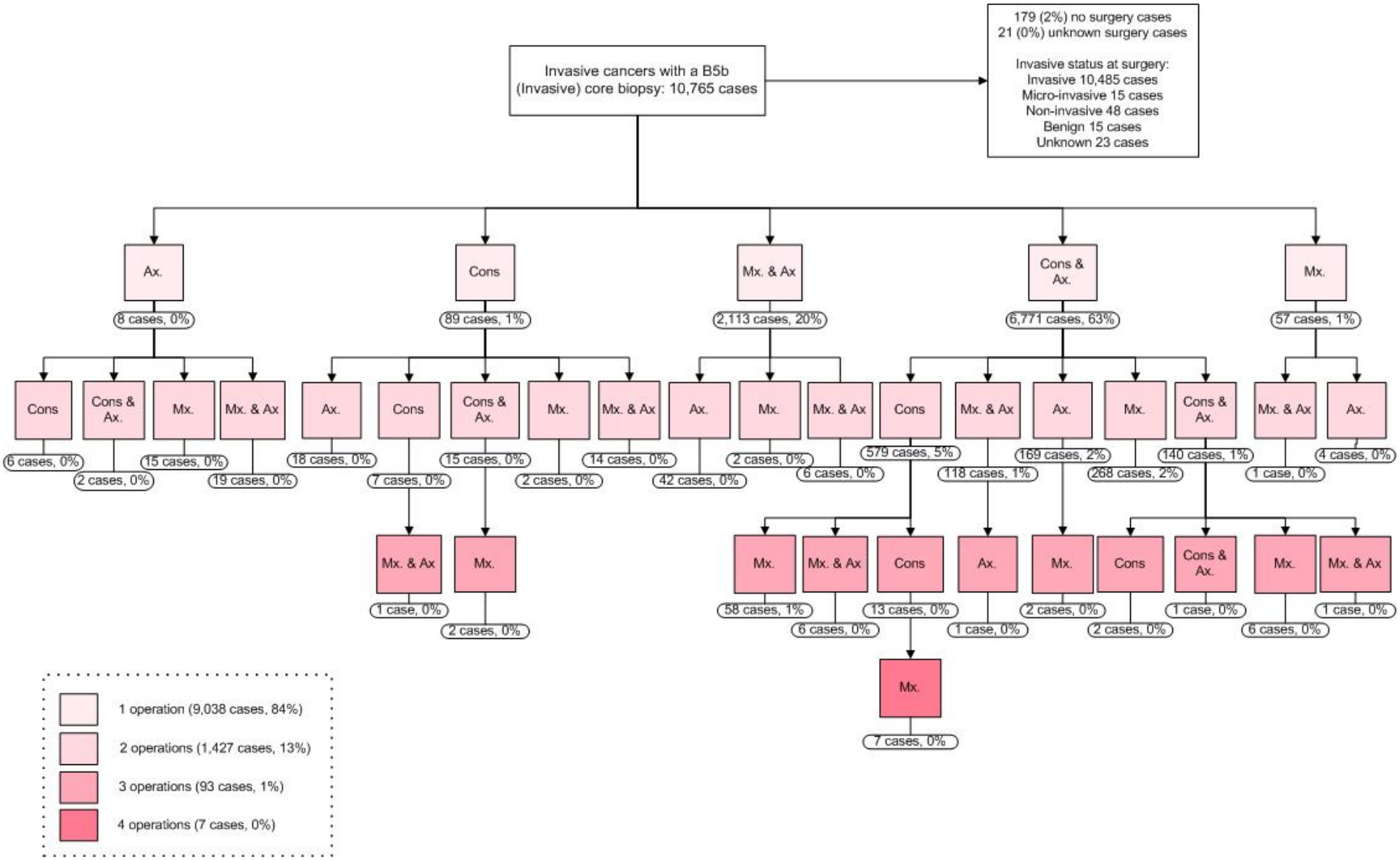

Figure 40: Sequence of operations for Invasive cancers with a B5b (Invasive) core biopsy

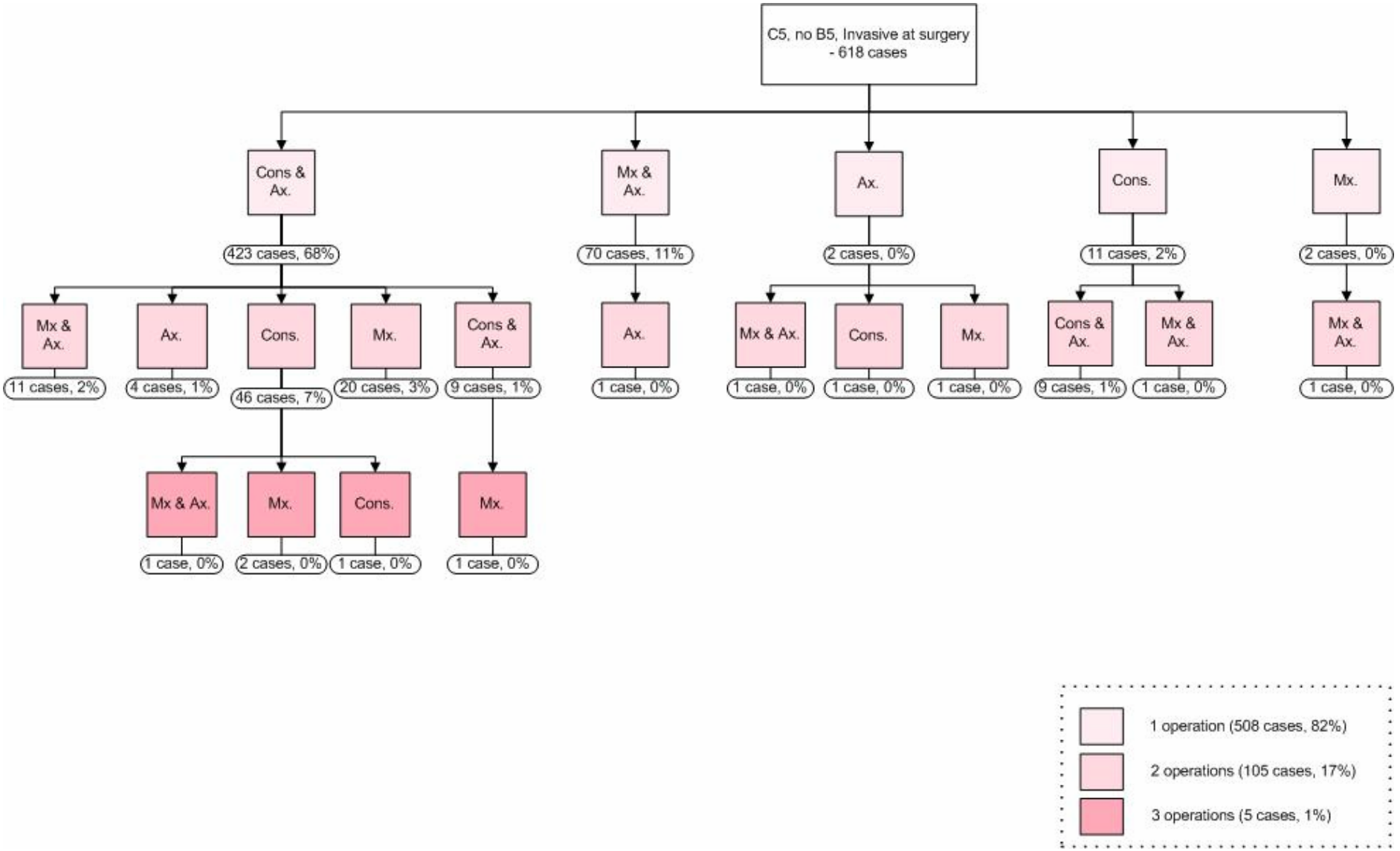

Figure 41: Sequence of operations for invasive cancers with C5 cytology only, no B5 core biopsy

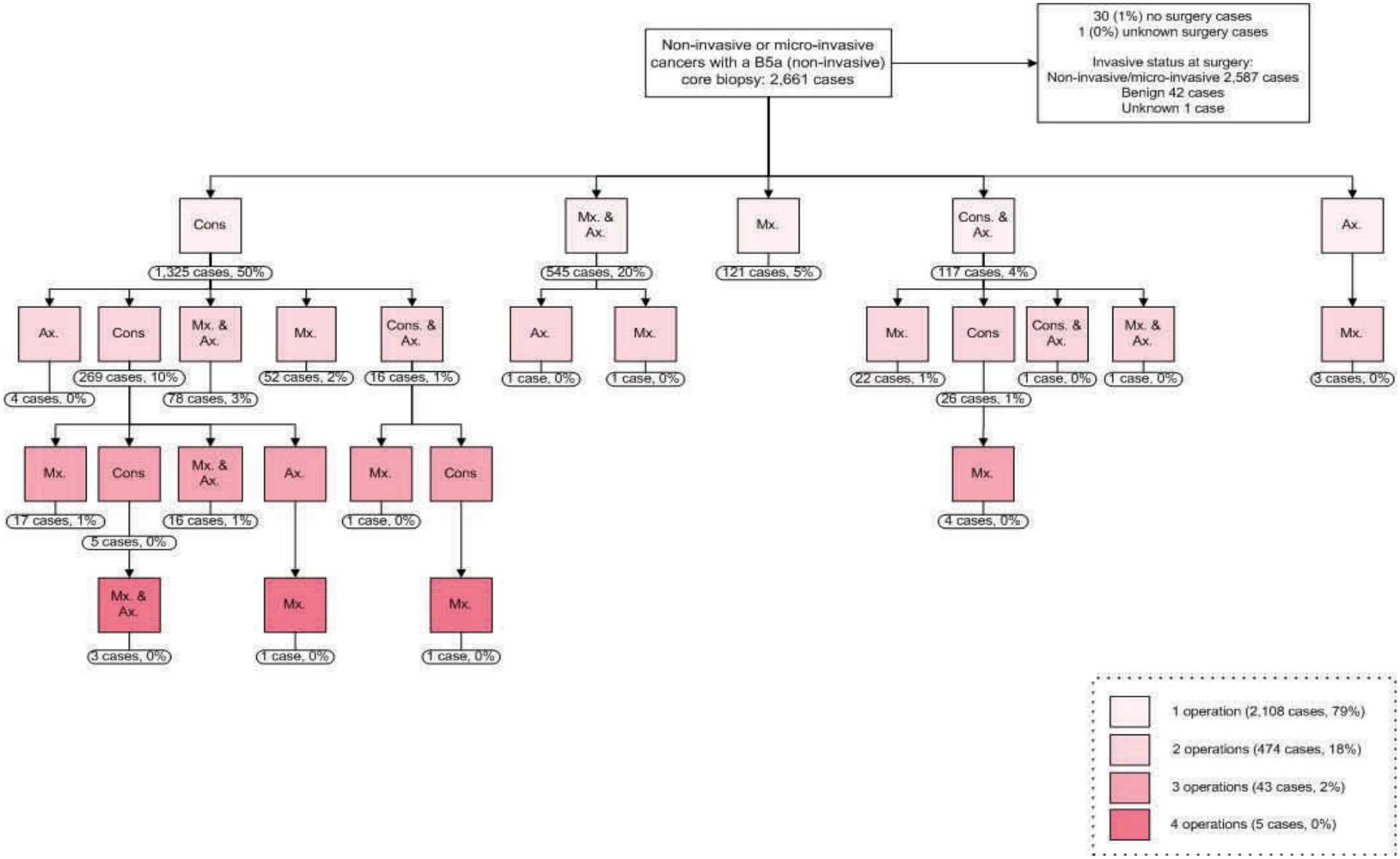

Figure 42: Sequence of operations for non-invasive or micro-invasive cancers with a B5a (non-invasive) core biopsy

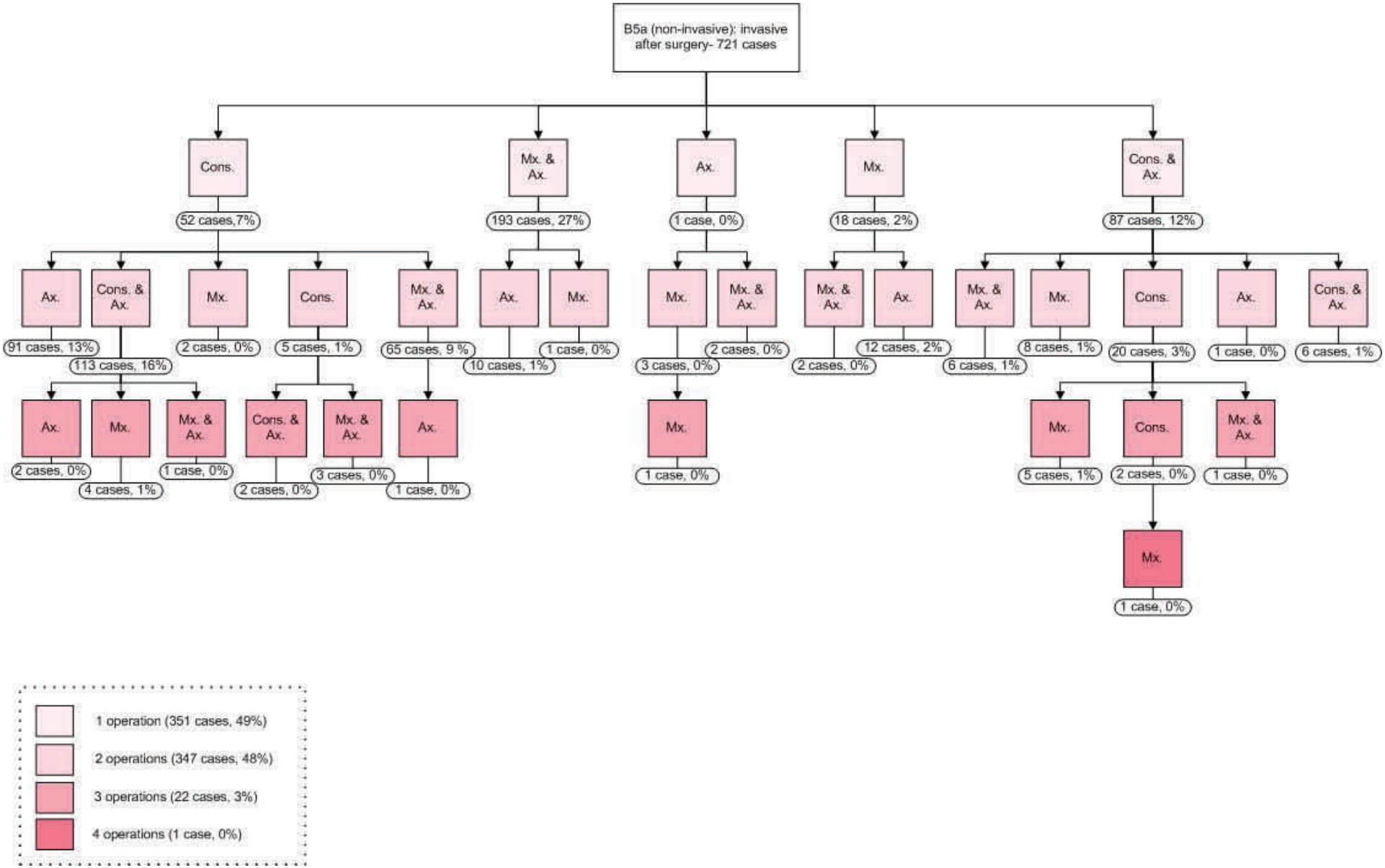

Figure 43: Sequence of operations for cancers with B5a (non-invasive) core biopsy determined to be invasive after surgery

99% of cancers with a B5b (Invasive) core biopsy result proved to be invasive following surgery (Table 9). The therapeutic surgical operation can thus be planned in advance and these cases are least likely to require a repeat operation. 96% of cancers with C5 cytology only and no B5 core biopsy proved to be invasive after surgery (Table 10). For these cancers, where the invasive status cannot be predicted microscopically, radiological or clinical features are of increased importance when planning the therapeutic surgical operation. In the UK as a whole, 77% of cancers with a B5a (Non-invasive) core biopsy result were confirmed following surgery to be non-invasive or micro-invasive and 22% were identified as having invasive disease (Table 8). There was, however, wide variation between individual screening units in the latter; with the proportion of cancers with a B5a (Non-invasive) core biopsy found to be invasive after surgery varying between 0% and 50%.

The following table summarises the regional variation in the proportion of cancers in each diagnostic category that had a mastectomy as their first therapeutic operation. The data in this and all of the other summary tables in this chapter exclude the 101 cancers with a B5b (Invasive) core biopsy for which the invasive status was not confirmed after surgery (see Figure 40) and the 43 cancers with a B5a (Non-invasive) core biopsy that were found to be benign or had unknown invasive status at surgery (see Figure 42).

The table shows that in the UK as a whole, invasive cancers with B5b (Invasive) core biopsy had an initial mastectomy rate of 21%. This varied from 16% in South West to 26% in East Midlands. 74 (12%) of the 539 surgically treated invasive cancers diagnosed by C5 Cytology only had a mastectomy as their first therapeutic operation. 18 (24%) of these cancers were in North East, Yorkshire & Humber and 16 (22%) in North West. QA reference centres and QA surgeons should audit these cases to determine why cancers with unconfirmed invasive status had a mastectomy as an initial operation. Non-invasive or micro-invasive cancers with a B5a (Non-invasive) core biopsy had an initial mastectomy rate of 26%. This varied from 18% in South Central to 36% in East Midlands. Invasive cancers with a B5a (Non-invasive) core biopsy had the highest initial mastectomy rate (33%). This varied from 13% in South Central to 50% in East Midlands.

MASTECTOMY AS FIRST OPERATION

	Invasive cancers						***Non-invasive or micro-invasive cancers***	
	B5b		***C5 only, no B5***		***B5a***		***B5a***	
Region	***No.***	***%***	***No.***	***%***	***No.***	***%***	***No.***	***%***
N East, Yorks & Humber	*277*	*23*	*18*	*16*	*98*	*28*	*40*	*42*
East Midlands	*220*	*26*	*3*	*50*	*64*	*36*	*27*	*50*
East of England	*231*	*22*	*4*	*11*	*65*	*24*	*16*	*25*
London	*193*	*20*	*2*	*7*	*68*	*26*	*17*	*31*
South East Coast	*139*	*19*	*8*	*9*	*57*	*24*	*15*	*24*
South Central	*138*	*17*	*6*	*21*	*27*	*18*	*7*	*13*
South West	*174*	*16*	*0*	*0*	*67*	*25*	*19*	*29*
West Midlands	*172*	*18*	*5*	*10*	*51*	*22*	*22*	*35*
North West	*272*	*24*	*16*	*10*	*59*	*23*	*32*	*38*
Wales	*125*	*22*	*2*	*67*	*34*	*24*	*15*	*29*
Northern Ireland	*24*	*17*	*10*	*29*	*7*	*23*	*3*	*25*
Scotland	*240*	*23*	*0*	*0*	*69*	*34*	*23*	*37*
United Kingdom	***2205***	***21***	***74***	***12***	***666***	***26***	***236***	***33***

Shaded if 5% or more above the value for the UK as a whole and more than one cancer is included

The following table summarises the regional variation in repeat operation rates for cancers with each type of non-operative diagnosis. The table shows that invasive cancers with a B5b (Invasive) core biopsy had the lowest proportion of repeat operations (14%). This varied from 11% in North West to 17% in London, South East Coast and South West. 110 (18%) of the 539 surgically treated invasive cancers diagnosed by C5 Cytology only underwent a repeat operation. 27 (24%) of these cancers were in North West, 22 (20%) in South East Coast, 21 (19%) in North East Yorkshire & Humber and

18 (16%) in South West. Non-invasive or micro-invasive cancers with a B5a (Non-invasive) core biopsy had a repeat operation rate of 20%. This varied from 10% in Northern Ireland to 24% in South East Coast and West Midlands. As expected, invasive cancers with a B5a (Non-invasive) core biopsy had the highest repeat operation rate (51%). This varied from only 25% in Northern Ireland to 63% in South West and West Midlands.

REPEAT THERAPEUTIC OPERATION RATES

	Invasive cancers						***Non-invasive or micro-invasive cancers***	
	B5b *(Table 62)*		***C5 only, no B5*** *(Table 64)*		***B5a*** *(Table 68)*		***B5a*** *(Table 66)*	
Region	***No.***	***%***	***No.***	***%***	***No.***	***%***	***No.***	***%***
N East, Yorks & Humber	*192*	*16*	*21*	*18*	*50*	*52*	*66*	*19*
East Midlands	*102*	*12*	*1*	*17*	*24*	*44*	*35*	*19*
East of England	*153*	*15*	*1*	*3*	*32*	*49*	*53*	*19*
London	*163*	*17*	*4*	*14*	*30*	*55*	*50*	*19*
South East Coast	*122*	*17*	*22*	*24*	*34*	*55*	*55*	*24*
South Central	*123*	*15*	*3*	*11*	*31*	*60*	*31*	*20*
South West	*177*	*17*	*18*	*29*	*41*	*63*	*62*	*23*
West Midlands	*126*	*13*	*9*	*18*	*39*	*63*	*54*	*24*
North West	*122*	*11*	*27*	*17*	*30*	*36*	*52*	*20*
Wales	*88*	*15*	*1*	*33*	*21*	*41*	*29*	*21*
Northern Ireland	*20*	*14*	*2*	*6*	*3*	*25*	*3*	*10*
Scotland	*124*	*12*	*1*	*50*	*35*	*56*	*31*	*15*
United Kingdom	***1512***	***14***	***110***	***18***	***370***	***51***	***521***	***20***

Shaded if 5% or more above the value for the UK as a whole and more than one cancer is included

7.3 Repeat Therapeutic Operations to Clear Margins

The following table summarises the regional variation in the proportion of cancers initially treated with conservation surgery that had repeat therapeutic conservation operations to clear margins.

REPEAT THERAPEUTIC CONSERVATION OPERATIONS TO CLEAR MARGINS

	Invasive cancers						***Non-invasive or micro-invasive cancers***	
	B5b		***C5 only, no B5***		***B5a***		***B5a***	
Region	***No.***	***%***	***No.***	***%***	***No.***	***%***	***No.***	***%***
N East, Yorks & Humber	*92*	*10*	*12*	*13*	*19*	*34*	*33*	*13*
East Midlands	*52*	*8*	*0*	*0*	*11*	*41*	*28*	*24*
East of England	*60*	*7*	*1*	*3*	*9*	*19*	*29*	*14*
London	*87*	*11*	*3*	*12*	*15*	*39*	*29*	*15*
South East Coast	*92*	*15*	*18*	*22*	*24*	*51*	*43*	*24*
South Central	*42*	*6*	*0*	*0*	*12*	*29*	*13*	*10*
South West	*112*	*13*	*12*	*20*	*25*	*54*	*43*	*22*
West Midlands	*64*	*8*	*6*	*14*	*9*	*23*	*28*	*16*
North West	*48*	*6*	*12*	*8*	*11*	*21*	*22*	*11*
Wales	*35*	*8*	*1*	*100*	*7*	*20*	*20*	*19*
Northern Ireland	*7*	*6*	*0*	*0*	*0*	*0*	*3*	*13*
Scotland	*56*	*7*	*0*	*0*	*8*	*20*	*25*	*19*
United Kingdom	***747***	***9***	***65***	***12***	***150***	***31***	***316***	***16***

Shaded if 5% or more above the value for the UK as a whole and more than one cancer is included

In the UK as a whole, 9% of invasive cancers with a B5b (Invasive) non-operative diagnosis, which were initially treated with a conservation operation, had repeat conservation operations to clear

margins. This varied from 6% in South Central, North West and Northern Ireland to 15% in South East Coast. 12% of invasive cancers with a C5 cytology only non-operative diagnosis, which were initially treated with a conservation operation, had repeat operations to clear margins. This varied from 8% in North West to 22% in South East Coast. 16% of non-invasive and micro-invasive cancer with a B5a (Non-invasive) non-operative diagnosis had repeat operations to clear margins. This varied from 11% in North West to 24% in East Midlands and South East Coast. Invasive cancers with a B5a (Non-invasive) non-operative diagnosis, which were initially treated with a conservation operation, had the highest repeat operation rate to clear margins (31%). This varied from 19% in East England to 54% in South West.

Figure 44 shows that in the UK as a whole, 12% of all cancers with a non-operative diagnosis, which were initially treated with conservation surgery, had repeat conservation operations to clear margins. This varied between 6% Northern Ireland and 20% in South East Coast.

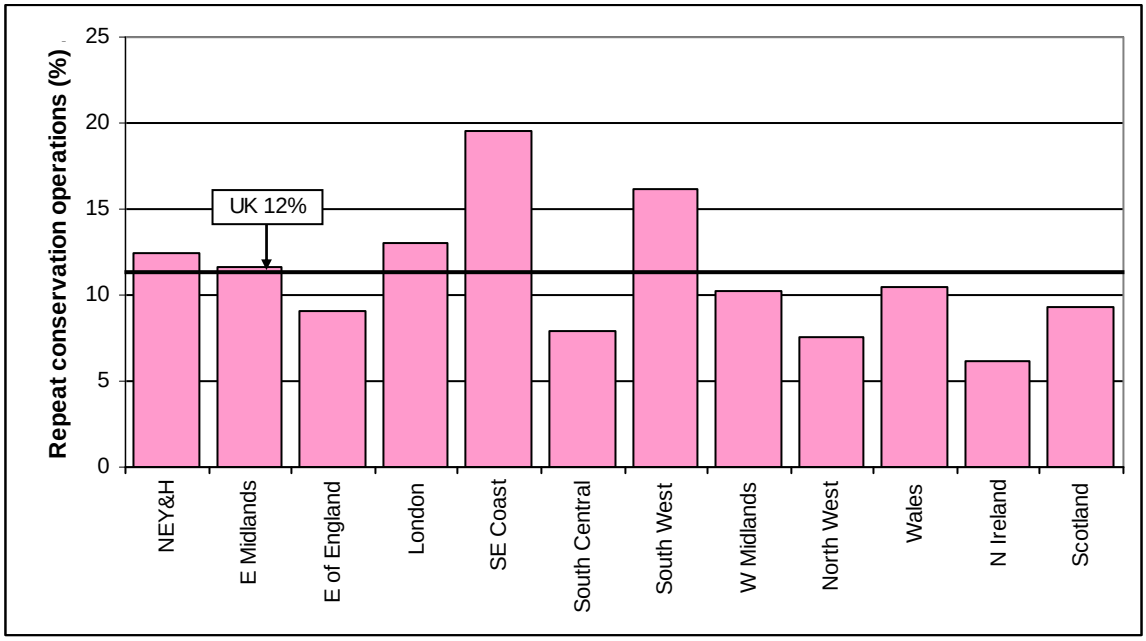

Figure 44: Proportion of cancers which were initially treated with conservation surgery and had repeat conservation operation(s) to clear margins

The following table summarises the regional variation in the proportion of cancers initially treated with conservation surgery that eventually went on to have a mastectomy. In the UK as a whole 6% of invasive cancers with a B5b (invasive) non-operative diagnosis, initially treated with conservation surgery, went on to have a mastectomy. 36 (7%) of the 539 surgically treated invasive cancers diagnosed by C5 Cytology only, which were initially treated with conservation surgery, went on to have a mastectomy. 13 (36%) of these cancers were in North West. 10% of non-invasive cancers with a B5a (Non-invasive) non-operative diagnosis, initially treated with conservation surgery, went on to have a mastectomy. This varied from 3% in Scotland to 15% in West Midlands. Invasive cancers with a B5a (Non-invasive) core biopsy had the highest repeat conversion of conservation surgery to mastectomy (20%). This varied from 11% in London and Wales to 30% in West Midlands and 33% in Northern Ireland. In West Midlands, 6 of the 12 cancers initially treated with conservation surgery, which were eventually converted to mastectomy, had three or more operations.

INITIALLY TREATED WITH CONSERVATION SURGERY BUT WENT ON TO HAVE A MASTECTOMY								
	Invasive cancers						Non-invasive or micro-invasive cancers	
	B5b		C5 only, no B5		B5a		B5a	
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
N East, Yorks & Humber	70	8	7	7	12	21	32	12
East Midlands	39	6	1	33	6	22	7	6
East of England	43	5	0	0	13	28	23	11
London	43	6	1	4	4	11	21	11
South East Coast	29	5	3	4	10	21	12	7
South Central	33	5	1	5	7	17	16	13
South West	47	5	5	8	11	24	17	9
West Midlands	42	5	3	7	12	30	26	15
North West	53	6	13	9	10	19	28	14
Wales	33	7	0	0	4	11	9	8
Northern Ireland	13	11	2	8	3	33	0	0
Scotland	36	5	0	0	5	13	5	4
United Kingdom	**481**	**6**	**36**	**7**	**97**	**20**	**196**	**10**

Shaded if 5% or more above the value for the UK as a whole and more than one cancer is included

Figure 45 shows that in the UK as a whole, 7% of all cancers with a non-operative diagnosis, which were initially treated with conservation surgery, were eventually converted to mastectomy. This varied between 5% in Scotland and 10% Northern Ireland (18 cases). In the UK as a whole, 19% of all cancers with a non-operative diagnosis, which were initially treated with conservation surgery, had repeat therapeutic operations (conservation surgery or mastectomy) to clear margins. This varied from 14% in Scotland to 25% in South East Coast.

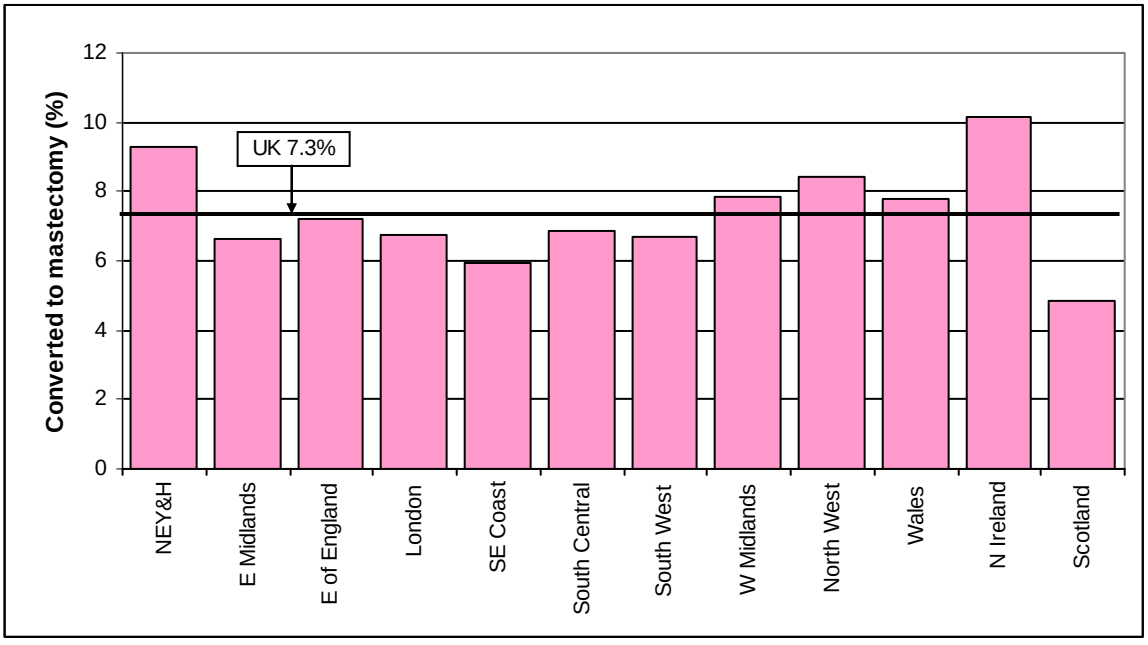

Figure 45: Proportion of cancers which were initially treated with conservation surgery and which were eventually converted to mastectomy

7.4 Repeat Operation Rates Involving the Axilla

One reason for undertaking repeat operations for invasive cancers is to ascertain the nodal status where axillary surgery has not been performed at the first operation. The following table summarises how the proportions of invasive cancers with axillary surgery undertaken in each region at first and repeat operations varies with the non-operative diagnostic result.

PROPORTION OF INVASIVE CANCERS WITH AXILLARY SURGERY AT 1ST AND LATER OPERATIONS

Region	B5b (Table 63)			C5 (Table 65)			B5a (Table 69)		
	Total	1st Op	Later Op	Total	1st Op	Later Op	Total	1st Op	Later Op
N East, Yorks & Humber	*99*	*99*	*0*	*100*	*98*	*2*	*89*	*47*	*42*
East Midlands	*99*	*99*	*0*	*100*	*100*	*0*	*98*	*57*	*41*
East of England	*98*	*97*	*1*	*89*	*89*	*0*	*89*	*49*	*40*
London	*97*	*96*	*1*	*97*	*97*	*0*	*89*	*53*	*36*
South East Coast	*97*	*97*	*0*	*96*	*91*	*4*	*82*	*45*	*37*
South Central	*99*	*99*	*0*	*96*	*96*	*0*	*85*	*40*	*44*
South West	*99*	*98*	*0*	*100*	*97*	*3*	*88*	*37*	*51*
West Midlands	*99*	*99*	*0*	*100*	*100*	*0*	*95*	*40*	*55*
North West	*99*	*98*	*1*	*99*	*98*	*1*	*85*	*55*	*30*
Wales	*100*	*99*	*1*	*100*	*67*	*33*	*96*	*69*	*27*
Northern Ireland	*99*	*97*	*1*	*97*	*97*	*0*	*50*	*25*	*25*
Scotland	*99*	*98*	*1*	*100*	*100*	*0*	*98*	*46*	*52*
United Kingdom	***99***	***98***	***1***	***98***	***96***	***2***	***89***	***48***	***41***

In the UK as a whole, axillary surgery was performed for 99% of invasive cancers with a B5b (Invasive) core biopsy. For 98% of these cancers, the axillary surgery was carried out at the first operation and only 1% (54 cancers) had their axillary surgery in a repeat operation. 148 cancers (1%) had no axillary procedure recorded (Table 63). 32 of these cancers were in London and 21 in East of England. Regional QA reference centres and regional QA surgeons should audit these cancers to ensure that the axilla has not been under-treated. A similar picture was apparent for invasive cancers diagnosed by C5 cytology only, with 98% having axillary surgery. For 96% of these cancers, the axillary surgery was carried out at the first operation. 13 cancers (2%) did not have any axillary procedure recorded (Table 65). Regional QA reference centres and regional QA surgeons should audit these cancers to ensure that the axilla has not been under-treated.

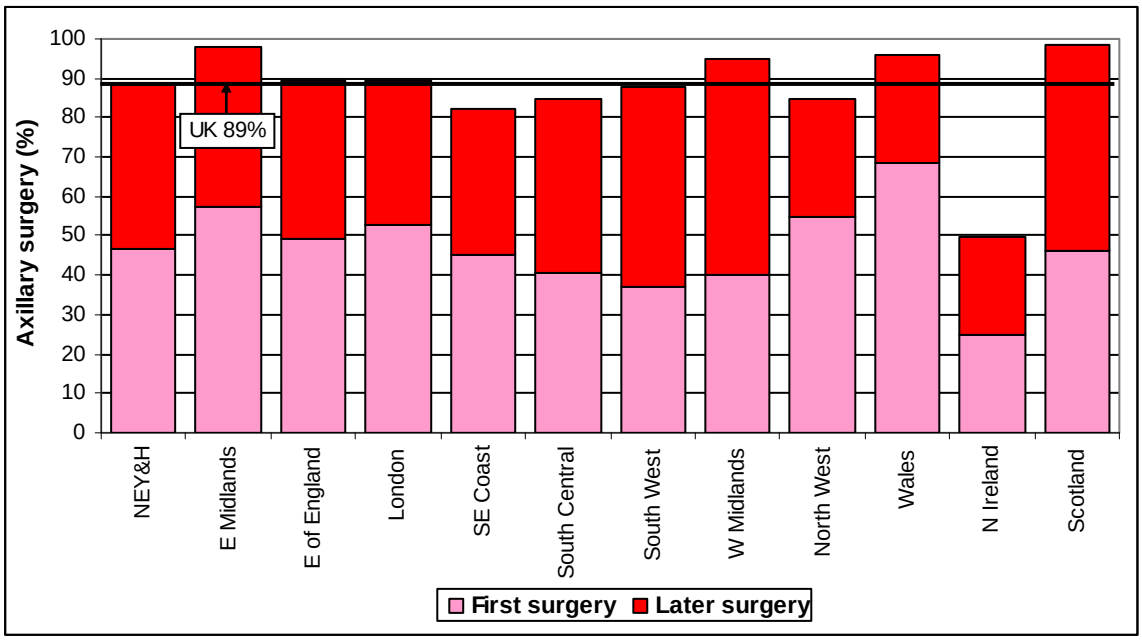

Figure 46 (Table 69) : Variation in proportion of invasive cancers with B5a (Non-invasive) non-operative diagnosis and axillary surgery at first and repeat operations

In the UK as a whole, 89% of invasive cancers with a B5a (Non-invasive) non-operative diagnosis had axillary surgery. This varied from 50% in Northern Ireland (6 cancers) to 98% in East Midlands and Scotland. Overall, 48% of invasive cancers with a B5a (Non-invasive) non-operative diagnosis had their axillary surgery at the first operation, with repeat operations providing nodal data for 41%. Figure 46 shows how the proportion of axillary surgery carried out at first and repeat operations for

invasive cancers with a B5a (Non-invasive) non-operative diagnosis varied in different regions. The proportion of these cancers which had their axillary surgery at the first operation, was highest in Wales (69%) and lowest in Northern Ireland (25%). In the UK as a whole, 77 (11%) B5a (Non-invasive) cancers found to be invasive after surgery did not have any axillary procedure recorded.

INVASIVE CANCERS WITH NO AXILLARY OPERATION

	B5b (Table 63)		C5 only, no B5 (Table 65)		B5a (Table 69)	
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**
N East, Yorks & Humber	12	1	0	0	11	11
East Midlands	6	1	0	0	1	2
East of England	21	2	4	11	7	11
London	32	3	1	3	6	11
South East Coast	19	3	4	4	11	18
South Central	9	1	1	4	8	15
South West	14	1	0	0	8	12
West Midlands	9	1	0	0	3	5
North West	13	1	2	1	13	15
Wales	2	0	0	0	2	4
Northern Ireland	2	1	1	3	6	50
Scotland	9	1	0	0	1	2
United Kingdom	**148**	**1**	**13**	**2**	**77**	**11**

Shaded if 5% or more above the value for the UK as a whole

The summary table above shows the proportion of invasive cancers in each region with no axillary surgery recorded. Overall, 238 invasive cancers had no surgery to the axilla recorded. Only 1% of invasive cancers with a B5b (Invasive) core biopsy and 2% of invasive cancers with C5 cytology only had no axillary procedure recorded. In contrast, in the UK as a whole, 11% of invasive cancers with a B5a (Non-invasive) core biopsy (77 cancers) had no surgery to the axilla recorded. This varied from 1 cancer in East Midlands and Scotland to 13 cancers (15%) in North West and 6 cancers (50%) in Northern Ireland.

INVASIVE CANCERS WITH A B5A NON-OPERATIVE DIAGNOSIS WITH NO AXILLARY OPERATION

	2004/05		2005/06		2006/07	
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**
N East, Yorks & Humber	4	6	2	2	11	11
East Midlands	1	2	4	7	1	2
East of England	9	23	7	16	7	11
London	13	21	16	21	6	11
South East Coast	7	16	9	11	11	18
South Central	7	18	4	8	8	15
South West	7	11	7	8	8	12
West Midlands	4	7	9	14	3	5
North West	3	11	2	6	13	15
Wales	2	5	3	6	2	4
Northern Ireland	1	20	3	30	6	50
Scotland	2	4	2	4	1	2
UK	**60**	**11**	**68**	**10**	**77**	**11**

Shaded if 5% or more above the value for the UK as a whole

The table above shows how the number and proportion of invasive cancers with a B5a (Non-invasive) core biopsy which had no axillary operation recorded has varied in each region over the last 3 audit periods. According to the nodal information audit conducted by regional QA reference centres for the 2004/05 audit, 40% of the cases with either no nodal status recorded or with their nodal status determined on the basis of less than 4 nodes (excluding cases with SLNB) were data recording

errors. Regional QA reference centres and regional QA surgeons should therefore audit all 2006/07 invasive cancers with no axillary operations to ascertain whether the data for these cases are recorded correctly and, if so, why their nodal status was not determined.

COMMENTS:

- In the UK as a whole, 17% of cancers with a proven non-operative diagnosis by C5 cytology and/or B5 core biopsy underwent more than one therapeutic operation. This varied from 13% in Northern Ireland to 21% in South East Coast.
- 16% of invasive cancers and 17% of non-invasive cancers had more than one therapeutic operation. The proportion of invasive cancers having a repeat therapeutic operation varied from 12% in Northern Ireland to 19% in North East, Yorkshire & Humber, South East Coast and South West. The proportion of non-invasive cancers having a repeat therapeutic operation varied from 12% in Scotland to 21% in West Midlands.
- Invasive cancers with B5b (Invasive) core biopsy had an initial mastectomy rate of 21% and non-invasive or micro-invasive cancers with a B5a (Non-invasive) core biopsy had an initial mastectomy rate of 26%. Invasive cancers with a B5a (Non-invasive) core biopsy had the highest initial mastectomy rate (33%).
- 12% of the 539 surgically treated invasive cancers diagnosed by C5 Cytology only had a mastectomy as their first therapeutic operation. 18 of these cancers were in North East, Yorkshire & Humber and 16 in North West. QA reference centres and QA surgeons should audit these cases to determine why cancers with unconfirmed invasive status had a mastectomy as an initial operation.
- Invasive cancers with B5b (Invasive) core biopsy and those diagnosed on the basis of C5 cytology alone had fewest repeat operations (14% and 18% respectively). Invasive cancers with a B5a (Non-invasive) core biopsy had a repeat operation rate of 51% and non-invasive or micro-invasive cancers with a B5a (Non-invasive) core biopsy had a repeat operation rate of 20%.
- In the UK as a whole, 12% of cancers underwent repeat conservation operations to clear involved margins and 7% of cancers had repeat operations which converted initial conservative operations to a mastectomy.
- In the UK as a whole, axillary surgery was performed for 99% of invasive cancers with a B5b (Invasive) core biopsy. For 98% of these cancers, the nodal status was determined at the first operation.
- For 96% of invasive cancers diagnosed by C5 cytology only, axillary surgery was performed at the first therapeutic operation, with 2% having their axillary surgery at a repeat operation.
- 89% of invasive cancers with a B5a (Non-invasive) diagnosis had axillary surgery. 48% of these cancers had their axillary surgery at the first operation, with repeat operations providing nodal data for the additional 41%.
- 148 invasive cancers with a B5b (Invasive) core biopsy, 13 invasive cancers with C5 cytology and 77 invasive cancers with a B5a (Non-invasive) core biopsy had no axillary procedure recorded. The results of the regional nodal audit of 2004/05 cases suggest that this could be a data collection problem. However, if the data do correctly reflect clinical practice, these cases should be audited by regional QA reference centres and regional QA surgeons to ensure that the axilla has not been under-treated.

CHAPTER 8
ADJUVANT THERAPY

Surgeons were asked to supply radiotherapy, chemotherapy and hormonal therapy information for cancers detected through screening between 1 April 2005 and 31 March 2006, the period covered by the previous screening audit. Oestrogen receptor (ER), progesterone receptor (PgR) and HER-2 status were also requested. The cut off point for adjuvant treatment was 31 March 2007, allowing a minimum of 12 months follow up for each case. In this year's audit, the final invasive status has been derived by taking into account the core biopsy result and the surgical histology.

Note: 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.

8.1 Data Completeness for the Adjuvant Therapy Audit

The 2005/06 ABS at BASO audit reported tumour characteristics and primary treatment data for 15,944 screen detected breast cancers. When data for these cases were requested for inclusion in this year's adjuvant audit, 9 additional cases which were not included in last year's main audit were identified. A further 7 cases have been excluded from the adjuvant audit because they were found not to be breast cancers. Thus, 15,946 cases were eligible for inclusion in the adjuvant therapy audit. Of these, 662 (4%) had no adjuvant data supplied. 1,633 cases (10%) were excluded from the audit due to incomplete surgery data or because the woman had had a previous cancer. Following these exclusions, 13,651 cases (86%) were included in the adjuvant therapy audit. Figure 47 shows the variation in data completeness between regions. East Midlands had the highest proportion of eligible cases (99%). South East Coast had the lowest proportion of eligible cases because no adjuvant data were supplied for 27% of their cancers and 33% of their cases were excluded (Table 70).

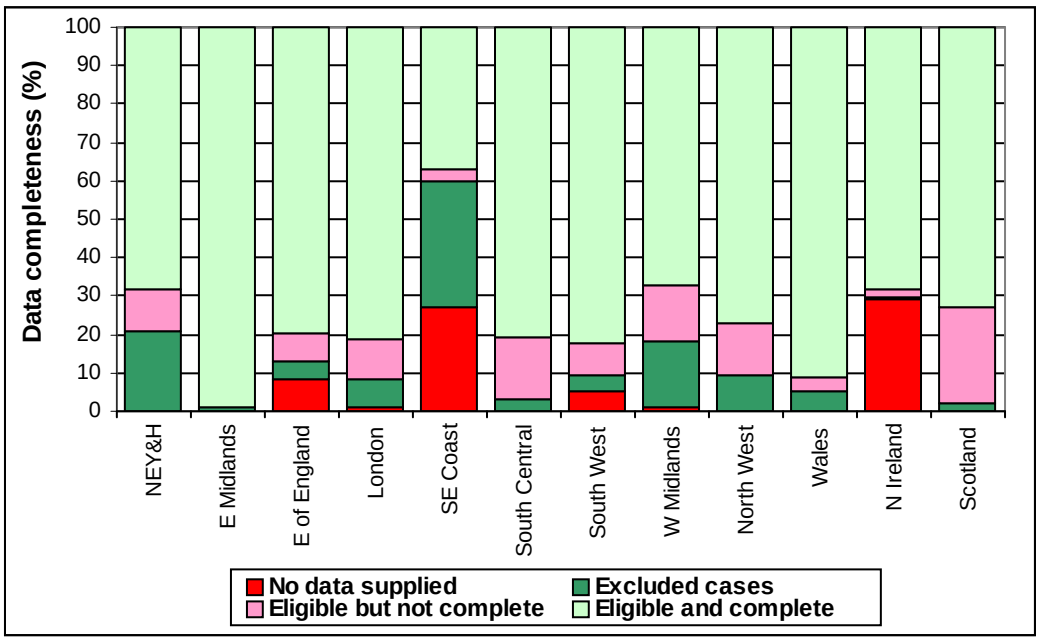

Figure 47 (Table 70): Data completeness of adjuvant audit data

In the UK as a whole, data completeness for radiotherapy, chemotherapy and hormone therapy was 94%, 96% and 95% respectively for the 13,651 eligible cases included in the audit for which adjuvant therapy data were supplied. 11,990 (88%) of these cases had radiotherapy, chemotherapy and hormone therapy data available (Table 71). This varied from 74% in Scotland and 100% in East Midlands.

In the UK as a whole, ER status was unknown for 267 (2%) of invasive cancers and for 1,236 (48%) of non-invasive cancers (Figure 48). The proportion of invasive cancers with unknown ER status varied from 0% in Northern Ireland to 5% in London. This might be due to the ER status not being tested or a data collection problem. The proportion of non-invasive cancers with unknown ER status varied from 20% in Northern Ireland to 76% in Wales. Of the 10,648 invasive cancers with known ER status, 9,550 (90%) were ER positive. Only 77% of the 1,362 non-invasive cancers with known ER status were ER positive.

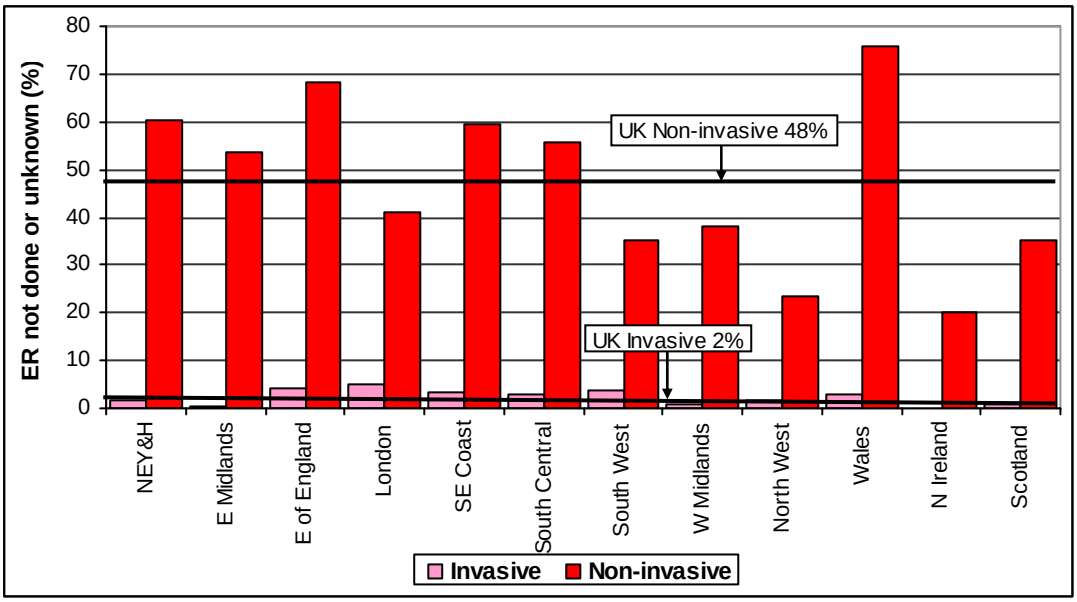

Figure 48 (Table 72): Variation in the proportion of invasive and non-invasive cancers with ER status information unknown or not provided

PgR status data were available for 8,527 (62%) of all cancers (Table 73), compared to 56% in 2005/06. PgR status was known for 85% of the 1,098 ER negative invasive cancers, suggesting that PgR status was preferentially requested for invasive cancers when the ER status was negative. Figure 49 shows that the proportion of ER negative invasive cancers with unknown PgR status varied from 0% in South East Coast and Scotland to 36% in East Midlands.

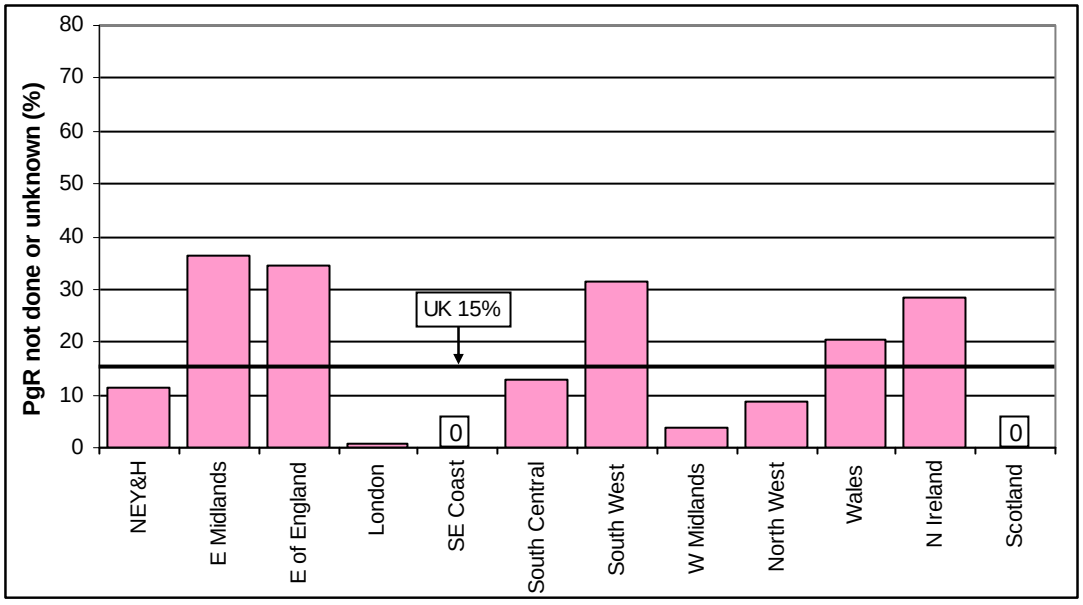

Figure 49 (Table 74): Variation in the proportion of ER negative invasive cases with unknown PgR status

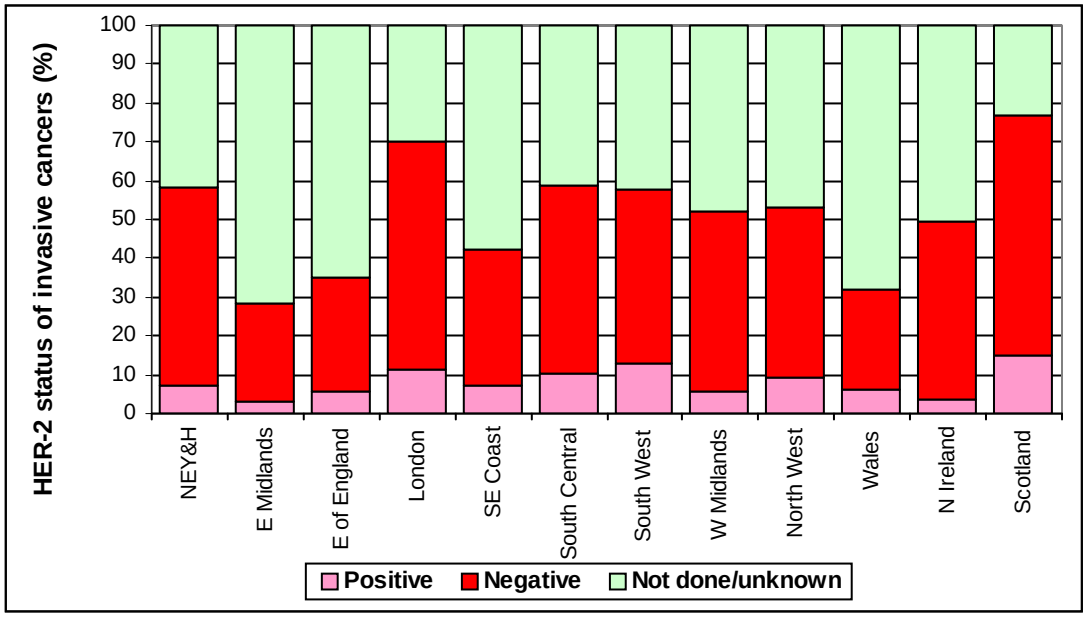

Figure 50 (Table 75): Variation in HER-2 status for invasive cancers

HER-2 status data were available for 53% of the 10,915 invasive cancers included in the audit. This is a considerable increase compared with cases diagnosed in 2004/05 when the HER-2 status data were available for 26% of invasive cancers. The proportion of cases with known HER-2 status varied from 28% in East Midlands to 77% in Scotland (Figure 50). Of the 5,763 invasive cancers with known HER-2 status, 952 (17%) were positive and 4,811 (83%) were negative. Regional QA reference centres and regional QA surgeons should ascertain the reasons why HER-2 status was not available for all the invasive cancers diagnosed in their regions.

8.2 Adjuvant Treatment

Tables 76, 77 and 78 show that, of the cases with known adjuvant data, 8,603 (67%) had started radiotherapy, 2,326 (18%) had started chemotherapy and 9,440 (73%) had started hormone therapy before the audit cut off date.

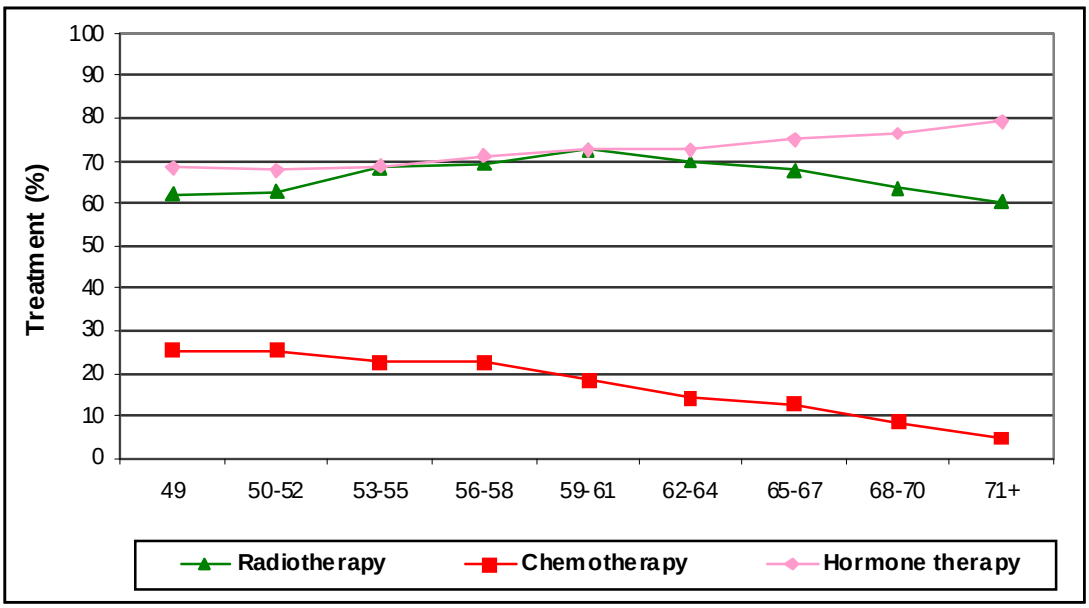

Figure 51 (Table 79): Percentage of women in each age group who had radiotherapy, chemotherapy and hormonal therapy, for cases with complete adjuvant data

A similar proportion of women aged less than 65 had started hormone therapy (73%) or radiotherapy (67%) before the audit cut off date (Figure 51). Hormone therapy was the main adjuvant treatment for

women over 58; being given to 75% of the cases. There was a slight increase with age in the proportion of women receiving hormone therapy. In women aged over 61 there was a decrease in the proportion receiving radiotherapy. As expected for a cohort of screen detected cancers of which a high proportion fall into the good and excellent NPI groups, chemotherapy was the least used adjuvant therapy in women of all ages. However, the proportion of women receiving chemotherapy decreased with age from 26% in women aged less than 50 to 5% in women aged over 70.

11,017 (81%) of the 13,651 cancers included in the audit had one surgical operation (diagnostic or therapeutic), 2,476 (18%) had more than one surgical operation and only 158 cases (1%) had no surgery (Table 81). The first operation was diagnostic for 826 (6%) of the 13,493 women who had surgery (Table 82). Surgery, radiotherapy and hormone therapy as a combination of treatment was the most common treatment pattern, and 44% (5,263 cases) of the cases received this treatment (Figure 52). The second most common treatment combination, received by 16% of cases, was surgery and hormone therapy. Of the 8,603 women given radiotherapy, 7,153 (83%) had one operation and 1,428 (17%) had more than one operation (Table 83). Of the 2,326 women given chemotherapy 1,840 (79%) had one operation, 455 (20%) had more than one operation and 31 (1%) had no surgery (Table 84).

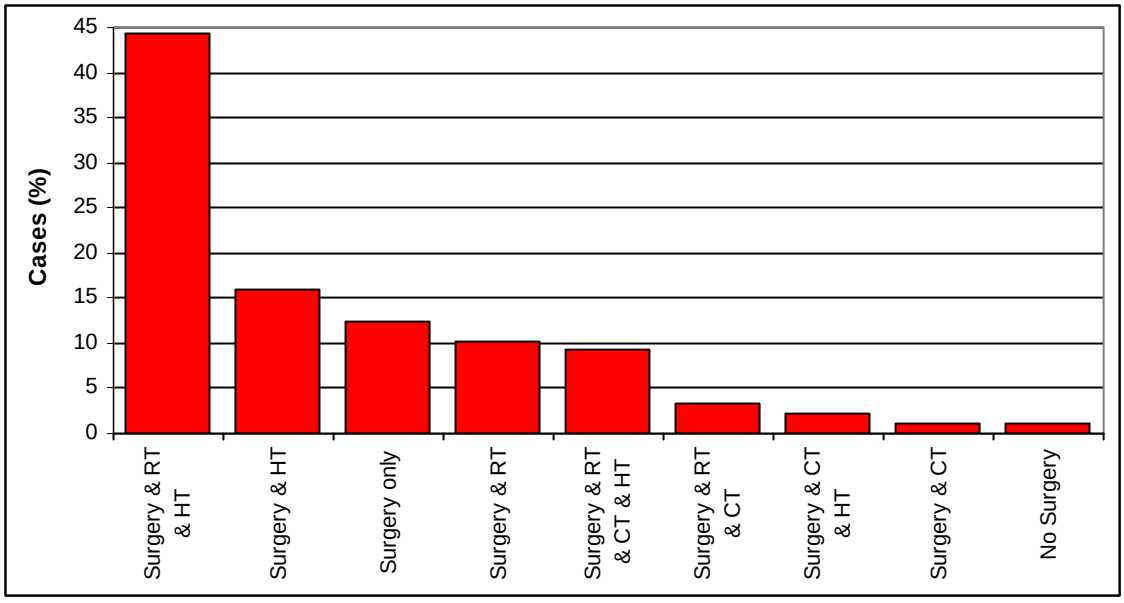

Figure 52 (Table 80): Combinations of treatment, expressed as a percentage of cases with complete adjuvant data

COMMENTS:

- ER status was unknown for 2% of invasive cancers and for 48% of non-invasive cancers. 87% of invasive cancers were ER positive.
- PgR status data were available for 85% of ER negative invasive cancers.
- HER-2 status data were available for 53% of the invasive cancers. Of the 5,763 invasive cancers with known HER-2 status, 17% were positive. Regional QA reference centres and regional QA surgeons should ascertain the reasons why HER-2 status was not available for all the invasive cancers diagnosed in their regions.
- Hormone therapy and radiotherapy were the main adjuvant treatments used for women in all age groups.
- Chemotherapy was the least used adjuvant therapy. The proportion of women receiving chemotherapy decreased with age from 26% in women aged less than 50 to 5% in women aged over 70.
- 44% of women received the most common treatment for screen detected breast cancer in the UK which was surgery, radiotherapy, and hormone therapy.

8.3 Time Between Assessment, Surgery and Radiotherapy

Quality Objective	**To minimise any delay for women who require treatment for screen detected breast cancer**
Minimum Standard	**90% of women should be admitted for treatment within two months of the first assessment visit**
Target Standard	**100% of women should be admitted for treatment within two months of the first assessment visit**

(Quality Assurance Guidelines for Surgeons in Breast Cancer Screening, November 2003, NHSBSP Publication No 20)

Tables 85 to 88 show the regional variation in the cumulative percentages of cases having various therapies within 14, 30, 60, 90, 120 and 200 days. In Figures 53 and 54 the cumulative percentage curve for the UK as a whole is drawn as a solid line and dashed lines represent the regions with the maximum and minimum cumulative percentages at each point.

Overall, 93% of women with a non-operative diagnosis had their therapeutic surgery within 60 days of their assessment (Figure 53), but only 86% of women who had diagnostic surgery had their open surgical biopsy within 60 days of their assessment. The overall median waits for the former and the latter women were 29 and 36 days respectively. This shows that it takes longer on average for a woman to have her first surgery when it is diagnostic in intent than to have a first operation that is therapeutic. This is probably because cases without a non-operative diagnosis are often more complex and therefore will usually have a longer period during which attempts are made to obtain a non-operative diagnosis.

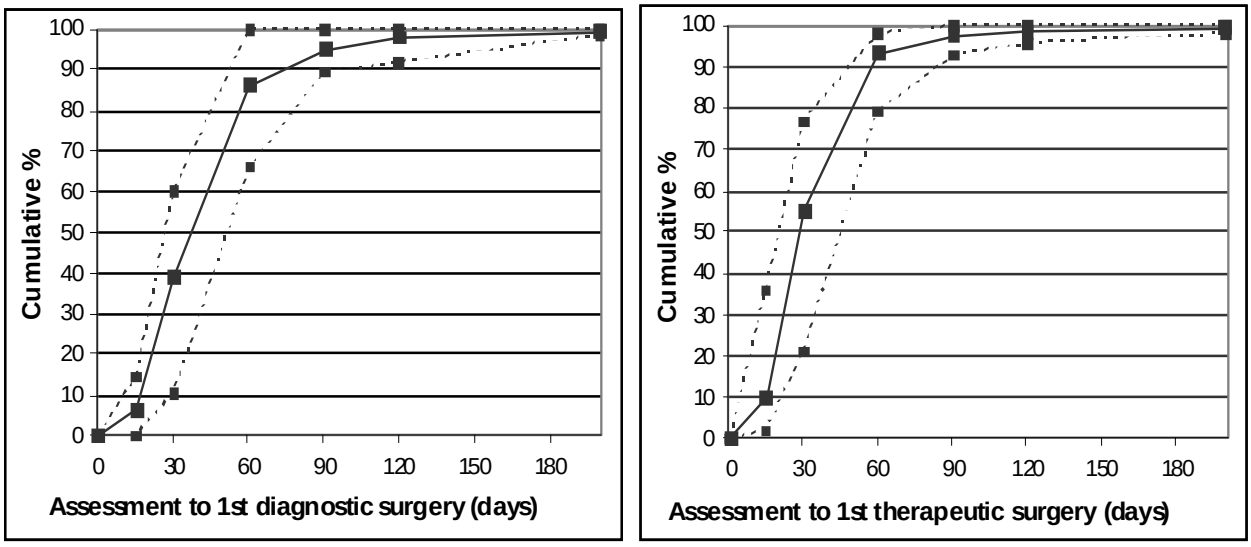

Figure 53 (Tables 95 & 96): The cumulative percentage of cases with diagnostic surgery (left) and the cases with a non-operative diagnosis (right) who had therapeutic surgery up to 200 days after assessment

The left hand graph in Figure 54 shows the time taken from final surgery to radiotherapy, excluding surgically-treated cases with chemotherapy. In the UK as a whole, only 40% of women received radiotherapy within 60 days of their final surgery and 78% within 90 days. 82 women (1%) had not received radiotherapy 200 days after their final surgery. Regional QA reference centres should review these cases. The right hand graph in Figure 54 shows that only 36% of the women who had radiotherapy had started treatment within 90 days of their first assessment. 4% of women had not started radiotherapy even 200 days after their first assessment.

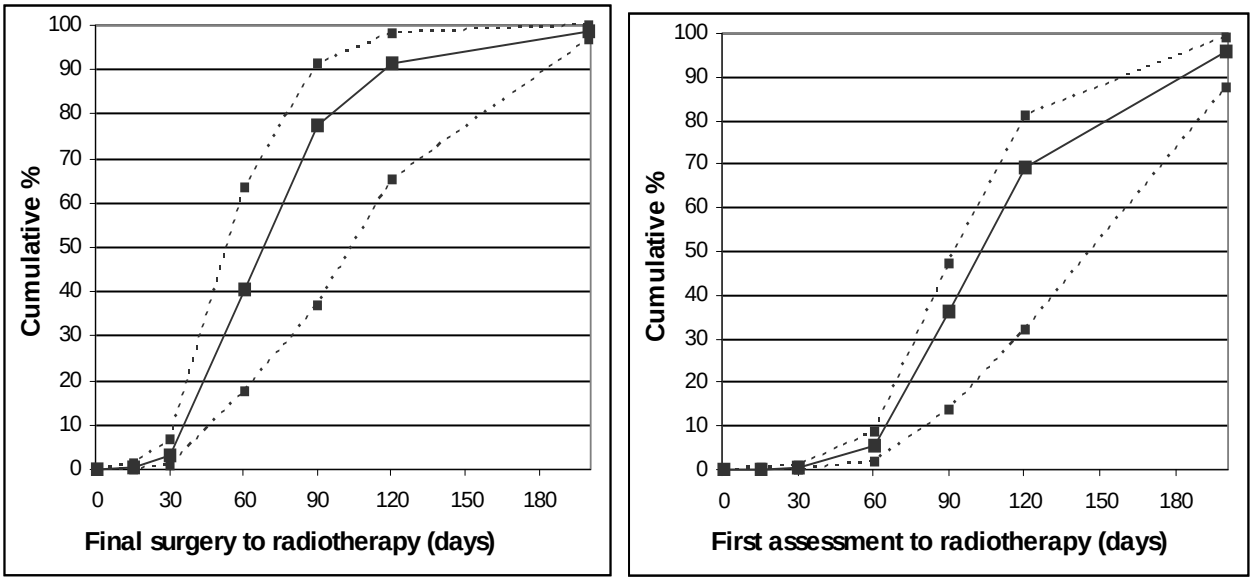

Figure 54 (Tables 87 & 88) : The cumulative percentage of cases with surgery and adjuvant radiotherapy, that had radiotherapy up to 200 days after final surgery (left) and first assessment (right).

The preceding table summarises the median number of days from assessment to diagnostic and therapeutic surgery, and from assessment to radiotherapy and final surgery to radiotherapy in each region. In the UK as a whole for cases which did not have chemotherapy, the median time between final surgery and radiotherapy was similar for patients undergoing one or more surgical operations (66 or 63 days respectively) but varied widely between regions. The longest times were in North East, Yorkshire & Humber (112 days) and South East Coast (102 days). The shortest times were in Scotland (53 days) and East Midlands (57 days). In the Cancer Reform Strategy published in December 2007, a new radiotherapy waiting times standard was introduced which specifies that the time between the date when a person is determined to be 'fit to treat' and the start of radiotherapy should be no more than 31 days. If this standard is to be achieved, considerable reductions in the time between final surgery and radiotherapy will be required in most regions.

MEDIAN DAYS BETWEEN THERAPIES

	Assessment to …				***Final surgery to …***	
Region	***Diagnostic surgery*** *(Table 85)*	***Therapeutic surgery*** *(Table 86)*	***RT (1 op)****	***RT (>1op)****	***RT (1 op)****	***RT (>1 op)****
N East, Yorks & Humber	*34*	*27*	*137*	*143*	*112*	*74*
East Midlands	*40*	*28*	*88*	*125*	*58*	*57*
East of England	*30*	*29*	*92*	*122*	*62*	*59*
London	*38*	*34*	*96*	*123*	*62*	*55*
SE Coast	*52*	*42*	*134*	*189*	*93*	*102*
South Central	*32*	*27*	*91*	*126*	*65*	*67*
South West	*40*	*34*	*105*	*130*	*71*	*67*
West Midlands	*38*	*27*	*91*	*132*	*64*	*62.5*
North West	*35*	*29*	*97*	*133*	*67*	*61*
Wales	*27*	*25*	*99*	*128*	*75*	*75*
Northern Ireland	*29*	*21*	*97*	*127*	*70*	*75*
Scotland	*41*	*29*	*89*	*124*	*53*	*55*
United Kingdom	***36***	***29***	***97***	***129***	***66***	***63***

*excludes cases with chemotherapy

COMMENTS:

- It took longer for women without a non-operative diagnosis to undergo an open biopsy than women with non-operative diagnosis of breast cancer to have their first surgery. This is probably because cases without a non-operative diagnosis are often more complex and therefore will usually have a longer period during which attempts to obtain a non-operative diagnosis are made.
- Only 40% of cases received radiotherapy within 60 days of their final surgery. Women in North East, Yorkshire & Humber experienced the longest waits for radiotherapy.
- If the new radiotherapy waiting times standard introduced in the Cancer Reform Strategy is to be achieved, considerable reductions in the time between final surgery and radiotherapy will be required in most regions

8.4 Combinations of Treatment According to Tumour Characteristics

This section examines the combinations of treatment given to tumours with various prognostic characteristics. It is clear that different screening units followed different protocols. It is hoped that by presenting analyses for five specific propositions, informative discussions to agree best practice can take place.

8.4.1 Conservation Surgery and Radiotherapy

PROPOSITION 1

Women with invasive breast cancer treated with conservation surgery should normally receive radiotherapy

Of the 12,767 cases with radiotherapy data available, 79% were invasive and 20% were non-invasive (Table 89). 7,316 (72%) of the invasive cancers were treated with conservation surgery (Table 90). Of these, 581 (8%) did not have adjuvant radiotherapy recorded (Table 91). Figure 55 shows the variation in the proportion of conservatively treated invasive cancers and non-invasive cancers that did not receive adjuvant radiotherapy. For invasive cancers, the proportions without radiotherapy recorded varied from 2% in East Midlands to 14% in North East, Yorkshire & Humber and 15% in Scotland. Of the 1,719 non-invasive cancers treated with conservation surgery, 814 (47%) did not have adjuvant radiotherapy recorded (Table 94). This varied from 32% in East of England to 69% in South East Coast.

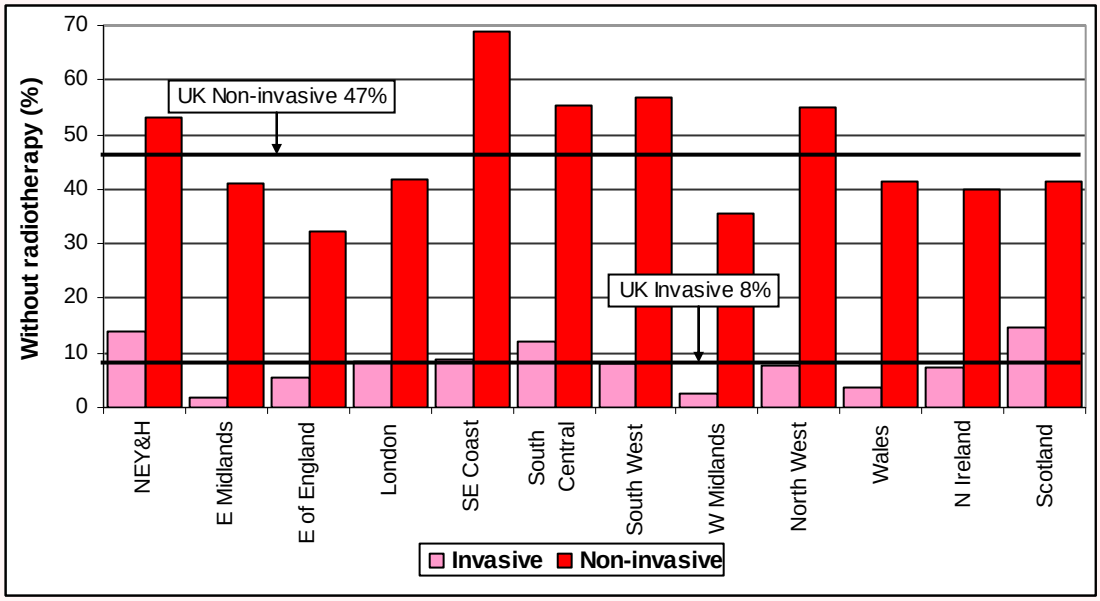

Figure 55 (Tables 91 & 94): The proportion of conservatively treated invasive cancers and non-invasive cancers that did not receive radiotherapy

In the UK as a whole, the majority (61%) of conservatively treated invasive cancers not given adjuvant radiotherapy were small (<15mm diameter) (Table 92). However, 19% of conservatively treated invasive cancers not given adjuvant radiotherapy were larger than 20mm in diameter, 13% were Grade III and 13% were node positive (Table 93). Regional QA reference centres and regional QA surgeons should determine the reasons why these larger, high grade and/or node positive conservatively treated invasive cancers do not appear to have received adjuvant radiotherapy.

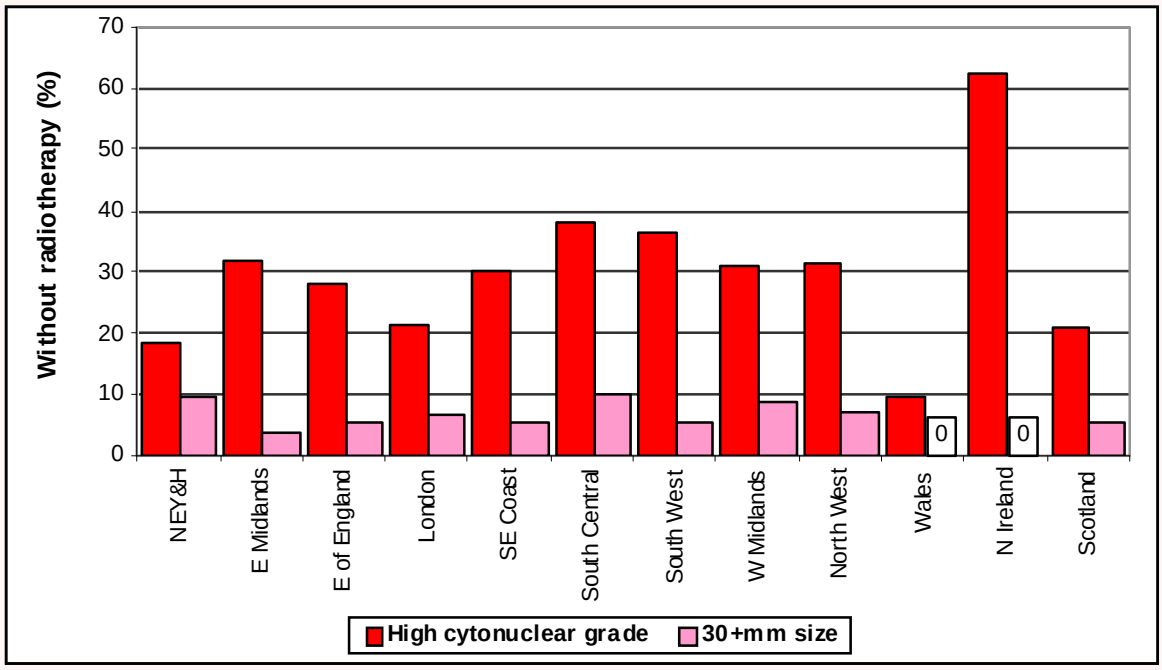

Figure 56 (Tables 95 & 96): The proportion of conservatively treated non-invasive cancers with high cytonuclear grade or size greater than 30mm which did not receive radiotherapy

Figure 56 shows the proportion of conservatively treated high cytonuclear grade non-invasive cancers which did not receive radiotherapy and the proportion of conservatively treated non-invasive cancers with size greater than 30mm that did not receive radiotherapy. 28% (231) of non-invasive cancers not given adjuvant radiotherapy were high cytonuclear grade (Table 95), and 23% (191) were at least 15mm in diameter (Table 96). Provided that the tumour margins were adequate, it may be acceptable for conservatively treated non-invasive cancers to not receive adjuvant radiotherapy. However, regional QA reference centres and regional QA surgeons should audit the treatment provided to larger, high cytonuclear grade non-invasive cancers to ensure that these cancers did not receive less than optimal therapy.

CONSERVATIVELY TREATED CANCERS WITHOUT RADIOTHERAPY

	Invasive						***Non-invasive***					
	2003/04		***2004/05***		***2005/06***		***2003/04***		***2004/05***		***2005/06***	
Region	***No.***	%	***No.***	%	***No.***	%	***No.***	%	***No.***	%	***No.***	%
N East, Yorks & Humber	*38*	*8*	*68*	*9*	*108*	*14*	*64*	*52*	*97*	*46*	*104*	*53*
East Midlands	*27*	*5*	*24*	*5*	*13*	*2*	*52*	*40*	*63*	*49*	*57*	*41*
East of England	*26*	*5*	*24*	*5*	*44*	*6*	*64*	*47*	*64*	*46*	*57*	*32*
London	*40*	*8*	*46*	*7*	*60*	*9*	*66*	*47*	*57*	*45*	*75*	*42*
South East Coast	*68*	*13*	*99*	*23*	*26*	*9*	*78*	*55*	*97*	*66*	*53*	*69*
South Central	*77*	*14*	*48*	*9*	*79*	*12*	*56*	*52*	*77*	*62*	*79*	*55*
South West	*49*	*8*	*45*	*6*	*69*	*8*	*99*	*55*	*110*	*58*	*138*	*57*
West Midlands	*12*	*3*	*56*	*8*	*18*	*3*	*35*	*53*	*64*	*42*	*45*	*35*
North West	*73*	*11*	*113*	*15*	*66*	*8*	*66*	*50*	*114*	*59*	*99*	*55*
Wales	*52*	*20*	*7*	*2*	*15*	*4*	*53*	*64*	*26*	*41*	*42*	*42*
Northern Ireland	*8*	*8*	*3*	*3*	*8*	*7*	*8*	*30*	*4*	*17*	*8*	*40*
Scotland	*32*	*6*	*35*	*8*	*75*	*15*	*33*	*26*	*35*	*36*	*57*	*41*
UK	***502***	***9***	***568***	***9***	***581***	***8***	***674***	***49***	***808***	***51***	***814***	***47***

Shaded if 5% or more above the value for the UK as a whole

The summary table above shows how the number and proportion of conservatively treated invasive and non-invasive cancers with no radiotherapy treatment recorded has varied in each region over the treatment year period from 2003/04 to 2005/06. Regions where the proportion of cancers not receiving radiotherapy is 5% or more in excess of the UK average are shaded.

CONCLUSION 1

92% of women with invasive cancer treated with conservation surgery received adjuvant radiotherapy, compared to only 53% of women with conservatively treated non-invasive cancers.

19% of conservatively treated invasive cancers not given adjuvant radiotherapy were larger than 20mm in diameter, 13% were Grade III and 13% were node positive. Regional QA reference centres and regional QA surgeons should determine the reasons why these larger, high grade and/ or node positive conservatively treated invasive cancers do not appear to have received adjuvant radiotherapy.

28% of non-invasive cancers not given adjuvant radiotherapy were high cytonuclear grade and 23% were at least 15mm in diameter. Provided that the tumour margins were adequate, it may be acceptable for conservatively treated non-invasive cancers to not receive adjuvant radiotherapy. However, regional QA reference centres and regional QA surgeons should audit the treatment provided to larger, high cytonuclear grade non-invasive cancers to ensure that these cancers did not receive less than optimal therapy.

8.4.2 ER Negative, Node Positive Invasive Cancers and Chemotherapy

PROPOSITION 2

Women with ER negative, node positive invasive cancers should normally receive chemotherapy

Of the 13,142 cancers with known chemotherapy data, 277 (2%) were recorded as ER negative, node positive invasive cancers and 738 (6%) were recorded as ER negative, node negative invasive cancers (Table 97). Of the 277 ER negative, node positive invasive cancers, 41 (15%) did not receive chemotherapy (Figure 57). This varied from 0% in Wales and Northern Ireland to 21% in South East Coast and 23% in North East, Yorkshire & Humber.

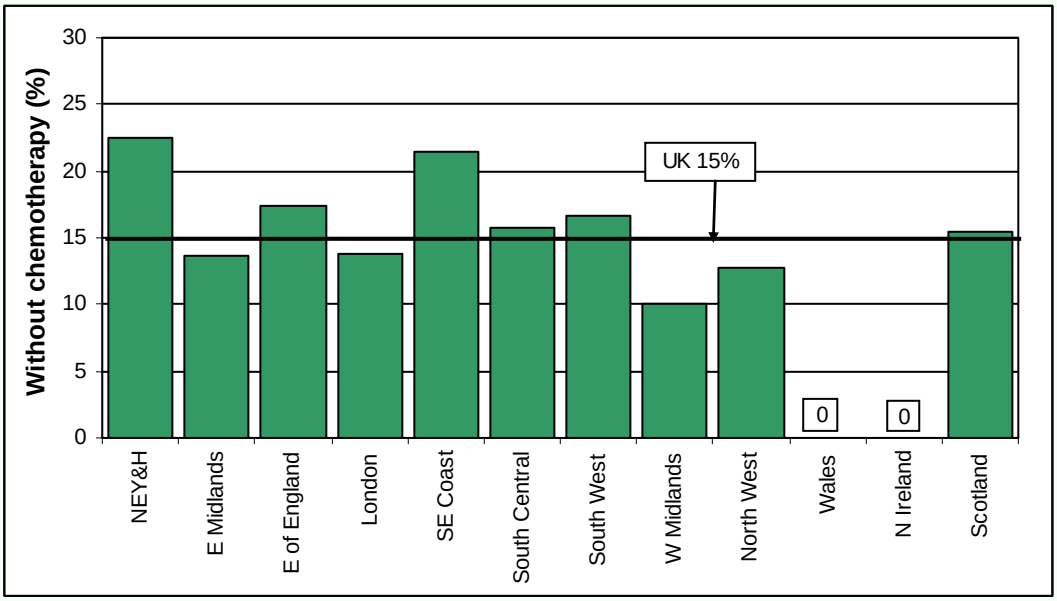

Figure 57 (Table 98): The proportion of ER negative, node positive invasive cancers that did not receive chemotherapy

The following table shows how the proportion of ER negative, node positive invasive cancers not receiving chemotherapy varied with age in the UK as a whole. Older women were much less likely to receive chemotherapy than younger women.

ER NEGATIVE NODE POSITIVE INVASIVE CANCERS			
		Without Chemotherapy	
Age	Total	No.	%
49	3	0	0
50-52	34	3	9
53-55	29	1	3
56-58	47	6	13
59-61	48	5	10
62-64	43	4	9
65-67	36	5	14
68-70	36	12	33
71+	12	5	42

The following table shows how the number and proportion of ER negative, node positive invasive cancers with no chemotherapy treatment recorded has varied in each region for the three year period from 2003/04 to 2005/06. Regions where the proportion of cancers not receiving chemotherapy is 5% or more in excess of the UK average are shaded. Regional QA reference centres and regional QA surgeons should audit these cases to determine whether the absence of chemotherapy treatment data is a true reflection of clinical practice or a data recording issue.

ER NEGATIVE NODE POSITIVE INVASIVE CANCERS WITHOUT CHEMOTHERAPY						
	2003/04		2004/05		2005/06	
Region	No.	%	No.	%	No.	%
N East, Yorks & Humber	8	22	5	16	9	23
East Midlands	1	4	0	0	3	14
East of England	0	0	1	13	4	17
London	3	18	3	19	4	14
South East Coast	3	21	2	13	3	21
South Central	6	33	6	23	3	16
South West	2	11	3	13	4	17
West Midlands	2	10	2	9	2	10
North West	4	19	6	21	5	13
Wales	3	19	0	0	0	0
Northern Ireland	0	0	1	10	0	0
Scotland	7	26	0	0	4	15
UK	**39**	**17**	**29**	**13**	**41**	**15**

Shaded if 5% or more above the value for the UK as a whole

Of the 738 ER negative, node negative invasive cancers, 407 (55%) did not receive chemotherapy (Table 99). This varied from 42% in London and Northern Ireland to 70% in South East Coast. Thus, in most regions, nodal status was taken into account when deciding whether ER negative cancers received chemotherapy. Nodal status made the least difference in London where the highest proportion of ER negative node negative cancers received chemotherapy. Overall, 86% of the 331 ER negative, node negative invasive cancers given chemotherapy were Grade III (Table 100) and 87 (26%) cases were HER-2 positive.

CONCLUSION 2

15% of women with ER negative, node positive invasive cancers did not have chemotherapy recorded compared to 55% of ER negative, node negative invasive cancers. This suggests that nodal status was taken into account when deciding whether women would benefit from chemotherapy.

86% of the 331 ER negative, node negative invasive cancers given chemotherapy were Grade III and 26% were HER-2 positive.

Older women with ER negative, node positive invasive cancers were much less likely to receive chemotherapy than younger women. QA reference centres and QA surgeons in regions where the proportion of cancers not receiving chemotherapy is 5% or more in excess of the UK average should audit their cases to determine whether the absence of chemotherapy treatment data is a true reflection of clinical practice or a data recording issue.

8.4.3 ER Status and Hormone Therapy

PROPOSITION 3

Hormonal therapy (e.g. Tamoxifen) is only beneficial to women with ER positive cancers and women with ER negative, PgR positive cancers

Of the 12,912 cancers with complete hormone therapy data included in the adjuvant therapy analysis, 10,214 (79%) were ER positive, 1,396 (11%) ER negative and for 1,302 (10%) either the ER status were not tested or the ER status was unknown (Table 101). 90% of the ER positive cancers with known hormone therapy data were invasive and 10% non-invasive (Table 102).

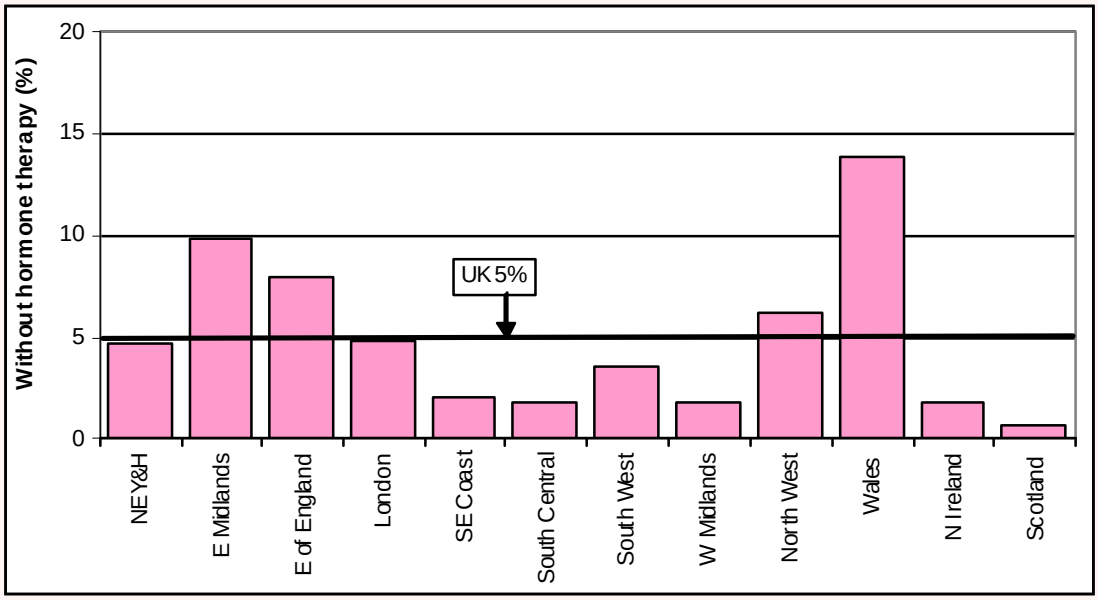

Figure 58 (Table 103): Variation in proportion of ER positive, invasive cancers that did not receive hormone therapy

In the UK as a whole, 469 (5%) ER positive, invasive cancers did not receive hormone therapy (Figure 58). The proportion of ER positive, invasive cancers did not receive hormone therapy varied from 1% in Scotland (7 cancers) to 14% in Wales (77 cancers) (Figure 58). 85% of the ER positive, invasive cancers that did not receive hormone therapy were Grade I or II, 84% were node negative and 72% were <15mm in diameter (Table 104). Figure 59 shows how the proportion of ER positive cancers in the Excellent Prognostic Group treated with hormone therapy varies between screening units. In 3 units (2 in East Midlands and 1 in North West) none of these cancers received hormone therapy and in 36 units they all did.

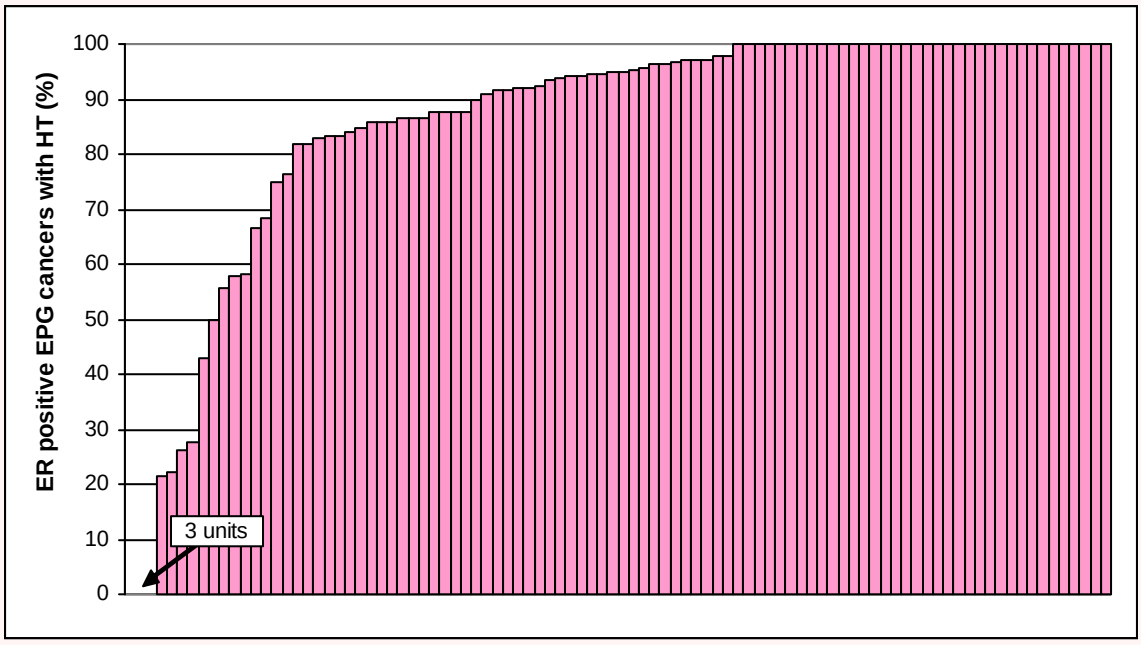

Figure 59: Variation between screening units in the proportion of ER positive, EPG cancers that received hormone therapy

The following table shows how the number and proportion of ER positive invasive cancers with no hormone therapy treatment recorded has varied in each region over the three year period from 2003/04 to 2005/06. Regions where the proportion of cancers not receiving hormone therapy is 5% or more in excess of the UK average are shaded. Regional QA reference centres and regional QA surgeons should audit these cases to determine whether the absence of hormone therapy data is a true reflection of clinical practice or a data recording issue.

ER POSITIVE INVASIVE CANCERS WITHOUT HORMONE THERAPY

	2003/04		***2004/05***		***2005/06***	
Region	***No.***	%	***No.***	%	***No.***	%
N East, Yorks & Humber	*15*	*2*	*12*	*1*	*53*	*5*
East Midlands	*78*	*11*	*90*	*13*	*90*	*10*
East of England	*55*	*10*	*53*	*9*	*71*	*8*
London	*41*	*7*	*39*	*5*	*42*	*5*
South East Coast	*16*	*3*	*28*	*5*	*7*	*2*
South Central	*39*	*6*	*98*	*16*	*13*	*2*
South West	*19*	*3*	*13*	*2*	*34*	*4*
West Midlands	*12*	*2*	*5*	*1*	*14*	*2*
North West	*91*	*11*	*106*	*11*	*59*	*6*
Wales	*167*	*35*	*55*	*12*	*77*	*14*
Northern Ireland	*2*	*2*	*1*	*1*	*2*	*2*
Scotland	*30*	*4*	*13*	*2*	*7*	*1*
UK	***565***	***8***	***513***	***7***	***469***	***5***

Shaded if 5% or more above the value of the UK as a whole

In the UK as a whole, 45% (28 cases) of ER negative, PgR positive invasive cancers did not receive hormone therapy (Table 105). Regional QA reference centres and regional QA surgeons should determine the reasons why hormone therapy was not given to these ER negative, PgR positive cancers.

In the UK as a whole, 99 ER negative cancers (7%) received hormone therapy (Table 106). 34 (34%) of these cancers were PgR positive (Table 105). Given the potential side effects of hormone treatment, regional QA reference centres and regional QA surgeons should determine the reasons why hormone therapy was given to ER negative cancers which were not PgR positive.

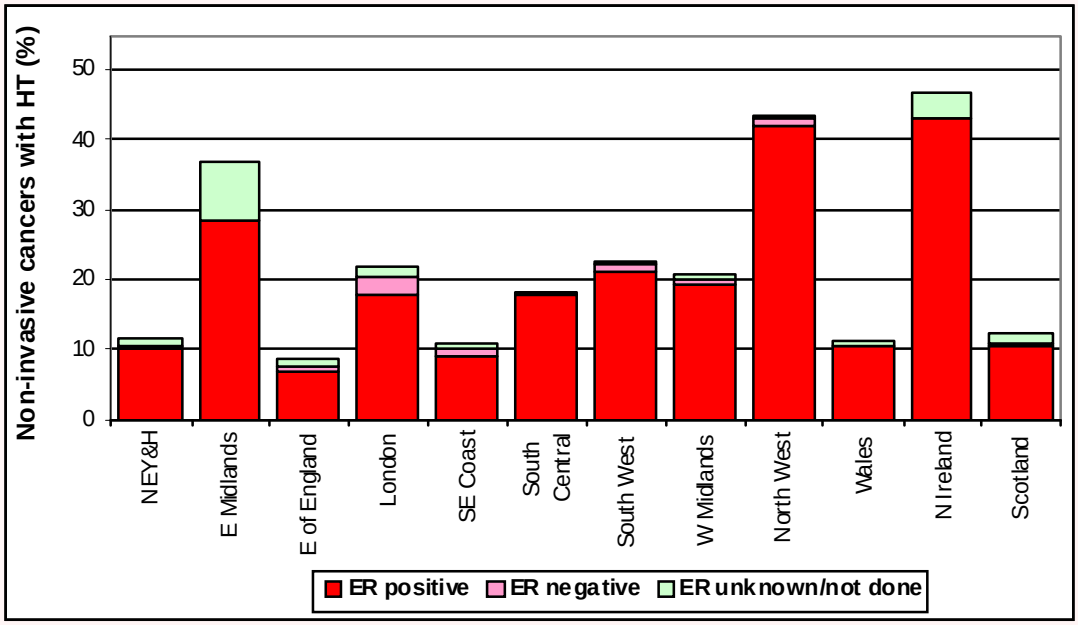

Figure 60 (Table 107): Variation in proportion of non-invasive cancers that received hormone therapy

The proportion of non-invasive cancers treated with hormone therapy varied markedly between regions from 9% in East of England to 47% in Northern Ireland (Table 107). Of the 504 non-invasive cancers with known ER status treated with hormone therapy, 485 were ER positive and 19 were ER negative. A further 40 non-invasive cancers with unknown ER status were also treated with hormone therapy. In East Midlands 8% of the non-invasive cancers were treated with hormone therapy without known ER status recorded. 503 ER positive, non-invasive cancers did not receive hormone therapy (Table 108). Given the potential side effects of hormone treatment, regional QA reference centres and regional QA surgeons should determine the reasons why hormone therapy was given to non-invasive cancers with unknown or negative ER status. The reasons for not giving hormone therapy to ER positive, non-invasive cancers should also be determined.

CONCLUSION 3

The decision to give hormone therapy did appear to depend to a large extent on ER and PgR status. However, 5% of ER positive, invasive cancers and 45% of ER negative, PgR positive invasive cancers did not have hormone therapy recorded. 85% of the ER positive invasive cancers not treated with hormone therapy were Grade I or II, 84% were node negative and 72% were <15mm in diameter. Nevertheless, regional QA reference centres and regional QA surgeons should audit ER and PGR positive cases to determine whether the absence of hormone therapy data is a true reflection of clinical practice or a data recording issue

7% of ER negative cancers did have hormone therapy recorded. Given the potential side effects of hormone treatment, regional QA reference centres and regional QA surgeons should determine the reasons why hormone therapy appears to have been given to invasive and non-invasive cancers with unknown or negative ER and PgR status.

8.4.4 ER Negative, PgR Negative Invasive Cancers and Chemotherapy

PROPOSITION 4

Chemotherapy should be considered as a treatment for ER and PgR negative invasive cancers

In the UK as a whole, 361 (43%) invasive cancers with ER and PgR negative status did not appear to have received chemotherapy (Figure 61). This varied between 36% (35 out of 96 cancers) in

London and 56% (5 out of 9 cancers) in Northern Ireland. In the UK as a whole, 45% of the ER and PgR negative cancers which did not appear to receive chemotherapy were Grade III, 9% were node positive and 19% were HER-2 positive (Table 110). Regional QA reference centres and regional QA surgeons should determine the reasons why chemotherapy therapy does not appear to have been given to ER and PgR negative invasive cancers in poor prognostic groups.

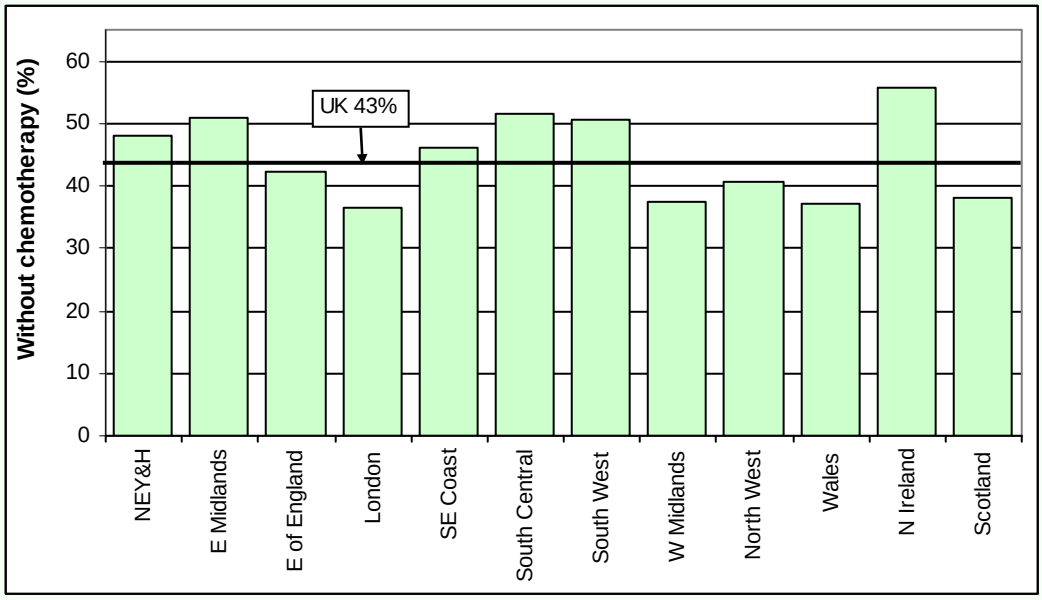

Figure 61 (Tables 110): Proportion of ER negative, PgR negative invasive cancers that did not receive chemotherapy

CONCLUSION 4

43% of ER and PgR negative invasive cancers did not have chemotherapy recorded. 45% of the these cancers were Grade III, 9% were node positive and 19% were HER-2 positive. Regional QA reference centres and regional QA surgeons should determine the reasons why chemotherapy therapy does not appear to have been given to ER and PgR negative invasive cancers in poor prognostic groups.

8.4.5 HER-2 Status and Chemotherapy

PROPOSITION 5

Chemotherapy should be considered as a treatment for HER-2 positive invasive cancers.

In the UK as a whole, HER-2 status was known for 5,763 (53%) of invasive cancers (Table 75). Of these, 925 were HER-2 positive. For 468 (51%) of these cases, no chemotherapy treatment was recorded (Table 111). This varied between 25% (10 out of 40 cases) in Wales to 66% (93 out of 140 cases) in South West. In the UK as a whole, 70% of the HER-2 positive cases with no chemotherapy recorded were greater than 20mm in diameter, 31% were Grade III, 14% were node positive and 44% were in the MPG1, MPG2 or PPG groups (Tables 112 and 113). Regional QA reference centres and regional QA surgeons should audit these cases to determine whether the absence of chemotherapy treatment data is a true reflection of clinical practice or a data recording issue.

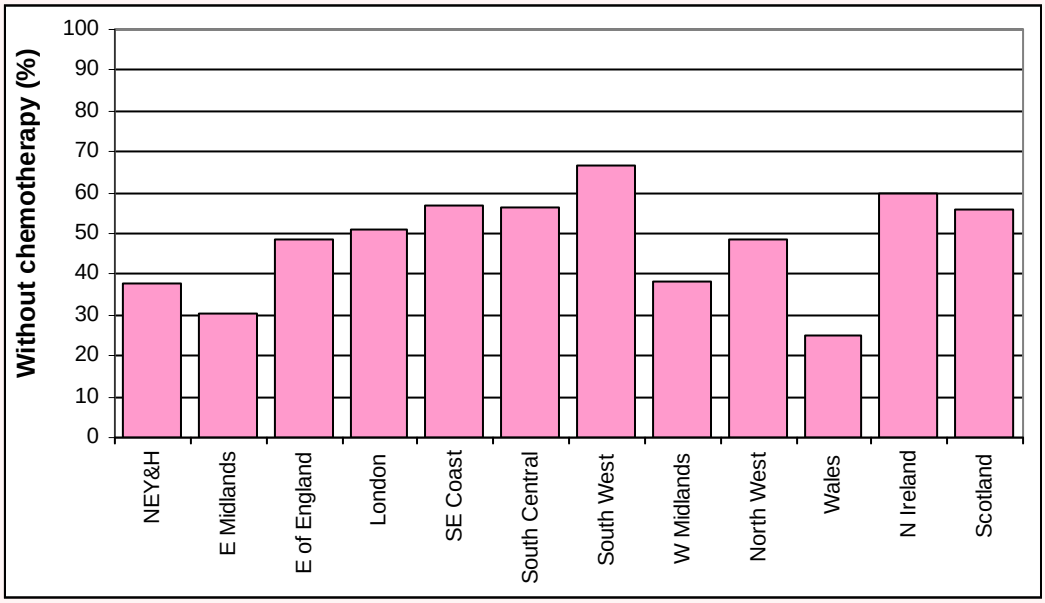

Figure 62 (Table 111): Proportion of HER-2 positive invasive cancers that did not receive chemotherapy

CONCLUSION 3

468 (51%) HER-2 positive cases did not have chemotherapy recorded. In the UK as a whole, 70% of these cases were greater than 20mm in diameter, 31% were Grade III, 14% were node positive and 44% were in the MPG1, MPG2 or PPG groups. Regional QA reference centres and regional QA surgeons should audit these cases to determine whether the absence of chemotherapy treatment data is a true reflection of clinical practice or a data recording issue.

8.4.6 Summary

The following table provides a summary of the proportion of cancers in each region which did not receive treatment consistent with propositions 1 to 5 presented in this section. Regions where the proportion of cancers treated in a manner inconsistent with each proposition was 5% or more in excess of the UK average are shaded.

SUMMARY OF PROPOSITIONS 1, 2, 3, 4 and 5

	Proposition 1		***Proposition 2***	***Proposition 3***			***Proposition 4***	***Proposition 5***
	Invasive conservation surgery, no RT *(Table 91)*	***Non-invasive conservation surgery, no RT*** *(Table 94)*	***ER negative node positive invasive no CT*** *(Table 98)*	***ER positive invasive no HT*** *(Table 103)*	***ER negative PgR positive invasive no HT*** *(Table 108)*	***ER negative with HT*** *(Table 106)*	***ER negative PgR negative invasive no CT*** *(Table 109)*	***HER-2 positive invasive cancers no CT*** *(Table 111)*
Region	***%***	***%***	***%***	***%***	***%***	***%***	***%***	***%***
NEY&H	*14*	*53*	*23*	*5*	*63*	*9*	*48*	*36*
East Midlands	*2*	*41*	*14*	*10*	*18*	*4*	*51*	*30*
E of England	*6*	*32*	*17*	*8*	*67*	*4*	*42*	*48*
London	*9*	*42*	*14*	*5*	*55*	*13*	*36*	*51*
SE Coast	*9*	*69*	*21*	*2*	*71*	*16*	*46*	*57*
South Central	*12*	*55*	*16*	*2*	*37*	*10*	*52*	*56*
South West	*8*	*57*	*17*	*4*	*57*	*7*	*51*	*66*
West Midlands	*3*	*35*	*10*	*2*	*56*	*2*	*38*	*38*
North West	*8*	*55*	*13*	*6*	*30*	*9*	*41*	*49*
Wales	*4*	*42*	*0*	*14*	*33*	*0*	*37*	*25*
N Ireland	*7*	*40*	*0*	*2*	*19*	*4*	*56*	*60*
Scotland	*15*	*41*	*15*	*1*	*79*	*3*	*38*	*56*
UK	***8***	***47***	***15***	***5***	***51***	***7***	***43***	***51***

Shaded if 5% or more above the value for the UK as a whole

CHAPTER 9
SURVIVAL ANALYSIS

UK NHS Breast Screening Programme data for women with breast cancers detected by screening between 1 January 1990 and 31 December 1991 were combined with data recorded by regional cancer registries to analyse breast cancer survival. All cases were followed up to the study end date of 31 December 2006, enabling survival for a period of up to 16 years post diagnosis to be calculated. However, as the number of cases which reach the 16th year is small, 15 year relative survival has been performed for this report. By liaising with the cancer registries serving their population, 10 of the 12 regional QA reference centres were able to provide complete data for this analysis. The cancer registry in Northern Ireland did not exist in 1991 and therefore could not participate in the audit. ISD Scotland was unable to participate in the audit because of other commitments.

Age at diagnosis, invasive grade, invasive tumour size and nodal status were requested from the screening services for cases detected in 1990 and 1991. Tumour characteristics for earlier years were collected in previous audits. Regional QA reference centres were given the opportunity to update the audit database if necessary.

9.1 Survival Analysis Methods

Relative survival is defined as the observed survival in the patient group divided by the expected survival of the general population, matched by age and sex. 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 (*"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)*).

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 were approximated as twice the standard error. Relative survival curves were tested for statistically significant differences using likelihood ratio tests for inequality. Full details can be found in the Surv2 software manual.

9.2 Eligibility and Data Completeness of Cases Included in the Survival Analysis

Details of 9,064 breast cancers detected by screening between 1 January 1990 and 31 December 1991 were submitted to the survival audit. Of the 9,064 cancers submitted, 499 cancers (6%) were excluded if one of the following reasons applied.

- Unknown invasive status (59 cases)
- Case not registered at the regional cancer registry or registered with an unknown diagnosis date (367 cases)
- Screen-detected cancer not confirmed to be the first primary breast tumour, either because it was flagged as a recurrence at the cancer registry/screening unit (36 cases), or because the date of diagnosis at the cancer registry was more than 6 months prior to the screening surgery date without an acceptable explanation (37 cases)

The diagnosis date recorded at the cancer registry was taken for the survival analysis, unless it was incomplete or later than the screening surgery date, in which case the screening surgery date was used. This can occur where the cancer registry has incomplete data for the cancer, for example a registration based only on a death certificate.

DATA COMPLETENESS FOR THE 1990 AND 1991 SURVIVAL AUDIT									
	Not registered		Cases not confirmed to be primary breast cancers**		Incomplete size, grade or nodal status for invasive cancers		Eligible cases		Total number of cases
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	
N East, Yorks & Humber	*196*	*14*	*0*	*0*	*221*	*16*	*1,169*	*85*	***1,378***
East Midlands	*47*	*7*	*0*	*0*	*188*	*27*	*652*	*92*	***706***
East of England	*19*	*2*	*3*	*0*	*530*	*51*	*1,023*	*98*	***1,049***
London	*15*	*1*	*8*	*1*	*387*	*37*	*990*	*96*	***1,034***
South East Coast	*16*	*2*	*18*	*2*	*519*	*57*	*877*	*96*	***914***
South Central	*2*	*0*	*11*	*1*	*161*	*20*	*802*	*98*	***815***
South West	*43*	*5*	*15*	*2*	*579*	*61*	*885*	*94*	***943***
West Midlands	*1*	*0*	*8*	*1*	*571*	*62*	*914*	*99*	***927***
North West	*19*	*2*	*9*	*1*	*626*	*62*	*972*	*97*	***1,004***
Wales	*9*	*3*	*1*	*0*	*39*	*13*	*281*	*96*	***294***
Northern Ireland	*No data supplied*								
Scotland	*No data supplied*								
United Kingdom	***367***	***4***	***73***	***1***	***3,821***	***42***	***8,565***	***94***	***9,064***

**confirmed to be a recurrence or where the cancer diagnosis date in cancer registry is outside audit period

94% of all 9,064 submitted cases are eligible for analysis. The relatively high proportion of unregistered cases in North East, Yorkshire & Humber reflects registration problems in the old Northern Cancer Registry before responsibility for cancer registration in this area was taken over by the new Northern and Yorkshire Cancer Registry and Information Service (NYCRIS).

9.3 Cause of Death

The main advantage of calculating relative rather than cause-specific survival is that knowledge of the cause of death is not required. Cancer registries were asked to supply cause of death for each screen-detected cancer with death recorded before the survival analysis cut-off point (31 December 2006) together with text from the death certificate to give the exact cause of death.

Overall, 47% of the 2,461 deaths among the 7,108 women with invasive breast cancer were recorded as being due to breast cancer, 15% were due to another type of cancer and 28% were due to non cancer related causes. Death cause was unknown for 209 women (8%). There was, however, some regional variation in the proportions of women with invasive cancer recorded as dying from each cause of death. For instance, in North East, Yorkshire & Humber only 25% of the deaths in women with invasive cancer were attributed to the screen-detected breast cancer, compared to 60% in South East Coast and South West (Table 114).

Table 115 shows that there were a total of 46 deaths (22%) recorded amongst the 208 women with micro-invasive cancer detected by screening in 1990 and 1991. 11 were from the breast cancer, 8 from another cancer, and 24 were non-cancer deaths. For 1 case the cause of death was not collected, and 2 causes of death were unknown at the registry. Of the 258 deaths (21%) in the 1,249 women with non-invasive cancer, 76 (29%) were recorded as being due to breast cancer, 68 (26%) were from a cancer other than the screen-detected breast cancer and 92 (36%) were non-cancer deaths. For 6 cases the cause of death was not collected and for 16 cases the causes of death were unknown at the registry (Table 116).

9.4 Relative Survival Rates for Cancers Diagnosed in 1990 and 1991

Figure 63 shows that the overall 15 year relative survival of the invasive cancers diagnosed in England and Wales in 1990 and 1991 is 86.3%, varying from 81.5% in North East Yorkshire & Humber to 95.2% in South East Coast. 15 year relative survival in South East Coast is significantly higher than the UK average and the majority of the other regions at the 95% confidence limit level. It should be noted that the survival in North East, Yorkshire & Humber may be underestimated because of the probable under-ascertainment of live cases by the old Northern Cancer Registry.

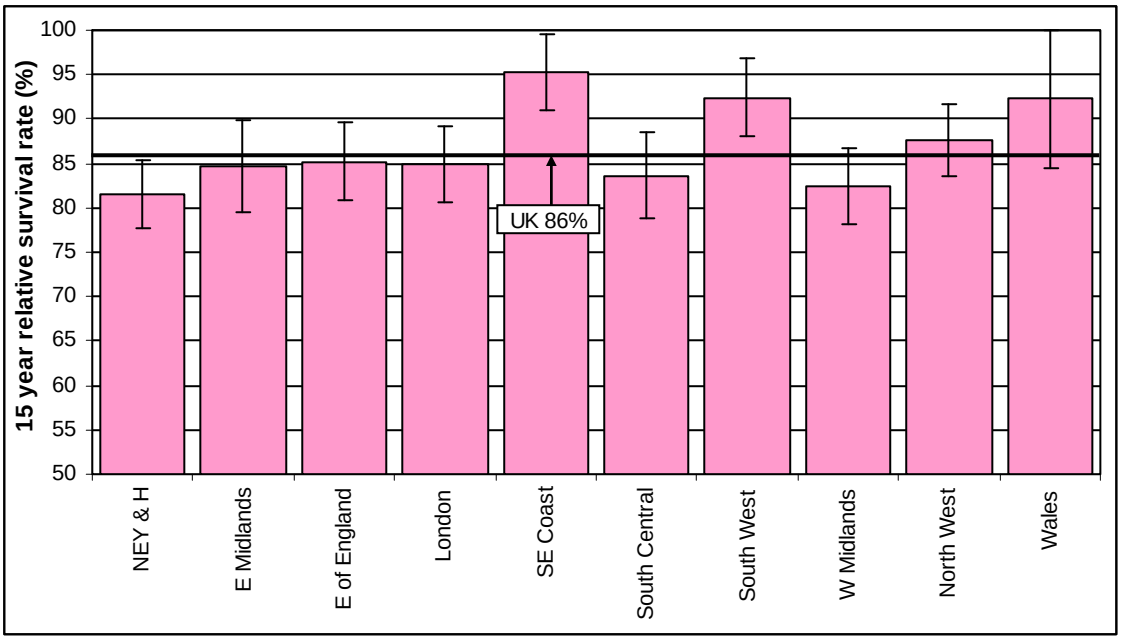

Figure 63 (Table 117): 15 year relative survival for women with screen detected invasive breast cancer diagnosed in 1990 and 1991

The following summary table shows the 5 year relative survival rate from past year's audit reports. Relative survival has improved significantly from 93.6% in 1990 and 1991 to 96.4% in 2000/01 and there is a increasing number of eligible cases in each year.

5 YEAR SURVIVAL RATE OF INVASIVE CANCERS INCLUDED IN THE AUDITS

Audit year	*Number of invasive cases*	*5 year survival rate*
Jan 1990 – Dec 1991	*7108 (2 years)*	*93.6 (92.9,94.4)*
Mar 1991 – Apr 1992	*No info*	
Mar 1992 – Apr 1993	*4864*	*92.5 (91.8,93.3)*
Mar 1993 – Apr 1994	*3705*	*93.9 (93.2,94.7)*
Mar 1994 – Apr 1995	*4554*	*93.1 (92.4,93.9)*
Mar 1995 – Apr 1996	*No info*	
Mar 1996 – Apr 1997	*5445*	*95.4 (94.6,96.2)*
Mar 1997 – Apr 1998	*5313*	*95.7 (94.9,96.5)*
Mar 1998 – Apr 1999	*6898*	*95.8 (95.1,96.5)*
Mar 1999 – Apr 2000	*6761*	*96.5 (95.8,97.2)*
Mar 2000 – Apr 2001	*7007*	*96.4 (95.8,97.1)*

9.5 Relative Survival with Tumour Characteristics

The following table shows the tumour characteristics of the cancers included in the 1990 and 1991 and 2000/01 survival audits. The data completeness of breast cancer data has improved greatly in these 10 years. In 1990 and 1991, the low completeness of invasive size, grade and nodal status data meant that the NPI score was unknown for 67% of invasive cancers, whereas the NPI score was unknown for only 11% of invasive cancers diagnosed in 2000/01.

Parameter		Cancers included in each analysis group			
		1990 and 1991 (2 years)		2000/01 (1 year)	
		No.	%	No.	%
Invasive status	Invasive	7,108	83	7,007	79
	Micro-invasive	208	2	119	1
	Non-invasive	1,249	15	1,688	19
Age group (invasive cancers only)	<50	60	1	137	2
	50-52	871	12	1,397	20
	53-55	1,066	15	1,131	16
	56-58	1,313	18	1,070	15
	59-61	1,644	23	1,114	16
	62-64	1,741	24	1,122	16
	65+	413	6	1,025	14
	Total	**7,108**	**100**	**7,007**	**100**
Invasive cancer size	<10mm	1,332	19	1,694	24
	10-<20mm	3,113	44	3,479	50
	20-<49mm	1,845	26	1,688	24
	50mm+	131	2	86	1
	Unknown	687	10	60	1
	Total	**7,108**	**100**	**7,007**	**100**
Invasive grade	Grade I	1,639	23	2,282	33
	Grade II	2,187	31	3,266	47
	Grade III	806	11	1,161	17
	Not assessable	420	6	105	1
	Unknown	2,056	29	193	3
	Total	**7,108**	**100**	**7,007**	**100**
Nodal status (invasive cancers only)	Negative	2,314	33	4,833	69
	Positive	1,115	16	1,643	23
	Unknown	3,679	52	531	8
	Total	**7,108**	**100**	**7,007**	**100**
NPI group (invasive cancers only)	EPG	529	7	1,602	23
	GPG	752	11	2,212	32
	MPG1	569	8	1,383	20
	MPG2	300	4	642	9
	PPG	176	2	388	6
	Unknown	4,782	67	780	11
	Total	**7,108**	**100**	**7,007**	**100**

9.5.1 Relative Survival with Invasive Status

The following table shows the 5, 10, and 15 year relative survival rates for invasive, micro-invasive and non-invasive cancers diagnosed in 1990 and 1991. For micro-invasive and non-invasive cancers, the upper 95% confidence limits cancers are higher than 100%. This indicates that their chance of survival is no worse than that of the UK female population as a whole. The 10 and 15 year survival rates for invasive cancers are 88.8% and 86.3% respectively.

EFFECT OF INVASIVE CANCER STATUS ON RELATIVE SURVIVAL			
	5 year	***10 year***	***15 year***
Invasive	*93.6 (92.9,94.4)*	*88.8 (87.6,89.9)*	*86.3 (84.9,87.8)*
Micro-invasive	*99.9 (97.0,102.9)*	*97.9 (92.8,103.1)*	*100.5 (93.6,107.4)*
Non-invasive	*100.9 (99.8,102)*	*100.8 (98.9,102.8)*	*102.1 (99.3,104.9)*

9.5.2 Relative Survival of Invasive Cancers with Age Group

Table 118 and Figure 64 show the variation with age at diagnosis in the 5, 10 and 15 year relative survival rates of women diagnosed with primary invasive cancer in 1990 and 1991 and in 2000/01. Although there is no statistical difference in the relative survival rates for women in the different age bands in the two cohorts, 5, 10 and 15 year relative survival rates were highest for women aged over 65. With the exception women aged 65 and over, 5 year survival rates for cancers diagnosed in 2000/01 were higher in all age groups than those for cancers diagnosed in 1990 and 1991. This difference was particularly marked in women aged less than 50 but, as these women formed less than 2% of each cohort, this variation should be treated with caution. 10 year and 15 year survival rates for cancers diagnosed in 1990 and 1991 were similar, varying between 83% and 91% in women aged 50-64. The 10 and 15 year relative survival rates for women aged less than 50 were lower at around 80%, compared with women aged 65 or over at around 97%.

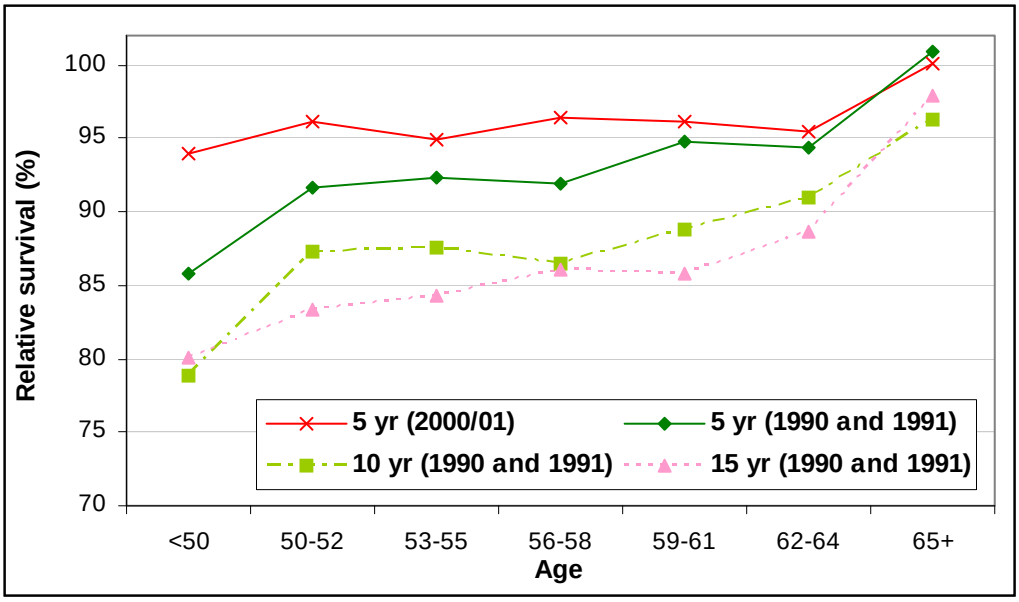

Figure 64 (Table 118): Variation in 5, 10 and 15 year relative survival with age for women with screen detected invasive breast cancer

The comparatively high relative survival of women aged 65 and over, is similar to that which has been seen in previous audits for non-invasive cancers diagnosed via screening and may be due to a number of factors. Firstly, it is possible that routine follow-up appointments result in the earlier identification of other health problems in women diagnosed with early stage breast cancer than in women of the same age in the general population. Secondly, women over 65 years of age who self-referred for breast screening may be from a more affluent socio-economic group and therefore have better survival than the general population as a whole. There is some evidence to support this hypothesis from screening history data available in the West Midlands which show that 47% of women aged 65 and over diagnosed with screen-detected breast cancer are in the two most affluent Townsend bands. These explanations could be tested using socio-economic status adjusted life tables and this will form part of an independent research project.

9.5.3 Relative Survival of Invasive Cancers with Tumour Size, Grade and Nodal Status

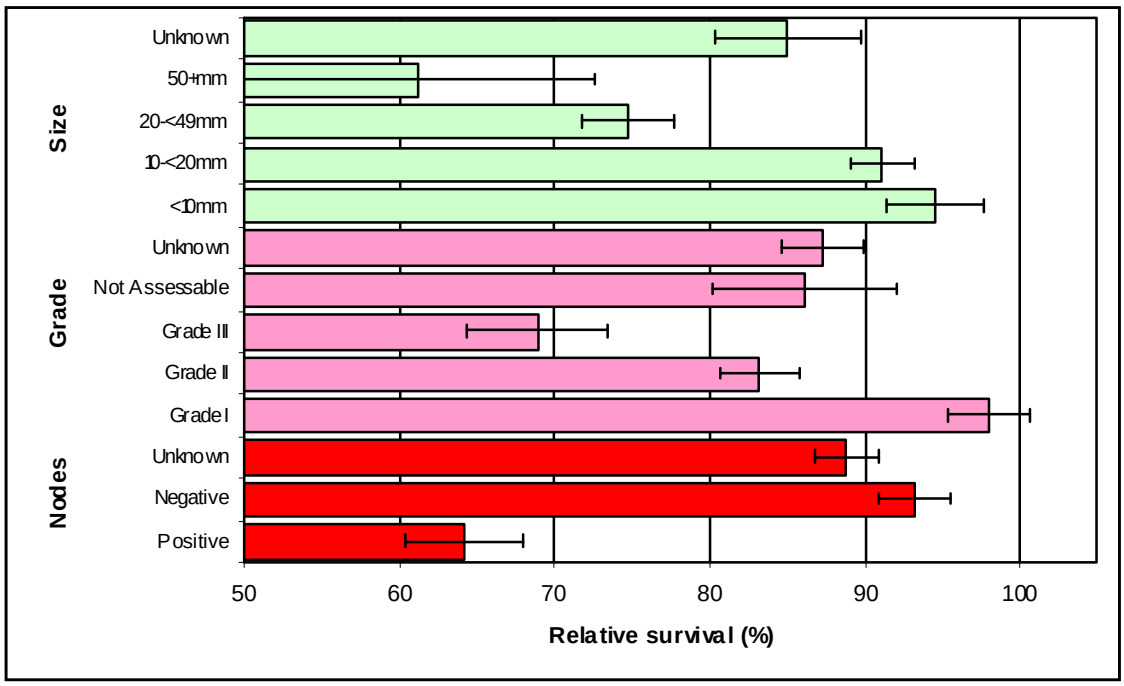

Figure 65 (Tables 119, 120 & 121): Variation in 15 year relative survival with nodal status, grade and size for women with screen detected invasive breast cancer

Figure 65 shows how 15 year relative survival rates vary with tumour size, grade and nodal status. The 15 year relative survival of women with less than 10mm diameter cancers was 94.6% (95% CI 91.5%-97.6%). The 15 year relative survival of women with cancers with diameter greater than 50mm was significantly lower at 85.0% (95% CI 80.4%-89.6%). The 15 year relative survival rate was also significantly lower for Grade III cancers (11% of the cohort) at 68.9% (95% CI 64.5%-73.4%) and for node positive cancers (16% of the cohort) at 64.2% (95% CI 60.4%-68.0%). The 15 year relative survival for node negative cancers was 93.2% (95% CI 90.9%-95.6%) and for Grade I cancers was 98.0% (95% CI 95.3%-100.6%).

9.5.4 Relative Survival of Invasive Cancers with NPI Group

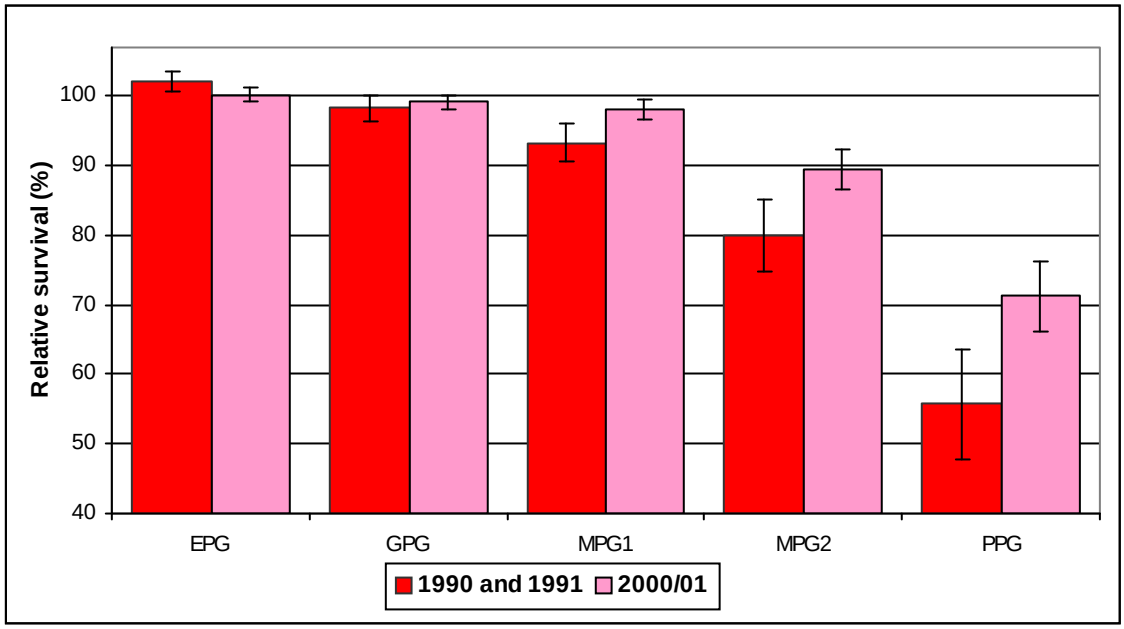

Figure 66 (Table 122): Variation in 5 year relative survival with NPI group for women with screen detected invasive breast cancer in 1990 and 1991 and 2000/01

The Nottingham Prognostic Index (NPI) is a combined score derived from the invasive size, grade and nodal status of an invasive cancer. Figure 66 shows that the 5 year survival rates in women who had invasive cancers detected in the excellent prognostic group (EPG) and the good prognostic group (GPG) are no worse than the survival rate of the general public. For these groups there has been no significant improvement between 1990 and 1991 and 2000/01. For moderate prognostic groups (MPG1 and MPG2) and the poor prognostic group (PPG), 5 year relative survival rates have improved significantly between 1990 and 1991 and 2000/01.

COMMENTS:

- Of the 9,064 cancers submitted to the survival analysis for the period 1 January 1990 to 31 December 1991, 4% were excluded because they were not registered at the cancer registries. A further 73 cancers were excluded because they were not confirmed to be primary tumours and 59 more because their invasive status was not known.
- The 5 year relative survival has improved significantly from 93.6% in 1990 and 1991 to 96.4% in 2000/01. The 15 year relative survival for invasive cancers diagnosed in 1990 and 1991 was 86.3% (95% CI 84.9%-87.8%).
- The 15 year relative survival of women with less than 10mm diameter invasive cancers was 94.6%. The 15 year relative survival of women with invasive cancers with diameter greater than 20mm was significantly lower.
- 15 year relative survival rates were also significantly lower for Grade III cancers at 68.9% and for node positive cancers at 64.2%. The 15 year relative survival rate for node negative cancers was 93.2% and for Grade I cancers was 98.0% (95% CI 95.3%-100.6%).
- The 5 year survival rates in women in 1990 and 1991 who had invasive cancers detected in the excellent prognostic group (EPG) and the good prognostic group (GPG) are no worse than the survival rate of the general public. For these groups there has been no significant improvement between 1990 and 1991 and 2000/01.
- For moderate prognostic groups (MPG1 and MPG2) and the poor prognostic group (PPG), 5 year relative survival rates have improved significantly between 1990 and 1991 and 2000/01.

APPENDIX A: TIMETABLE OF EVENTS

ABS AT BASO AUDIT OF SCREEN DETECTED BREAST CANCERS FOR THE YEAR OF SCREENING 1ST APRIL 2006 - 31ST MARCH 2007

AUDIT TIMETABLE	
Date	**Event**
24th May 07	Audit group meet to plan the 2006/07 audit.
5th June 07	Draft timetable and changes in the audit emailed to Audit Group, QA Reference Centres (QARCs) and Cancer Registries for comments. Email QA Reference Centres regarding the plan to run adjuvant and survival crystal reports.
5th – 13th June	QA Co-ordinators discuss draft timetable and changes with their QA Surgeon, QA Director and QA Data Managers. Return comments to the West Midlands Cancer Intelligence Unit (WMCIU) by 13th June.
22nd June 07	Audit documents sent to QA Surgeons, QA Directors and QA Co-ordinators. QA Co-ordinators liaise with lead surgeons, data managers and screening office managers on methods used to collect data. Survival and adjuvant audit data collection can begin immediately. Main audit data can be collected as soon as the screening office computer system is ready to provide a KC62 return for 2006/07.
30th June 07	QARCs/screening offices to run adjuvant and survival crystal report before the new clinical module is in place.
16th July 07	Deadline for QARCs to request survival audit data from Cancer Registries.
24th Aug 07	Deadline for Cancer Registries to provide data to the QARCs for the survival audit.
17th Sept 07	**All QARCs to ensure that an appropriate member of staff attends a data quality day at the NBSS Training Centre, Coventry to validate the completed audit spreadsheets.**
15th Oct 07	**Deadline for receipt of survival data from QARCs at the WMCIU.**
16th - 19th Oct 07	All QARCs to ensure that an appropriate member of staff is available to respond to any queries from the WMCIU regarding the survival audit.
12th Nov 07	Suggested deadline for main and adjuvant audit data to be provided to QARCs with the signature of the lead breast surgeon to confirm that the data are correct. *An earlier deadline may be set by the QARC due to local issues, eg. QA Team requirements.*
12th Nov 07– 4th Jan 08	QARCs validate audit data and collate into the main and adjuvant spreadsheets provided. QARCs ensure that all cases are coded correctly, that all internal data checks are resolved and that there are no anomalies in the data.
7th Jan 08	**Deadline for receipt of main and adjuvant audit data from QARCs at the WMCIU.**
8th – 18th Jan 08	All QARCs to ensure that an appropriate member of staff is available to respond to queries from the WMCIU. The WMCIU liaises with QARCs to ensure data are complete, correct and surgically confirmed. It will not be possible to incorporate new or late data after this stage.
27th Feb 08	First draft audit booklet emailed to Audit group for comments
14th Mar 08	Audit booklet tables emailed QA Reference Centres for information. *All draft data should be marked "Not for circulation" to avoid unpublished data getting into the public domain.*
4th April 08	Audit booklet final draft sent to the Audit Group to act as scrutinisers/editors.
14th May 08	Audit group and speakers pre-conference meeting
23rd April 08	Deadline for receipt of the audit booklet at the printers.
26th – 30th May 08	Advance copies of booklet to be sent to Audit Group and commentator of the BASO conference
11th June 08	**Audit booklet distributed at the 2008 ABS at BASO Conference, Motorcycle Museum Birmingham.**

APPENDIX B: BREAST AUDIT QUESTIONNAIRE WITH GUIDANCE NOTES

NHSBSP & ABS AT BASO AUDIT OF WOMEN WITH SCREEN DETECTED BREAST CANCERS DETECTED FOLLOWING INVITATION BETWEEN 1 APRIL 2006 AND 31 MARCH 2007

PLEASE SUPPLY DATA FOR WOMEN OF ALL AGES WITH SCREEN DETECTED BREAST CANCERS WITH FIRST OFFERED APPOINTMENT FROM 1ST APRIL 2006 - 31ST MARCH 2007 INCLUSIVE ACCORDING TO THE REGIONAL BOUNDARIES EXTANT FROM 1ST APRIL 2007

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

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 be sent to WMCIU in electric format using the spreadsheet with the check programme. Although there is an explanation column for special cases that contain errors in this spreadsheet, it is only for regional recording use and WMCIU does not need to know details of individual cases. However, we would ask for an indication that those cases were being checked. **All data sent to WMCIU should be password protected.**

The named unit data will be available in Excel format on the NHSBSP website. The 20 smallest screening units according to the number of women screened will be highlighted as agreed in the QA Directors meeting.

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.

The deadline for submission of regional data by the regional QA Co-ordinator to the WMCIU is 7 January 2008

****

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 NHSBSP & ABS at BASO breast audit should be counted in the same way so that the total number of cancers in this breast audit equals the total number of cancers counted on the KC62 report for 2006/07. If bilateral or multiple cancers have been detected, the KC62 software selects the worst prognosis cancer. The same rules should be applied for this audit. All data for bilateral cases should be taken from the cancer included in the KC62.

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. Enter the total number of such cancers in the preliminary data table.

Non-operative diagnosis for cancers: NHSBSP policy defines non-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 an outcome of cancer. These cancers appear in KC62 C24 L24, which includes some cancers with operations which were both diagnostic and therapeutic. If the diagnostic open biopsy was treatment, and was the only operation, then the total number of therapeutic operations is zero.

Cytology and Core biopsy: Codes used on the NHSBSP pathology reporting forms

If cytology was carried out please indicate the highest (worst) cytology result in the "worst cytology". If no cytology was carried out enter NONE. If core biopsy was carried out please indicate the highest (worst) core biopsy result in the "worst core biopsy" column. If no core biopsy was carried out enter NONE. If a B5 result was obtained but the malignancy type (B5A or B5B) is unknown or not assessable enter B5C in the "worst core biopsy" column. <u>The number of visits to an assessment clinic (excluding results clinics) in order to undergo core biopsy or cytology procedures should be recorded.</u>

Invasive status:
Invasive status at surgery: the worst invasive status at surgery/surgeries.
Final invasive status: this takes into account the non-operative diagnosis and the final decision of the MDT (in some cases).
For example, a case with B5b (Invasive) diagnosis but non-invasive at surgery will have 'N' in the invasive status at surgery column and 'I' in the final invasive status column. A case with the invasive component taken out at mammotome and benign at surgery will have 'B' in the invasive status at surgery column and 'I' (if MDT agree) in the final invasive status column. Note that a cancer with no surgery has the final invasive status taken from the core biopsy (B5A non-invasive, B5B invasive) and the invasive status at surgery would be 'U'.

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 surgical referral 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 2006/07. 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. For women undergoing mastectomy, the surgeon should indicate whether there was immediate reconstruction.

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

Type of operation/treatment: An operation is a visit to theatre, at which one or more procedures are intended to be carried out. For this audit, code each diagnostic or therapeutic operation to the primary tumour (up to a maximum of 5) according to whether conservation surgery or mastectomy was carried out, with or without an axillary procedure. Exclude reconstruction alone. Conservation surgery can be wide local excision, repeat excision, localisation biopsy etc. If a case had only 2 operations, code the 3rd, 4th and 5th operation as no surgery (NS).

Diagnostic and therapeutic operations: The number of operations will be calculated by the WMCIU. A woman with screen detected breast cancer who did not have a non-operative diagnosis (C5 or B5) must have had a diagnostic open biopsy to be included in this audit. All other operations (including axillary procedures), are considered to be therapeutic for this audit. 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.** The number of nodes obtained at each operation (visit to theatre) and the number of these which are found to be positive is requested. The number of nodes obtained will be 0 in many cases. In instances where an axillary procedure has been undertaken but no nodes obtained, the number of nodes obtained should be recorded as zero. It is recommended that these cases are reviewed by the QARC and the classification confirmed with the responsible surgeon. Incidental nodes may be obtained at operations where no axillary procedure is recorded. These should be recorded in the nodal columns but all such anomalies should be checked before submission. If a case had only 2 operations, code the nodal columns for the 3rd, 4th and 5th operation as no surgery (NS).

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

Micro-invasive cancer: Non-invasive cancer with possible micro-invasion should be included in Part A and Part C of the audit. Cancers which are definitely micro-invasive should only appear in Part A.

DATA CHECKS

The Regional QA co-ordinator should work with screening office managers on data quality issues. A number of data checks have been incorporated into the spreadsheet. Please consult the user guide for the data check programme. References to the KC62 Table T column and line numbers are given for information.

Case Check 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).

Caseload Check In the screening surgical caseload audit, the total number of cancers should equal the total caseload plus the total number of women with no surgical referral 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 regional QA Co-ordinator must ensure that all records are cleared of errors, except special cases with explanations.

Queries
Any queries about the NHSBSP and ABS at BASO audit should be directed to:

Ms Shan Cheung
Breast Screening 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
shan.cheung@wmciu.nhs.uk
breastqarc@wmciu.nhs.uk

ABS AT BASO BREAST AUDIT 2006/07

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 any sentinel procedure trial? (Y/N)	Number of clients in 2006/07 with C5 cytology but benign histology (ie. cytology false positive) (CQA report)	Number of clients in 2006/07 with B5 core biopsy but benign histology (ie. core biopsy false positive) (BQA report)

PART A1: TO BE COMPLETED FOR ALL CANCERS (KC62 C25 L36)

Col. D - GMC Code (enter GMC code of the consultant surgeon or NoRef=No consultant surgeon). If the woman was treated by more than one consultant surgeon enter all GMC codes, separated by **semicolons**. Cases with no surgery (NS) still usually are assigned to a consultant surgeon.
Dates - Enter dates in dd/mm/yyyy format. EC=Early Recall. U=Unknown
Col. N - Number of visit refers to FNA Date and Core Date in the crystal report. If biopsy/cyt performed on the same date, count as 1 visit.
Col. O - Type of treatment refer to the final concluded treatment type of all treatment involved (C=Conservation surgery, M=Mastectomy, NS=No surgery, U=Unknown)
Col. P - Immediate Reconstruction - to be completed by the surgeon for mastectomies only. Enter X if type of treatment not M.
Col. Q - Invasive status at surgery refers to the worst invasive status at surgery/surgeries. I = invasive, M = micro-invasive, N = non-invasive, B = benign histology, U = unknown/no information/no surgery.
Col. R- Invasive status of the cancer; taking into account the non-operative diagnosis, surgery and MDT decisions.

-Sx Number- *{C}* **Sx Number**	*-Surgeon-* *{G}* **Consultant GMC Code**	*-DOB-* *{H}* **Date of birth** *(dd/mm/yyyy*	*-DOFOA-* *{I}* **Date of first offered appt** *(dd/mm/yyyy)*	*-Screen Date-* *{J}* **Screen date** *(dd/mm/yyyy , EC,U)*	*-Ass Date-* *{K}* **First assessment date** *(dd/mm/yyyy, U)*	*-WBN Opinon-* *{L}* **Worst cytology** *(see above)*	*-WBN Opinion + Type-* *{M}* **Worst core biopsy** *(see above)*	*{N}* **Number of visits for cytology/core biopsy** *(exclude results clinic)* *(U,0,1,2,.)*	*{O}* **Type of treat-ment** *(C,M,NS,U)*	*-treatment-* *{P}* **Immediate recon-struction** *(only for M =Mastectomy)* *(Y,N,U,X)*	*{Q}* **Invasive status at surgery** *(I,M,N,B, U)*	*{R}* **Final Invasive status** *(I,M,N,U)*

PART A2: TO BE COMPLETED FOR ALL CANCERS (KC62 C25 L36)

For each operation (visit to theatre) – intended surgery, ignoring reconstruction, enter the most appropriate from the following list (C=Conservation surgery, M=Mastectomy, AX=Axillary procedure, C+AX, M+AX, NS=No surgery, U=Unknown)
Conservation surgery can be wide local excision (WLE), repeat excision, localisation biopsy etc
(e.g. a diagnostic open biopsy on one day followed at a later date by a mastectomy where axillary surgery was done. It should be coded 1st=C, 2nd=M+AX, 3rd=NS, 4th=NS, 5th=NS)

{C} **Sx Number**	*-Biopsy Date- {S}* **First surgery date** *(diag or therapeutic)* *(dd/mm/yyyy,NS,U)*	*-Biopsy Date- {T}* **Final surgery date** *(excl reconstruction only)* *(dd/mm/yyyy,NS,U)*	*-Treatment + No des- {U}* **First operation type** *(diag or therapeutic)* *(C,M,AX, C+AX,M+AX, NS,U)*	*-Treatment + No des- {V}* **Second operation type** *(C,M,AX, C+AX,M+AX, NS,U)*	*-Treatment + No des- {W}* **Third operation type** *(C,M,AX, C+AX,M+AX, NS,U)*	*-Treatment + No des- {X}* **Fourth operation type** *(C,M,AX, C+AX,M+AX, NS,U)*	*-Treatment + No des- {Y}* **Fifth operation type** *(C,M,AX, C+AX,M+AX, NS,U)*

PART A3: TO BE COMPLETED FOR ALL CANCERS (KC62 C25 L36)

Coding: NS, U, 0,1,2,…The number of nodes obtained at each operation (visit to theatre) is requested. This will be 0 in many cases, even if an axillary procedure is recorded as part of the operation type. Incidental nodes may be obtained at operations where no axillary procedure is recorded. These should be recorded in the nodal columns but all such anomalies should be checked and flagged before the spreadsheet is submitted.
If a case had only 2 operations, code the nodal columns for the 3rd, 4th and 5th operation as no surgery (NS).

Any sentinel procedure? (Y/N/U) Enter Y if any of the axillary procedures were sentinel procedures.

	1st operation (diagnostic or therapeutic)		**2nd operation**		**3rd operation**		**4th operation**		**5th operation**		
{C} **Sx Number**	*-Total Node- {Z}* **Total nodes obtained** *(NS,U, 0,1,2,..)*	*-Pos Nod- {AA}* **Number nodes positive** *(NS,U, 0,1,2,..)*	*-Total Node- {AB}* **Total nodes obtained** *(NS,U, 0,1,2,..)*	*-Pos Nod- {AC}* **Number nodes positive** *(NS,U, 0,1,2,..)*	*-Total Node- {AD}* **Total nodes obtained** *(NS,U, 0,1,2,..)*	*-Pos Nod- {AE}* **Number nodes positive** *(NS,U, 0,1,2,..)*	*-Total Node- {AF}* **Total nodes obtained** *(NS,U, 0,1,2,..)*	*-Pos Nod- {AG}* **Number nodes positive** *(NS,U, 0,1,2,..)*	*-Total Node- {AH}* **Total nodes obtained** *(NS,U, 0,1,2,..)*	*-Pos Nod- {AI}* **Number nodes positive** *(NS,U, 0,1,2,..)*	*{AJ}* **Any Sentinel Procedure** *(Y/N/U)*

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

Col. AM - Invasive size (enter size in millimetres, U = Unknown)
Col. AN - Whole size (enter size in millimetres, U = Unknown). Whole size includes any surrounding DCIS.
Col. AO - Invasive grade – Bloom & Richardson (I, II, III, NA=Not assessable or U=Unknown. Enter X if not invasive)

{C} **Sx Number**	*-Max Dia- {AM}* **Invasive size of tumour**	*-Whole Size- {AN}* **Whole size of tumour** *(including surrounding DCIS)*	***-Grade-*** *{AO}* **Invasive grade** (I,II,III, NA,U)

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

Col. AR - Grade (H = High grade, I = Intermediate grade, L = Low grade, NA = Not assessable, U = Unknown)
Col. AS - Pathological size (enter size in millimetres, NA = Not assessable, U = Unknown)

{C} **Sx Number**	*-Non Invasive-* *{AR}* **Grade** (H,I,L,NA,U)	*-Whole Size-* *{AS}* **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.
In rare cases where there is no surgeon, the GMC code for the case should be coded as “NoRef” in Part A, and counted on the top line.
Cases treated by more than one surgeon should be counted in each surgeon’s Shared Cases field. For example if Surgeon A & B shared 1 case, input ‘1’ in both fields of Surgeon A and B.

GMC Code	**Screening caseload (from Part A)**	**Shared Cases**	**If caseload <10 was this because: (write Y in the first applicable reason)**							
			Other breast caseload > 30 per year	**Joined NHSBSP 2006/07**	**Left NHSBSP 2006/07**	**Surgeon is a plastic surgeon**	**Surgeon operated in private practice**	**Surgeon from other region**	**No information available for surgeon**	**Other reason (text)**
NoRef										

NODAL ASSESSMENT PROCEDURE INFORMATION

BDO = Sentinel lymph node biopsy using blue dye only
IO = Sentinel lymph node biopsy using isotope only
IBD = Sentinel lymph node biopsy using Isotope and Blue dye
BDS = Blue dye guided 4 node sampling
O = Other nodal assessment procedure (e.g. sampling, clearance, other - please specify in Col P)
X = no axillary procedure performed

GMC Code	Sentinel lymph node procedure (BDO,IO,IBD,BDS,O,X)	Other nodal assessment procedure, Please specify

APPENDIX C: ADJUVANT THERAPY AUDIT DATA FORM WITH GUIDANCE NOTES

NHSBSP & ABS AT BASO ADJUVANT AUDIT FOR WOMEN WITH SCREEN DETECTED BREAST CANCERS DETECTED BETWEEN 1ST APRIL 2005 AND 31ST MARCH 2006

PLEASE SUPPLY DATA FOR WOMEN OF ALL AGES WITH SCREEN DETECTED BREAST CANCERS WITH FIRST OFFERED APPOINTMENT FROM 1ST APRIL 2005 TO 31ST MARCH 2006 INCLUSIVE ACCORDING TO THE REGIONAL BOUNDARIES EXTANT FROM 1ST APRIL 2007

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

The audit steering 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 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 7 January 2008

DEFINITIONS AND GUIDANCE NOTES

Audit cut-off date: If a woman has not received radiotherapy or chemotherapy or hormonal therapy before 31st March 2007 then it should be assumed for the purposes of this audit that she has not had this treatment. This cut off date allows at least 1 year follow up for all cases.

Bilateral and multiple cancers*:* The KC62 report only counts one cancer per woman. Cancers included in the NHSBSP & ABS at BASO breast audit should be counted in the same way so that the number of cancers in this audit equals the number counted on the KC62 report. If bilateral or multiple cancers have been detected the KC62 selects the worst prognosis 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.

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

MATCHING TO TUMOUR DATA

The 2005/06 screen detected cancers in each region need to be downloaded using the 2006 main audit crystal reports. The downloaded data needs to be matched with the main data submitted to the WMCIU last year to check for any extra cases. If there are any extra cases the main data for these needs to be provided so that the WMCIU can conduct a complete analysis on all the adjuvant cases provided.

Your spreadsheet should include all cases for which the date of first offered appointment is from 1 April 2005 to 31 March 2006. Cases with no data supplied should have 'NDS' on any column of the cases.

The WMCIU must be advised of any changes in the region or unit code assigned to each screening unit's cases.

DATA CHECKS

The following checks are included in the Excel spreadsheet

Checks 1-3 (Assessment to surgery)	If the number of days from assessment to first surgery, assessment to final surgery or first to final surgery cannot be calculated, #VALUE! will appear. For cases with only one surgery, first to final surgery (so first surgery equals final surgery) should display 0. All cases where the number of days is negative should be checked.
Check 4 (Assessment to radiotherapy)	If the number of days from assessment to radiotherapy cannot be calculated, #VALUE! will appear. If the number of days is negative, the date of radiotherapy has been entered as before the date of assessment. All such cases should be checked to confirm that the patient received radiotherapy for a previous cancer.
Data check summary	Minimum, maximum, averages and quartiles of the number of days in each data check are provided in the spreadsheet.

Queries

Any queries about the adjuvant audit should be directed to:

Ms Shan Cheung
Breast Screening 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
shan.cheung@wmciu.nhs.uk
qarc@wmciu.nhs.uk

BASO ADJUVANT THERAPY AUDIT - TO BE COMPLETED FOR ALL CANCERS WITH DATE OF FIRST OFFERED APPOINTMENT FROM 1ST APRIL 2005 TO 31ST MARCH 2006 INCLUSIVE

UNIT:

Enter dates in dd/mm/yyyy format (e.g. 28/04/2006)

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

ADJUVANT THERAPY AUDIT - TO BE COMPLETED FOR ALL CANCERS WITH DATE OF FIRST OFFERED APPOINTMENT FROM 1ST APRIL 2005 TO 31ST MARCH 2006 INCLUSIVE

Enter dates in dd/mm/yyyy format (e.g. 01/04/2002) or U=Unknown, NS=No surgery, NRT=No radiotherapy,
Chemotherapy. Hormonal therapy: Y = therapy given before 31/03/07, N = No therapy given before 31/03/07, U=Unknown
ER Status, PgR Status, Cerb-B2/HER-2 (P = Positive, N = Negative, U = Unknown) to be completed according to local definitions.
(Cerb-B2/Her-2+ if immunohistochemistry 3+ or FISH +)
Previous cancer? : Y if the patient has a previous cancer affecting adjuvant treatment decisions (eg. already on CT for another cancer)

	To aid data collection by the consultant surgeon. Do not send to WMCIU			*See above for coding – to be completed according to local definitions*						
{D} **Sx Number**	*{K}* **Name**	*{L}* **NHS Number**	*{M}* **Hospital Number**	*{N}* **RT start date** (dd/mm/yyyy, NRT,U)	*{O}* **CT** (Y,N,U)	*{P}* **HT** **(eg. Tamoxifen)** (Y,N,U)	*{Q}* **ER Status** *(P,N,U)*	*{R}* **PgR Status** *(P,N,U)*	*{S}* **Cerb-B2/ HER-2** *(P,N,U)*	*{T}* **Previous cancer?** *(Y)*

APPENDIX D: SURVIVAL AUDIT DATA COLLECTION SHEET WITH GUIDANCE NOTES

NHSBSP & ABS AT BASO SURVIVAL AUDIT FOR WOMEN WITH SCREEN DETECTED BREAST CANCERS DETECTED BETWEEN 1 JANUARY 1990 AND 31 DECEMBER 1991

The completed spreadsheets should be submitted by the Breast Screening QA Reference Centre to the WMCIU by 15 October 2007. Like last year, a confirmation is required to ensure that all potential recurrence cases (see Check 7) have been investigated.

Aim:

To combine NHS Breast Screening Programme (NHSBSP) data for women with breast cancers detected by screening between 1 January 1990 and 31 December 1991 with data recorded by regional cancer registries to enable analysis of breast cancer survival for a period of up to 15 years post-diagnosis. Where tumour size, grade and nodal status are available the survival profiles according to prognostic characteristics will be examined. The audit will continue to demonstrate effective information exchange between the NHSBSP and regional cancer registries.

Study population:

All women with breast cancers screened under NHSBSP between 1 January 1990 and 31 December 1991 should be included in the audit.

Core patient and tumour data should be extracted from screening service computer systems and matched with records held by regional cancer registries. Screen detected cancers matched to recurrences at the cancer registry should be included in the audit, but flagged by the cancer registry so that they can be excluded from the survival analysis.

Cancer registries should identify deaths in these women and confirm that death data are complete to 31 December 2006, or provide an alternative date to which survival can be calculated.

Data collection:

A MS Excel spreadsheet to record survival audit data has been designed by the West Midlands Cancer Intelligence Unit and provided to each breast screening quality assurance reference centre. QA reference centres should liaise with cancer registries to complete the audit spreadsheets:

A paper representation of the format used in the spreadsheets is provided and may be used as the basis for a data collection form. Crystal reports designed by Mrs Margot Wheaton may be used to collect data from screening offices that use the NBSS computer system.

Overall responsibility for regional data collection remains with the QA Co-ordinator.

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

For cases screen detected in 1990/91 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

DO NOT send these details to WMCIU

- Date of birth — (dd/mm/yyyy) necessary for age calculations
- Sx No. (Screening Office Number) — for checking data and matching queries
- Date of first surgery — (dd/mm/yyyy, NS, U) a proxy for date of diagnosis, to help match cases at the cancer registry and to identify possible recurrences.
- Invasive status — Invasive/Micro-Invasive/Non-Invasive/Unknown

For invasive cancers only (enter X if the case is not invasive):

- Tumour size — invasive size in mm, 'U' for unknown
- Tumour grade — Bloom & Richardson I, II, III, NA or 'U' for unknown
- Total number of lymph nodes — total number, 0 if no nodes obtained, 'U' if unknown
- Number of positive lymph nodes — total number, 0 if node negative, 'U' if unknown

The region, screening unit and cancer registry should be added to each case.

DATA TO BE COLLECTED FROM REGIONAL CANCER REGISTRIES

Regional cancer registries will be asked by the QA reference centers to match screen detected breast tumours detected by screening in 2000/01 with data held on the cancer registration systems using name, NHS number, address, post code, date of birth, and date of first surgery (as a proxy for date of diagnosis). Cancer registries have been asked to supply the date of diagnosis of the tumour with which they have matched the patient and tumour details provided by the QA reference centre. This is because we have discovered that, in previous years, it has not been apparent when screen detected cancers have been matched to recurrences rather than to primary breast tumours. Clearly this is very important when carrying out survival analyses as we aim to include only screen detected primary breast cancers and not recurrences. We have therefore provided a recurrence flag which should be used to indicate that the screen detected cancer was not the primary breast cancer.

QA reference centres have been asked to supply to cancer registries the date of first surgery recorded at the screening service. Comparison of this date with the date of diagnosis recorded at the cancer registry should enable recurrences and multiple primary tumours to be identified amongst the screen detected cancers. QA reference centres can also supply dates of first surgery recorded by screening services for breast cancers detected in earlier years; this would help to identify matches to multiple primaries and recurrences in these cases. Further details may be requested from QA reference centres if a breast cancer is registered from the death certificate alone. If a woman has more than one primary cancer, ensure that the cause of death field is accurately recorded, so that it clearly states the site of the tumour causing the death if this is known.

The following data items are required from the cancer registry for all breast tumours screen detected between 1 January 1990 and 31 December 1991.

- Registration number — the unique registration number for the breast tumour should be added.
- Not registered — For tumours not registered indicate NR in the appropriate column. Please note that this field refers to tumours, not patients
- Recurrence — Where the screening episode is recorded as a recurrence of a previous breast primary, enter the primary cancer registration number and indicate R in the appropriate column.
- Date of diagnosis — dd/mm/yyyy of the specific tumour (U if unknown)
- ICDM code — morphology code of the specific tumour e.g. 85003
- Date of death — dd/mm/yyyy of the patient (leave blank if no death)
- Cause of death code — (leave blank if no death) Please refer to the attached additional guidance notes for details of coding.

- Cause of death text — for all deaths the actual cause of death should be entered e.g. for a woman who died from pneumonia due to lung cancer (code 'C') the cause text should read 'lung'. For a woman who died from breast cancer metastases (code 'B') the text should read 'breast'.

The censor date for the audit has been set at **31 December 2006**. The cancer registry should confirm to the QA Reference Centre that death data are complete to **31 December 2006**, or provide an alternative date to which survival time can be calculated.

DATA VALIDATION

A number of data checks have been incorporated into the spreadsheet.

Check 1 (Age at Diagnosis) — If the age at diagnosis cannot be calculated, #VALUE! will appear. If the age at diagnosis is negative, the date of diagnosis has been entered as before the date of birth. All such cases should be checked.

Check 2 (Invasive Status) — If an invasive status has not been entered a prompt will appear in this column.

Check 3 (Survival Status) — The survival status is whether the woman was alive or dead at the end of the audit period. If the survival status cannot be calculated, #VALUE! will appear. All such cases should be checked.

Check 4 (Survival Time) — The survival time is the number of complete years from diagnosis to death or the end of the study period, whichever is earlier. If the survival time cannot be calculated, #VALUE! will appear. If the survival time is negative, the date of death has been entered as before the date of diagnosis. All such cases should be checked.

Check 5 (Nodal Status) — The nodal status is unknown if no axillary lymph nodes were obtained, or if it is unknown whether nodes were obtained. If the number of positive nodes is unknown, or greater than the number of nodes obtained, a prompt will appear. All such cases should be checked.

Check 6 (Invasive Size Band)	The invasive size, if known, is divided into 5 size bands. If the size is unknown for invasive cancer "U" will appear. All such cases should be checked.
Check 7 (Recurrence)	If the interval between Date of diagnosis and Date of 1st surgery is more than 6 months, a prompt will appear. All such cases should be checked to see if the screen detected cancer is a recurrence.

QUERIES

Any queries about the survival audit should be directed to:

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SURVIVAL AUDIT: SCREENING OFFICE DATA FOR CASES DETECTED IN 1990/91

Region:
Screening Unit:
Cancer Registry:

Date of first surgery (dd/mm/yyyy, NS = No surgery, U = Unknown)
Invasive status (I = Invasive, M = Micro-invasive, N = Non-invasive, U = Unknown)
Invasive Size (size in mm, U = unknown. Enter X if not invasive)
Tumour grade – Bloom & Richardson (I, II, III, NA = Not assessable or U = Unknown. Enter X if not invasive)
Total number of axillary nodes obtained (total number, zero if no nodes obtained, U = Unknown. Enter X if not invasive)
Number of positive axillary nodes (number positive, zero if node negative, U = Unknown. Enter X if not invasive)

DO NOT SEND DATA IN SHADED COLUMNS TO THE WMCIU

{C}	{D}	{E}	{F}	{G}	{H}	{I}	{J}	{K}	{L}	{M}	{N}	**Invasive Tumours only**			
Sx No.	**Fore-name**	**Sur-name**	**NHS Number**	**Address Line1**	**Address Line2**	**Address Line3**	**Address Line4**	**Post code**	**Date of birth** dd/mm/yyyy	**Date of first surgery** (dd/mm/yyyy, NS, U)	**Invasive Status** (I,M,N,U)	{O} **Invasive Size** (size (mm), U,X)	{P} **Tumour grade** (I,II,III, NA,U,X)	{Q} **Total nodes obtained** (0, 1, 2, ..,U,X)	{R} **Number positive nodes** (0, 1, 2, ..,U,X)

SURVIVAL AUDIT: CANCER REGISTRY DATA FOR CASES DETECTED IN 1990/91

Region:
Screening Unit:
Cancer Registry: **Data complete to: 31/12/2006 (amend if necessary)**

Cause of death code (B = Breast cancer, C = Other cancer (ie. other than the screen detected tumour), N = Non-cancer, U = Unknown, X = Not collected at cancer registry) e.g. a woman who died from lung cancer should be coded as 'C'. A woman who died from the screen detected breast cancer should be coded as 'B'.
Cause of death text - for all deaths, the actual cause of death should be entered e.g. for a woman who died from pneumonia due to lung cancer (code 'C') the cause text should read 'lung'. For a woman who died from breast cancer metastases (code 'B') the text should read 'breast'.

{C} **Sx No. (Screening Office Number)**	{T} **Cancer Registration Number**	{U} **Not Registered** (NR)	{V} **Recurrence** (R)	{W} **Date of diagnosis** (dd/mm/yyyy)	{X} **Date of death** (dd/mm/yyyy)	{Y} **ICDM code (morphology)**	{Z} **Cause of death code** (B, C, N, U, X)	{AA} **Cause of death text**

SURVIVAL AUDIT
(ADDITIONAL GUIDANCE)

Non-registered cases
The NHSBSP & ABS at BASO Survival audit is only concerned with details of women were screen detected with breast cancers in 1990/91. If when cases are matched, the diagnosis date recorded at the Cancer Registry is outside the audit period (1990/91), it may mean that the breast cancer the NHS BSP & ABS at BASO audit is examining is not registered (NR) at the Cancer Registry.

Remember- The NHSBSP & ABS at BASO Survival audit is only concerned with details of screen-detected primary breast cancers which were diagnosed between 1st January 1990 – 31st December 1991.

When matching cases, it is important that the breast cancer occurrence (the occurrence in 1990/91) is matched correctly not just the patient. For example:
A patient is recorded on the cancer registry database with another cancer (not necessarily a breast cancer), and so the patient themselves is registered. However, it may be that this patient was later diagnosed with a screen detected breast cancer in 1990/91 (as recorded at the breast screening unit) but when matched this actual breast cancer occurrence is not registered at the Cancer Registry for this patient. Although the patient is registered on the Cancer Registry database (for a previous cancer), the actual breast cancer occurrence in 1990/91 for that patient is not, so the case should be recorded as NR (not registered).

Recurrences
Cancer registries are asked to supply the date of diagnosis of the tumour with which they have matched the patient and tumour details provided by the QA reference centres (QARCs). This is because we have discovered that, in previous years, it has not been apparent when screen detected cancers have been matched to recurrences rather than to primary breast tumours. Clearly this is very important when carrying out survival analyses as we aim to include only screen detected primary breast cancers and not recurrences. We have therefore provided a recurrence flag which should be used to indicate that the screen detected cancer was not the primary breast cancer.

QARCs have been asked to supply to cancer registries the date of first surgery recorded at the screening service. Comparison of this date with the date of diagnosis recorded at the cancer registry should enable recurrences and multiple primary tumours to be identified amongst the screen detected cancers. If the interval between the date of diagnosis at the Cancer Registry and date of 1st surgery at the screening service is more than 6 months, these cases should be checked to see if the screen detected cancer is a recurrence.

ICDM codes (morphology)
ICDM codes should match the invasive status stated at the screening service for each case.

ICDM codes ending in 3 = Invasive cancers
ICDM codes ending in 2 = Non-invasive cancers
ICDM codes ending in 5 = Micro-invasive cancers

The reported ICDM code should be the worst prognostic component of the tumour. For example cancer registries may register multi-focal non-invasive and invasive components separately but only the worst component should be selected and reported (i.e. invasive).

Cause of death coding **(Version 1.3)**

Clarification of the rules for coding the cause of death from death certificates for submission to the NHSBSP & ABS at BASO audit of screen-detected breast cancers for patients who have been diagnosed with breast cancer.

B = death by breast cancer
Breast cancer appears in any section of part 1 of the death certificate (1a, 1b or 1c). There are certain exceptions to this rule (see below).

C = death by other cancer (not breast cancer)
One, or more, cancers of any site other than breast appear in any section of part 1 of the death certificate (1a, 1b or 1c). Breast cancer may appear in part 2 or not appear on the death certificate at all. There are certain exceptions to this rule (see below).

N = death by non-cancer cause
A non-cancer cause appears in any section of part 1 of the death certificate (1a, 1b or 1c). Breast cancer may appear in part 2 or not appear on the death certificate at all. There are certain exceptions to this rule (see below).

U = death by unknown cause
Two, or more, distinct cancers, one of which is breast cancer, appear in any section of part 1 of the death certificate (1a, 1b or 1c). i.e. cause of death is multiple independent primary sites so a single site cannot be assigned as the cause of death. If **two distinct breast cancers appear in any section of part 1 of the death certificate** (1a, 1b or 1c) record as B = death by breast cancer, as the breast cancer with the worst prognosis is the one used for the audit of screen detected breast cancer. There are several exceptions to this rule (see below).

X = death cause not collected

Exceptions covered by ICD-10 rules and guidelines for mortality and morbidity coding

B and C – If, in part 1 of the death certificate, all the sites are qualified as metastatic or appear on the list of common sites of metastases (see list below) and breast cancer is mentioned in part 2, and is not qualified as metastatic, then this should be recorded as B – death by breast cancer. The sites must all have the same morphology for this to be true. i.e. all carcinomas not a mixture of sarcoma and carcinoma or transitional cell carcinoma and breast cancer.

e.g. 1 (a) Metastatic carcinoma of stomach
(b) Metastatic carcinoma of lung
2 Carcinoma of breast
= B – death by breast cancer (because both stomach and lung are designated as metastases)

e.g. 1(a) Carcinoma of lung
(b) Carcinoma of liver
2 Carcinoma of breast
= B – death by breast cancer (because liver and lung are common sites for metastases)

e.g. 1(a) Peritoneal cancer
2 Breast cancer
= B – death by breast cancer (because peritoneum is a common site for metastases)

B – If breast cancer is not mentioned in part 1 or part 2 of the death certificate but carcinomatosis, or one of the sites which is on the list of common sites for metastases appears and there are no other cancers known of for the patient, then the cause of death should be recorded as
B – death by breast cancer.

e.g 1(a) Carcinomatosis
= B – death by breast cancer (if no other cancer known)

N – If, in part 1 of the death certificate (1a, 1b or 1c), the non-cancer cause of death is a direct consequence of the cancer of the breast (e.g. surgery), then the cause should be recorded as
B – death by breast cancer.

e.g. 1(a) mastectomy
2 Breast cancer
= B – death by breast cancer (because the mastectomy was performed for the breast cancer)

U – If, in part 1 of the death certificate (1a, 1b or 1c), all the cancers, other than the breast cancer, are qualified as metastatic or appear on the list of common sites of metastases (see list below), then the cause of death should be recorded as
B – death by breast cancer.

e.g. 1(a) Cancer of breast
(b) Cancer of liver
=B – death by breast cancer (because liver is on the list of common sites for metastases)

e.g. 1(a) Cancer of stomach
(b) Cancer of breast
= U – death by unknown cause (because neither of these are common sites for metastases)

e.g. 1(a) Metastatic carcinoma of breast
(b) Metastatic carcinoma of stomach
(c) Metastatic carcinoma of lung
= U – death by unknown cause (because neither breast nor stomach are common sites for metastases)

List of common sites of metastases for all cancers, including breast cancer

Bone
Brain
Diaphragm
Heart
Liver
Lung (bronchus and bronchogenic cancer is not included with the generic term of lung)
Lymph nodes
Ill defined sites (sites classifiable to C76)
Mediastinum
Meninges
Peritoneum
Pleura
Retroperitoneum
Spinal cord

CONTENTS
Tables in Appendix E, F & G

Main Audit (1 April 2006 to 31 March 2007)

Adjuvant audit (1 April 2005 to 31 March 2006)

Survival audit (1 January 1990 to 31 December 1991)

APPENDIX E: MAIN AUDIT DATA TABLES (1 - 69)

DATA FROM THE 2006/07 AUDIT OF SCREEN DETECTED BREAST CANCERS IN WOMEN ALL AGES FOR THE PERIOD 1 APRIL 2006 – 31 MARCH 2007

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	Micro/ Non-invasive cancer rate	Invasive cancer rate	Invasive <15mm rate
	No.	%	No.	%	No.	%	No.	%	No.	%				
N East, Yorks & Humber	1502	76	23	1	433	22	7	0	1965	100	243487	1.9	6.2	3.3
East Midlands	964	81	15	1	210	18	6	1	1195	100	144684	1.6	6.7	3.8
East of England	1241	77	14	1	347	22	0	0	1602	100	184260	2.0	6.7	3.5
London	1110	75	14	1	345	23	3	0	1472	100	201649	1.8	5.5	2.7
South East Coast	930	76	1	0	292	24	0	0	1223	100	153846	1.9	6.0	3.2
South Central	929	81	10	1	205	18	2	0	1146	100	140736	1.5	6.6	3.4
South West	1260	78	23	1	322	20	5	0	1610	100	193902	1.8	6.5	3.6
West Midlands	1117	80	11	1	271	19	0	0	1399	100	179241	1.6	6.2	3.2
North West	1429	81	27	2	310	18	2	0	1768	100	219317	1.5	6.5	3.3
Wales	661	80	4	0	160	19	0	0	825	100	95291	1.7	6.9	3.8
Northern Ireland	201	82	1	0	40	16	3	1	245	100	33111	1.2	6.1	2.8
Scotland	1147	82	9	1	250	18	0	0	1406	100	166301	1.6	6.9	3.7
United Kingdom	**12491**	**79**	**152**	**1**	**3185**	**20**	**28**	**0**	**15856**	**100**	**1955825**	**1.7**	**6.4**	**3.4**

Table 2 : Age at first offered appointment

Region	<50		50-64		65-70		71-75		76+		Total	>65	
	No.	%	No.	%	No.	%	No.	%	No.	%		No.	%
N East, Yorks & Humber	31	2	1327	68	504	26	75	4	28	1	1965	607	31
East Midlands	14	1	789	66	315	26	54	5	23	2	1195	392	33
East of England	11	1	1051	66	422	26	81	5	37	2	1602	540	34
London	29	2	988	67	382	26	49	3	24	2	1472	455	31
South East Coast	20	2	765	63	365	30	48	4	25	2	1223	438	36
South Central	21	2	726	63	320	28	54	5	25	2	1146	399	35
South West	25	2	1031	64	455	28	62	4	37	2	1610	554	34
West Midlands	24	2	941	67	367	26	45	3	22	2	1399	434	31
North West	25	1	1157	65	499	28	61	3	26	1	1768	586	33
Wales	16	2	500	61	246	30	47	6	16	2	825	309	37
Northern Ireland	0	0	230	94	8	3	7	3	0	0	245	15	6
Scotland	0	0	901	64	414	29	71	5	20	1	1406	505	36
United Kingdom	**216**	**1**	**10406**	**66**	**4297**	**27**	**654**	**4**	**283**	**2**	**15856**	**5234**	**33**

Table 3 : Cancers diagnosed on radiological/clinical grounds only

Region	Total cancers including radiological/clinical cancers	Cancers diagnosed on radiological/clinical grounds only	
		No.	%
N East, Yorks & Humber	1965	1	0.05
East Midlands	1195	1	0.08
East of England	1602	1	0.06
London	1472	1	0.07
South East Coast	1223	0	0.00
South Central	1146	1	0.09
South West	1610	1	0.06
West Midlands	1399	0	0.00
North West	1768	1	0.06
Wales	825	0	0.00
Northern Ireland	245	1	0.41
Scotland	1406	0	0.00
United Kingdom	**15856**	**8**	**0.05**

Table 4 : Non-operative diagnosis rate											
	Total cancers	C5 only		C5 & B5		B5 only		Non-operative diagnosis		No non-operative diagnosis	
Region		No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	1965	121	6	179	9	1587	81	1887	96	78	4
East Midlands	1195	6	1	25	2	1126	94	1157	97	38	3
East of England	1602	39	2	31	2	1414	88	1484	93	118	7
London	1472	35	2	60	4	1274	87	1369	93	103	7
South East Coast	1223	91	7	53	4	997	82	1141	93	82	7
South Central	1146	30	3	83	7	952	83	1065	93	81	7
South West	1610	68	4	48	3	1393	87	1509	94	101	6
West Midlands	1399	49	4	20	1	1268	91	1337	96	62	4
North West	1768	164	9	44	2	1452	82	1660	94	108	6
Wales	825	3	0	2	0	792	96	797	97	28	3
Northern Ireland	245	37	15	99	40	94	38	230	94	15	6
Scotland	1406	5	0	286	20	1041	74	1332	95	74	5
United Kingdom	**15856**	**648**	**4**	**930**	**6**	**13390**	**84**	**14968**	**94**	**888**	**6**

Table 5 : Non-operative diagnosis rate (invasive cancers)											
	Total cancers	C5 only		C5 & B5		B5 only		Non-operative diagnosis		No non-operative diagnosis	
Region		No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	1502	114	8	157	10	1211	81	1482	99	20	1
East Midlands	964	6	1	25	3	927	96	958	99	6	1
East of England	1241	38	3	30	2	1128	91	1196	96	45	4
London	1110	29	3	59	5	992	89	1080	97	30	3
South East Coast	930	91	10	53	6	761	82	905	97	25	3
South Central	929	28	3	81	9	791	85	900	97	29	3
South West	1260	62	5	45	4	1122	89	1229	98	31	2
West Midlands	1117	49	4	20	2	1029	92	1098	98	19	2
North West	1429	161	11	42	3	1187	83	1390	97	39	3
Wales	661	3	0	2	0	644	97	649	98	12	2
Northern Ireland	201	35	17	95	47	65	32	195	97	6	3
Scotland	1147	2	0	265	23	855	75	1122	98	25	2
United Kingdom	**12491**	**618**	**5**	**874**	**7**	**10712**	**86**	**12204**	**98**	**287**	**2**

Table 6 : Non-operative diagnosis rate (non-invasive cancers)											
	Total cancers	C5 only		C5 & B5		B5 only		Non-operative diagnosis		No non-operative diagnosis	
Region		No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	433	6	1	19	4	354	82	379	88	54	12
East Midlands	210	0	0	0	0	179	85	179	85	31	15
East of England	347	1	0	1	0	273	79	275	79	72	21
London	345	5	1	1	0	266	77	272	79	73	21
South East Coast	292	0	0	0	0	235	80	235	80	57	20
South Central	205	1	0	2	1	151	74	154	75	51	25
South West	322	2	1	1	0	250	78	253	79	69	21
West Midlands	271	0	0	0	0	229	85	229	85	42	15
North West	310	2	1	2	1	239	77	243	78	67	22
Wales	160	0	0	0	0	144	90	144	90	16	10
Northern Ireland	40	0	0	4	10	27	68	31	78	9	23
Scotland	250	3	1	19	8	179	72	201	80	49	20
United Kingdom	**3185**	**20**	**1**	**49**	**2**	**2526**	**79**	**2595**	**81**	**590**	**19**

Table 7 : Invasive status of the diagnostic core biopsy							
	Total	B5a (Non-invasive)		B5b (Invasive)		B5c (Not Assessable or Unknown)	
Region		No.	%	No.	%	No.	%
N East, Yorks & Humber	1766	460	26	1230	70	76	4
East Midlands	1151	246	21	895	78	10	1
East of England	1445	350	24	1090	75	5	0
London	1334	336	25	994	75	4	0
South East Coast	1050	298	28	750	71	2	0
South Central	1035	207	20	814	79	14	1
South West	1441	333	23	1082	75	26	2
West Midlands	1288	298	23	986	77	4	0
North West	1496	349	23	1143	76	4	0
Wales	794	198	25	594	75	2	0
Northern Ireland	193	43	22	140	73	10	5
Scotland	1327	265	20	1051	79	11	1
United Kingdom	**14320**	**3383**	**24**	**10769**	**75**	**168**	**1**

Table 8 : B5a (Non-invasive) core biopsy: histological status after surgery												
	Invasive		Micro-invasive		Non-invasive		Benign		Unknown		Total with surgery	
Region	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	96	21	17	4	338	74	2	0	1	0	454	100
East Midlands	54	22	14	6	166	69	8	3	0	0	242	100
East of England	65	19	13	4	263	76	6	2	0	0	347	100
London	55	17	14	4	249	75	14	4	0	0	332	100
South East Coast	62	21	1	0	233	79	0	0	0	0	296	100
South Central	52	25	9	4	144	70	1	0	0	0	206	100
South West	65	20	22	7	245	74	0	0	0	0	332	100
West Midlands	62	21	9	3	219	74	4	1	0	0	294	100
North West	84	24	19	6	240	70	2	1	0	0	345	100
Wales	51	26	4	2	137	70	5	3	0	0	197	100
Northern Ireland	12	29	1	2	29	69	0	0	0	0	42	100
Scotland	63	24	8	3	193	73	0	0	0	0	264	100
United Kingdom	**721**	**22**	**131**	**4**	**2456**	**73**	**42**	**1**	**1**	**0**	**3351**	**100**

Table 9 : B5b (Invasive) core biopsy: histological status after surgery												
	Invasive		Micro-invasive		Non-invasive		Benign		Unknown		Total with surgery	
Region	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	1179	99	3	0	11	1	2	0	1	0	1196	100
East Midlands	858	99	3	0	4	0	2	0	0	0	867	100
East of England	1053	99	0	0	5	0	3	0	1	0	1062	100
London	956	99	4	0	1	0	4	0	1	0	966	100
South East Coast	739	99	0	0	4	1	0	0	0	0	743	100
South Central	807	100	0	0	2	0	1	0	0	0	810	100
South West	1060	99	1	0	6	1	0	0	0	0	1067	100
West Midlands	961	99	2	0	5	1	1	0	0	0	969	100
North West	1127	100	1	0	3	0	0	0	0	0	1131	100
Wales	574	98	2	0	5	1	2	0	0	0	583	100
Northern Ireland	139	100	0	0	0	0	0	0	0	0	139	100
Scotland	1031	100	0	0	5	0	0	0	0	0	1036	100
United Kingdom	**10484**	**99**	**16**	**0**	**51**	**0**	**15**	**0**	**3**	**0**	**10569**	**100**

Table 10 :C5 only: histological status after surgery												
	Invasive		Micro-invasive		Non-invasive		Benign		Unknown		Total with surgery	
Region	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	114	94	0	0	6	5	1	1	0	0	121	100
East Midlands	6	100	0	0	0	0	0	0	0	0	6	100
East of England	38	97	0	0	1	3	0	0	0	0	39	100
London	29	85	0	0	5	15	0	0	0	0	34	100
South East Coast	91	100	0	0	0	0	0	0	0	0	91	100
South Central	28	97	0	0	1	3	0	0	0	0	29	100
South West	62	95	0	0	2	3	0	0	1	2	65	100
West Midlands	49	100	0	0	0	0	0	0	0	0	49	100
North West	161	99	0	0	2	1	0	0	0	0	163	100
Wales	3	100	0	0	0	0	0	0	0	0	3	100
Northern Ireland	35	97	0	0	0	0	1	3	0	0	36	100
Scotland	2	40	0	0	3	60	0	0	0	0	5	100
United Kingdom	**618**	**96**	**0**	**0**	**20**	**3**	**2**	**0**	**1**	**0**	**641**	**100**

Table 11 : Number of visits for cytology/core biopsy for all cancers														
	0		1		2		3+		Unknown		Total		Repeat (2+) visit for core/cyt	
Region	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	3	0	1752	89	200	10	10	1	0	0	1965	100	210	11
East Midlands	0	0	1103	92	88	7	4	0	0	0	1195	100	92	8
East of England	7	0	1503	94	92	6	0	0	0	0	1602	100	92	6
London	2	0	1345	91	121	8	4	0	0	0	1472	100	125	8
South East Coast	6	0	962	79	247	20	8	1	0	0	1223	100	255	21
South Central	3	0	1018	89	119	10	6	1	0	0	1146	100	125	11
South West	2	0	1401	87	197	12	10	1	0	0	1610	100	207	13
West Midlands	0	0	1270	91	122	9	7	1	0	0	1399	100	129	9
North West	1	0	1505	85	246	14	16	1	0	0	1768	100	262	15
Wales	0	0	754	91	69	8	2	0	0	0	825	100	71	9
Northern Ireland	0	0	220	90	24	10	1	0	0	0	245	100	25	10
Scotland	0	0	1318	94	83	6	5	0	0	0	1406	100	88	6
United Kingdom	**24**	**0**	**14151**	**89**	**1608**	**10**	**73**	**0**	**0**	**0**	**15856**	**100**	**1681**	**11**

Table 12 : All cancers versus C5 and/or B5 at first visit						
	1 visit with C5/B5 diagnosis		Non-operative diagnosis rate		All cancers	
Region	No.	%	No.	%	No.	%
N East, Yorks & Humber	1702	87	1887	96	1965	100
East Midlands	1073	90	1157	97	1195	100
East of England	1406	88	1484	93	1602	100
London	1255	85	1369	93	1472	100
South East Coast	906	74	1141	93	1223	100
South Central	957	84	1065	93	1146	100
South West	1324	82	1509	94	1610	100
West Midlands	1225	88	1337	96	1399	100
North West	1434	81	1660	94	1768	100
Wales	734	89	797	97	825	100
Northern Ireland	209	85	230	94	245	100
Scotland	1261	90	1332	95	1406	100
United Kingdom	**13486**	**85**	**14968**	**94**	**15856**	**100**

Table 13 : Status of diagnostic open biopsies									
	Benign		Malignant		Total		Total women screened	Benign biopsy rate	Malignant biopsy rate
Region	No.	%	No.	%	No.	%			
N East, Yorks & Humber	177	69	78	31	255	100	243487	0.73	0.32
East Midlands	96	72	38	28	134	100	144684	0.66	0.26
East of England	226	66	118	34	344	100	184260	1.23	0.64
London	222	68	103	32	325	100	201649	1.10	0.51
South East Coast	174	68	82	32	256	100	153846	1.13	0.53
South Central	128	61	81	39	209	100	140736	0.91	0.58
South West	212	68	101	32	313	100	193902	1.09	0.52
West Midlands	109	64	62	36	171	100	179241	0.61	0.35
North West	231	68	108	32	339	100	219317	1.05	0.49
Wales	70	71	28	29	98	100	95291	0.73	0.29
Northern Ireland	21	58	15	42	36	100	33111	0.63	0.45
Scotland	145	66	74	34	219	100	166301	0.87	0.44
United Kingdom	**1811**	**67**	**888**	**33**	**2699**	**100**	**1955825**	**0.93**	**0.45**

Table 14 : Number of clients with proven false positive C5 or B5 non-operative diagnosis				
	False positive C5 (CQA Report)		False positive B5 (BQA Report)	
Region	No.	Per 100,000 screened	No.	Per 100,000 screened
N East, Yorks & Humber	0	0.00	1	0.41
East Midlands	0	0.00	0	0.00
East of England	0	0.00	0	0.00
London	0	0.00	4	1.98
South East Coast	0	0.00	2	1.30
South Central	0	0.00	4	2.84
South West	2	1.03	4	2.06
West Midlands	0	0.00	0	0.00
North West	1	0.46	6	2.74
Wales	0	0.00	0	0.00
Northern Ireland	1	3.02	1	3.02
Scotland	0	0.00	0	0.00
United Kingdom	**4**	**0.20**	**22**	**1.12**

Table 15 : Invasive status of malignant diagnostic open biopsies									
	Total malignant open biopsies	Invasive		Micro-invasive		Non-invasive		Status unknown	
Region		No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	78	20	26	4	5	54	69	0	0
East Midlands	38	6	16	1	3	31	82	0	0
East of England	118	45	38	1	1	72	61	0	0
London	103	30	29	0	0	73	71	0	0
South East Coast	82	25	30	0	0	57	70	0	0
South Central	81	29	36	1	1	51	63	0	0
South West	101	31	31	1	1	69	68	0	0
West Midlands	62	19	31	1	2	42	68	0	0
North West	108	39	36	2	2	67	62	0	0
Wales	28	12	43	0	0	16	57	0	0
Northern Ireland	15	6	40	0	0	9	60	0	0
Scotland	74	25	34	0	0	49	66	0	0
United Kingdom	**888**	**287**	**32**	**11**	**1**	**590**	**66**	**0**	**0**

Table 16 : Non-operative history for invasive cancers with malignant open biopsy									
	Total malignant open biopsies	No non-operative procedures		Cytology only		Core biopsy only		Both cytology and core biopsy	
Region		No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	20	2	10	0	0	13	65	5	25
East Midlands	6	0	0	0	0	6	100	0	0
East of England	45	5	11	2	4	34	76	4	9
London	30	1	3	3	10	20	67	6	20
South East Coast	25	3	12	6	24	16	64	0	0
South Central	29	0	0	4	14	24	83	1	3
South West	31	2	6	6	19	18	58	5	16
West Midlands	19	0	0	2	11	15	79	2	11
North West	39	0	0	3	8	32	82	4	10
Wales	12	0	0	1	8	10	83	1	8
Northern Ireland	6	0	0	2	33	3	50	1	17
Scotland	25	0	0	1	4	19	76	5	20
United Kingdom	**287**	**13**	**5**	**30**	**10**	**210**	**73**	**34**	**12**

Table 17 : Non-operative history for non-invasive cancers with malignant open biopsy									
	Total malignant open biopsies	No non-operative procedures		Cytology only		Core biopsy only		Both cytology and core biopsy	
Region		No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	54	1	2	1	2	41	76	11	20
East Midlands	31	0	0	0	0	30	97	1	3
East of England	72	2	3	1	1	65	90	4	6
London	73	1	1	2	3	68	93	2	3
South East Coast	57	3	5	2	4	47	82	5	9
South Central	51	3	6	0	0	46	90	2	4
South West	69	0	0	1	1	63	91	5	7
West Midlands	42	0	0	0	0	41	98	1	2
North West	67	1	1	1	1	58	87	7	10
Wales	16	0	0	0	0	15	94	1	6
Northern Ireland	9	0	0	0	0	4	44	5	56
Scotland	49	0	0	0	0	41	84	8	16
United Kingdom	**590**	**11**	**2**	**8**	**1**	**519**	**88**	**52**	**9**

Table 18 : Highest cytology and core biopsy score prior to malignant diagnostic open biopsies (invasive cancers)											
	Total malignant open biopsies	No non-operative procedures		C4, B4 or both		C3, B3 or both		C2, B2 or both		C1, B1 or both	
Region		No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	20	2	10	8	40	10	50	0	0	0	0
East Midlands	6	0	0	4	67	2	33	0	0	0	0
East of England	45	5	11	23	51	13	29	0	0	4	9
London	30	1	3	7	23	15	50	6	20	1	3
South East Coast	25	3	12	8	32	8	32	2	8	4	16
South Central	29	0	0	8	28	18	62	1	3	2	7
South West	31	2	6	15	48	10	32	2	6	2	6
West Midlands	19	0	0	8	42	5	26	2	11	4	21
North West	39	0	0	18	46	16	41	1	3	4	10
Wales	12	0	0	4	33	5	42	0	0	3	25
Northern Ireland	6	0	0	2	33	3	50	1	17	0	0
Scotland	25	0	0	7	28	10	40	3	12	5	20
United Kingdom	**287**	**13**	**5**	**112**	**39**	**115**	**40**	**18**	**6**	**29**	**10**

Table 19 : Highest cytology and core biopsy score prior to malignant diagnostic open biopsies (non-invasive)											
	Total malignant open biopsies	No non-operative procedures		C4, B4 or both		C3, B3 or both		C2, B2 or both		C1, B1 or both	
Region		No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	54	1	2	17	31	36	67	0	0	0	0
East Midlands	31	0	0	13	42	17	55	1	3	0	0
East of England	72	2	3	29	40	35	49	3	4	3	4
London	73	1	1	15	21	52	71	4	5	1	1
South East Coast	57	3	5	19	33	35	61	0	0	0	0
South Central	51	3	6	24	47	19	37	2	4	3	6
South West	69	0	0	28	41	34	49	3	4	4	6
West Midlands	42	0	0	14	33	24	57	3	7	1	2
North West	67	1	1	24	36	32	48	5	7	5	7
Wales	16	0	0	5	31	9	56	1	6	1	6
Northern Ireland	9	0	0	5	56	3	33	1	11	0	0
Scotland	49	0	0	19	39	26	53	2	4	2	4
United Kingdom	**590**	**11**	**2**	**212**	**36**	**322**	**55**	**25**	**4**	**20**	**3**

Table 20 : Treatment for non-invasive and micro-invasive breast cancers										
	Conservation surgery		Mastectomy		No surgery		Unknown		Total	
Region	No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	300	66	150	33	6	1	0	0	456	100
East Midlands	140	62	81	36	4	2	0	0	225	100
East of England	261	72	97	27	3	1	0	0	361	100
London	258	72	98	27	2	1	1	0	359	100
South East Coast	213	73	78	27	2	1	0	0	293	100
South Central	159	74	55	26	1	0	0	0	215	100
South West	249	72	95	28	1	0	0	0	345	100
West Midlands	192	68	86	30	4	1	0	0	282	100
North West	235	70	98	29	4	1	0	0	337	100
Wales	118	72	45	27	1	1	0	0	164	100
Northern Ireland	30	73	10	24	1	2	0	0	41	100
Scotland	177	68	81	31	1	0	0	0	259	100
United Kingdom	**2332**	**70**	**974**	**29**	**30**	**1**	**1**	**0**	**3337**	**100**

Table 21 : Cytonuclear grade of surgically treated non-invasive cancers												
	High		Intermediate		Low		Not assessable		Unknown		Total with surgery	
Region	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	251	59	111	26	40	9	22	5	3	1	427	100
East Midlands	128	62	49	24	18	9	3	1	8	4	206	100
East of England	183	53	102	30	36	10	17	5	6	2	344	100
London	209	61	59	17	37	11	15	4	23	7	343	100
South East Coast	171	59	77	27	30	10	12	4	0	0	290	100
South Central	113	55	57	28	23	11	7	3	4	2	204	100
South West	179	56	76	24	40	12	25	8	1	0	321	100
West Midlands	169	63	60	22	26	10	8	3	4	1	267	100
North West	172	56	93	30	28	9	8	3	5	2	306	100
Wales	94	59	33	21	24	15	7	4	1	1	159	100
Northern Ireland	24	62	9	23	5	13	0	0	1	3	39	100
Scotland	164	66	60	24	13	5	6	2	6	2	249	100
United Kingdom	**1857**	**59**	**786**	**25**	**320**	**10**	**130**	**4**	**62**	**2**	**3155**	**100**

Table 22 : Size of non-invasive cancers												
	<15mm		15-<40mm		40+ mm		Size not assessable		Size unknown		Total non-invasive	
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
N East, Yorks & Humber	148	34	165	38	74	17	22	5	24	6	433	100
East Midlands	89	42	75	36	30	14	4	2	12	6	210	100
East of England	155	45	121	35	34	10	19	5	18	5	347	100
London	132	38	116	34	41	12	11	3	45	13	345	100
South East Coast	121	41	104	36	38	13	7	2	22	8	292	100
South Central	100	49	68	33	25	12	4	2	8	4	205	100
South West	146	45	94	29	46	14	0	0	36	11	322	100
West Midlands	102	38	102	38	47	17	7	3	13	5	271	100
North West	140	45	106	34	38	12	8	3	18	6	310	100
Wales	63	39	54	34	17	11	8	5	18	11	160	100
Northern Ireland	15	38	16	40	5	13	0	0	4	10	40	100
Scotland	102	41	98	39	39	16	4	2	7	3	250	100
United Kingdom	**1313**	**41**	**1119**	**35**	**434**	**14**	**94**	**3**	**225**	**7**	**3185**	**100**

Table 23: Data completeness for non-invasive cancers (with surgery only)							
	Unknown cytonuclear grade		Unknown size		Unknown cytonuclear grade and/or size		Total
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**
N East, Yorks & Humber	3	1	18	4	19	4	427
East Midlands	8	4	8	4	8	4	206
East of England	6	2	15	4	18	5	344
London	23	7	43	13	47	14	343
South East Coast	0	0	20	7	20	7	290
South Central	4	2	7	3	7	3	204
South West	1	0	35	11	35	11	321
West Midlands	4	1	9	3	10	4	267
North West	5	2	14	5	15	5	306
Wales	1	1	17	11	17	11	159
Northern Ireland	1	3	3	8	3	8	39
Scotland	6	2	6	2	9	4	249
United Kingdom	**62**	**2**	**195**	**6**	**208**	**7**	**3155**

Table 24 : Treatment of non-invasive cases with high cytonuclear grade and unknown size (benign surgery cases excluded)								
	Conservation surgery		Mastectomy		Unknown		Total	
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
N East, Yorks & Humber	5	45	6	55	0	0	11	100
East Midlands	0	-	0	-	0	-	0	-
East of England	2	100	0	0	0	0	2	100
London	4	33	8	67	0	0	12	100
South East Coast	3	50	3	50	0	0	6	100
South Central	1	50	1	50	0	0	2	100
South West	6	46	7	54	0	0	13	100
West Midlands	0	0	1	100	0	0	1	100
North West	1	33	2	67	0	0	3	100
Wales	3	50	3	50	0	0	6	100
Northern Ireland	1	100	0	0	0	0	1	100
Scotland	0	0	2	100	0	0	2	100
United Kingdom	**26**	**44**	**33**	**56**	**0**	**0**	**59**	**100**

Table 25 : Treatment of non-invasive cancers with unknown cytonuclear grade and unknown size (benign surgery cases excluded)										
	Conservation surgery		Mastectomy		Unknown treatment		No surgery		Total	
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
N East, Yorks & Humber	0	0	0	0	0	0	6	100	6	100
East Midlands	0	0	0	0	0	0	4	100	4	100
East of England	3	50	0	0	0	0	3	50	6	100
London	11	79	0	0	1	7	2	14	14	100
South East Coast	0	0	0	0	0	0	2	100	2	100
South Central	3	75	0	0	0	0	1	25	4	100
South West	0	0	1	50	0	0	1	50	2	100
West Midlands	1	20	0	0	0	0	4	80	5	100
North West	3	38	1	13	0	0	4	50	8	100
Wales	0	0	0	0	0	0	1	100	1	100
Northern Ireland	1	50	0	0	0	0	1	50	2	100
Scotland	2	50	1	25	0	0	1	25	4	100
United Kingdom	**24**	**41**	**3**	**5**	**1**	**2**	**30**	**52**	**58**	**100**

Table 26 : Treatment of high cytonuclear grade non-invasive cancers (40+mm)								
	Conservation surgery		Mastectomy		Unknown		Total	
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
N East, Yorks & Humber	6	11	51	89	0	0	57	100
East Midlands	6	25	18	75	0	0	24	100
East of England	2	7	25	93	0	0	27	100
London	6	20	24	80	0	0	30	100
South East Coast	5	17	25	83	0	0	30	100
South Central	4	22	14	78	0	0	18	100
South West	9	26	26	74	0	0	35	100
West Midlands	8	21	30	79	0	0	38	100
North West	5	21	19	79	0	0	24	100
Wales	3	21	11	79	0	0	14	100
Northern Ireland	3	60	2	40	0	0	5	100
Scotland	2	6	30	94	0	0	32	100
United Kingdom	**59**	**18**	**275**	**82**	**0**	**0**	**334**	**100**

Table 27 : Treatment for invasive breast cancers										
	Conservation surgery		Mastectomy		Unknown		No Surgery		Total	
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
N East, Yorks & Humber	1020	68	448	30	10	1	24	2	1502	100
East Midlands	636	66	300	31	0	0	28	3	964	100
East of England	882	71	331	27	0	0	28	2	1241	100
London	813	73	269	24	9	1	19	2	1110	100
South East Coast	710	76	213	23	0	0	7	1	930	100
South Central	713	77	212	23	0	0	4	0	929	100
South West	972	77	273	22	0	0	15	1	1260	100
West Midlands	837	75	263	24	0	0	17	2	1117	100
North West	1006	70	411	29	0	0	12	1	1429	100
Wales	466	70	184	28	0	0	11	2	661	100
Northern Ireland	137	68	63	31	0	0	1	0	201	100
Scotland	816	71	316	28	2	0	13	1	1147	100
United Kingdom	**9008**	**72**	**3283**	**26**	**21**	**0**	**179**	**1**	**12491**	100

Table 28 : Invasive size of invasive breast cancers														
	<10mm		10-<15mm		15-<20mm		20-<50mm		50+mm		Unknown		Total	
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
N East, Yorks & Humber	391	26	413	27	280	19	341	23	22	1	55	4	1502	100
East Midlands	263	27	289	30	177	18	185	19	12	1	38	4	964	100
East of England	315	25	322	26	238	19	299	24	20	2	47	4	1241	100
London	251	23	284	26	213	19	304	27	18	2	40	4	1110	100
South East Coast	224	24	264	28	195	21	222	24	12	1	13	1	930	100
South Central	223	24	257	28	176	19	244	26	18	2	11	1	929	100
South West	308	24	394	31	239	19	270	21	19	2	30	2	1260	100
West Midlands	254	23	315	28	216	19	270	24	37	3	25	2	1117	100
North West	356	25	376	26	264	18	363	25	44	3	26	2	1429	100
Wales	182	28	179	27	118	18	152	23	7	1	23	3	661	100
Northern Ireland	46	23	48	24	41	20	58	29	4	2	4	2	201	100
Scotland	263	23	350	31	226	20	262	23	21	2	25	2	1147	100
United Kingdom	**3076**	**25**	**3491**	**28**	**2383**	**19**	**2970**	**24**	**234**	**2**	**337**	**3**	**12491**	**100**

Table 29 : Mastectomy rate with invasive tumour size								
	<15mm		15-<20mm		20-<50mm		50+mm	
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
N East, Yorks & Humber	179	22	69	25	173	51	19	86
East Midlands	130	24	56	32	99	54	12	100
East of England	115	18	68	29	125	42	17	85
London	97	18	40	19	116	38	15	83
South East Coast	82	17	37	19	79	36	12	100
South Central	67	14	35	20	97	40	12	67
South West	95	14	63	26	94	35	15	79
West Midlands	93	16	42	19	93	34	32	86
North West	139	19	66	25	161	44	36	82
Wales	77	21	35	30	65	43	5	71
Northern Ireland	21	22	14	34	26	45	1	25
Scotland	113	18	46	20	135	52	19	90
United Kingdom	**1208**	**18**	**571**	**24**	**1263**	**43**	**195**	**83**

Table 30 : 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.**	**%**
N East, Yorks & Humber	222	15	330	22	307	20	514	34	86	6	43	3	1502	100
East Midlands	163	17	244	25	201	21	287	30	38	4	31	3	964	100
East of England	199	16	280	23	267	22	408	33	38	3	49	4	1241	100
London	146	13	226	20	203	18	385	35	50	5	100	9	1110	100
South East Coast	133	14	232	25	196	21	327	35	32	3	10	1	930	100
South Central	160	17	202	22	185	20	316	34	43	5	23	2	929	100
South West	195	15	354	28	245	19	404	32	41	3	21	2	1260	100
West Midlands	155	14	268	24	222	20	385	34	60	5	27	2	1117	100
North West	247	17	339	24	300	21	444	31	72	5	27	2	1429	100
Wales	127	19	173	26	122	18	189	29	27	4	23	3	661	100
Northern Ireland	21	10	43	21	30	15	78	39	8	4	21	10	201	100
Scotland	177	15	310	27	245	21	347	30	43	4	25	2	1147	100
United Kingdom	**1945**	**16**	**3001**	**24**	**2523**	**20**	**4084**	**33**	**538**	**4**	**400**	**3**	**12491**	**100**

Table 31 : Whole size of invasive cancers with invasive size <15mm												
	Whole size <15mm		Whole size 15-19mm		Whole size 20-49mm		Whole size 50+mm		Whole size unknown		Total	
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
N East, Yorks & Humber	547	68	79	10	134	17	44	5	0	0	804	100
East Midlands	402	73	56	10	76	14	18	3	0	0	552	100
East of England	477	75	66	10	79	12	10	2	5	1	637	100
London	371	69	52	10	67	13	12	2	33	6	535	100
South East Coast	362	74	54	11	62	13	10	2	0	0	488	100
South Central	360	75	42	9	59	12	10	2	9	2	480	100
South West	544	77	70	10	78	11	9	1	1	0	702	100
West Midlands	419	74	59	10	71	12	16	3	4	1	569	100
North West	586	80	69	9	63	9	12	2	2	0	732	100
Wales	300	83	22	6	26	7	13	4	0	0	361	100
Northern Ireland	64	68	5	5	17	18	1	1	7	7	94	100
Scotland	486	79	49	8	65	11	12	2	1	0	613	100
United Kingdom	**4918**	**75**	**623**	**9**	**797**	**12**	**167**	**3**	**62**	**1**	**6567**	**100**

Table 32 : Mastectomy rate of <15mm invasive cancers by whole tumour size								
	<15mm		15-<20mm		20-<50mm		50+mm	
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
N East, Yorks & Humber	77	14	17	22	47	35	38	86
East Midlands	68	17	11	20	33	43	18	100
East of England	58	12	10	15	36	46	6	60
London	49	13	5	10	30	45	9	75
South East Coast	36	10	10	19	27	44	9	90
South Central	31	9	5	12	19	32	9	90
South West	53	10	9	13	25	32	8	89
West Midlands	42	10	14	24	20	28	15	94
North West	88	15	17	25	24	38	10	83
Wales	52	17	6	27	9	35	10	77
Northern Ireland	8	13	2	40	7	41	0	0
Scotland	64	13	9	18	29	45	11	92
United Kingdom	**626**	**13**	**115**	**18**	**306**	**38**	**143**	**86**

Table 33 : Immediate reconstruction with mastectomy (all cancers)								
	Immediate reconstruction		No immediate reconstruction		Unknown		Total mastectomies	
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
N East, Yorks & Humber	47	8	421	70	130	22	598	100
East Midlands	33	9	321	84	27	7	381	100
East of England	78	18	249	58	101	24	428	100
London	55	15	217	59	95	26	367	100
South East Coast	62	21	169	58	60	21	291	100
South Central	32	12	175	66	60	22	267	100
South West	73	20	248	67	47	13	368	100
West Midlands	53	15	278	80	18	5	349	100
North West	53	10	423	83	33	6	509	100
Wales	20	9	209	91	0	0	229	100
Northern Ireland	3	4	70	96	0	0	73	100
Scotland	26	7	371	93	0	0	397	100
United Kingdom	**535**	**13**	**3151**	**74**	**571**	**13**	**4257**	**100**

Table 34 : Invasive status of cancers which had immediate reconstruction with mastectomy										
	Invasive		Micro-invasive		Non-invasive		Unknown		Total	
Region	No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	25	53	1	2	21	45	0	0	47	100
East Midlands	24	73	1	3	8	24	0	0	33	100
East of England	50	64	3	4	25	32	0	0	78	100
London	34	62	1	2	20	36	0	0	55	100
South East Coast	43	69	0	0	19	31	0	0	62	100
South Central	18	56	1	3	13	41	0	0	32	100
South West	43	59	4	5	26	36	0	0	73	100
West Midlands	23	43	1	2	29	55	0	0	53	100
North West	27	51	3	6	23	43	0	0	53	100
Wales	14	70	1	5	5	25	0	0	20	100
Northern Ireland	3	100	0	0	0	0	0	0	3	100
Scotland	11	42	3	12	12	46	0	0	26	100
United Kingdom	**315**	**59**	**19**	**4**	**201**	**38**	**0**	**0**	**535**	**100**

Table 35: Waiting time - assessment to first diagnostic surgery												
	Total	≤14 days		≤31 days		≤45 days		≤62 days		≤90 days		Median
Region	cancers	No	%	No	%	No	%	No	%	No	%	days
N East, Yorks & Humber	78	4	5	23	29	56	72	69	88	76	97	36
East Midlands	38	2	5	17	45	26	68	32	84	36	95	33.5
East of England	118	6	5	52	44	86	73	103	87	115	97	34
London*	103	5	5	38	37	63	61	89	86	95	92	38
South East Coast	82	2	2	19	23	47	57	64	78	78	95	43.5
South Central	81	2	2	46	57	66	81	76	94	80	99	30
South West	101	2	2	28	28	56	55	80	79	93	92	43
West Midlands	62	3	5	20	32	44	71	54	87	60	97	35
North West	108	5	5	53	49	88	81	100	93	103	95	32.5
Wales	28	4	14	19	68	21	75	26	93	26	93	26
Northern Ireland	15	0	0	4	27	8	53	12	80	15	100	43
Scotland	74	6	8	26	35	41	55	55	74	63	85	43
United Kingdom	**888**	**41**	**5**	**345**	**39**	**602**	**68**	**760**	**86**	**840**	**95**	**36**

Table 36 : Waiting time - assessment to first therapeutic surgery												
	Total	≤14 days		≤31 days		≤45 days		≤62 days		≤90 days		Median
Region	cancers	No	%	No	%	No	%	No	%	No	%	days
N East, Yorks & Humber	1844	145	8	1066	58	1624	88	1772	96	1816	98	29
East Midlands	1119	127	11	745	67	991	89	1059	95	1082	97	27
East of England	1453	124	9	829	57	1231	85	1358	93	1422	98	29
London	1334	46	3	505	38	962	72	1180	88	1263	95	35
South East Coast	1132	35	3	430	38	839	74	1026	91	1103	97	36
South Central	1058	91	9	655	62	930	88	1007	95	1038	98	27
South West	1489	54	4	638	43	1173	79	1361	91	1453	98	34
West Midlands	1316	149	11	865	66	1201	91	1269	96	1298	99	27
North West	1642	128	8	971	59	1475	90	1584	96	1619	99	29
Wales	785	86	11	569	72	711	91	769	98	781	99	24
Northern Ireland	226	36	16	154	68	199	88	220	97	225	100	23
Scotland	1316	133	10	831	63	1110	84	1225	93	1276	97	28
United Kingdom	**14714**	**1154**	**8**	**8258**	**56**	**12446**	**85**	**13830**	**94**	**14376**	**98**	**29**

Table 37 : Waiting time - screen to first therapeutic surgery											
Region	Total cancers	≤14 days		≤31 days		≤45 days		≤62 days		≤90 days		Median days
		No	%	No	%	No	%	No	%	No	%	
N East, Yorks & Humber	1844	1	0	192	10	844	46	1520	82	1784	97	48
East Midlands	1116	0	0	131	12	566	51	924	83	1059	95	45
East of England	1448	1	0	62	4	422	29	983	68	1350	93	55
London	1331	1	0	29	2	205	15	708	53	1148	86	61
South East Coast	1126	2	0	45	4	312	28	747	66	1028	91	55
South Central	1054	2	0	235	22	594	56	911	86	1010	96	42
South West	1485	0	0	70	5	378	25	893	60	1340	90	57
West Midlands	1314	3	0	176	13	705	54	1139	87	1271	97	44
North West	1635	3	0	161	10	598	37	1175	72	1556	95	52
Wales	785	0	0	165	21	418	53	655	83	762	97	44
Northern Ireland	225	2	1	25	11	83	37	164	73	220	98	50
Scotland	1309	4	0	102	8	444	34	940	72	1219	93	52
United Kingdom	**14672**	**19**	**0**	**1393**	**9**	**5569**	**38**	**10759**	**73**	**13747**	**94**	**50**

Table 38: Availability of lymph node status for invasive cancers									
Region	Total invasive cancers with surgery	Nodal status known		Nodes obtained but status unknown		No nodes obtained		Unknown if nodes obtained	
		No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	1478	1440	97	0	0	28	2	10	1
East Midlands	936	926	99	0	0	10	1	0	0
East of England	1213	1166	96	0	0	46	4	1	0
London	1091	1040	95	1	0	42	4	8	1
South East Coast	923	885	96	0	0	38	4	0	0
South Central	925	903	98	0	0	22	2	0	0
South West	1245	1212	97	0	0	33	3	0	0
West Midlands	1100	1087	99	0	0	13	1	0	0
North West	1417	1382	98	0	0	35	2	0	0
Wales	650	645	99	0	0	5	1	0	0
Northern Ireland	200	189	95	0	0	11	6	0	0
Scotland	1134	1118	99	0	0	11	1	5	0
United Kingdom	**12312**	**11993**	**97**	**1**	**0**	**294**	**2**	**24**	**0.2**

Table 39 : Sentinel lymph node procedure for invasive cancers with axillary surgery								
Region	With SLNB		Without SLNB		Unknown SLNB		Total	
	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	200	14	657	46	583	40	1440	100
East Midlands	352	38	565	61	9	1	926	100
East of England	616	53	432	37	120	10	1168	100
London	515	49	522	50	4	0	1041	100
South East Coast	432	49	453	51	0	0	885	100
South Central	446	49	369	41	88	10	903	100
South West	488	40	691	57	33	3	1212	100
West Midlands	457	42	631	58	0	0	1088	100
North West	516	37	866	63	0	0	1382	100
Wales	106	16	536	83	3	0	645	100
Northern Ireland	61	32	128	68	0	0	189	100
Scotland	355	32	8	1	756	68	1119	100
United Kingdom	**4544**	**38**	**5858**	**49**	**1596**	**13**	**11998**	**100**

Table 40 : Average number of nodes obtained - invasive cancers						
	Without/unknown SLNB			With SLNB		
Region	Total	Mean	Median	Total	Mean	Median
N East, Yorks & Humber	1240	9	8	200	5	2
East Midlands	574	9	6	352	6	5
East of England	552	9	8	616	5	4
London	526	13	12	515	7	4
South East Coast	453	10	8	432	6	4
South Central	457	10	9	446	5	3
South West	724	10	8	488	7	6
West Midlands	631	9	6	457	7	4
North West	866	11	9	516	5	3
Wales	539	9	6	106	5	3
Northern Ireland	128	18	16	61	5	2
Scotland	764	10	6	355	5	4
United Kingdom	**7454**	**10**	**8**	**4544**	**6**	**4**

Table 41 : Nodal status of invasive cancers with known status					
	Total known nodal status	Positive		Negative	
Region		No.	%	No.	%
N East, Yorks & Humber	1440	315	22	1125	78
East Midlands	926	201	22	725	78
East of England	1166	272	23	894	77
London	1040	245	24	795	76
South East Coast	885	229	26	656	74
South Central	903	203	22	700	78
South West	1212	275	23	937	77
West Midlands	1087	284	26	803	74
North West	1382	342	25	1040	75
Wales	645	133	21	512	79
Northern Ireland	189	53	28	136	72
Scotland	1118	273	24	845	76
United Kingdom	**11993**	**2825**	**24**	**9168**	**76**

Table 42 : Status of invasive cases with <4 nodes obtained													
	Total with nodal status known	Nodal status determined on basis of <4 nodes		Positive				Negative				Unknown status	
				Sentinel node procedure		Other		Sentinel node procedure		Other			
Region		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	1440	185	12.8	13	0.9	4	0.3	138	9.6	30	2.1	0	0
East Midlands	926	121	13.1	8	0.9	0	0.0	92	9.9	21	2.3	0	0
East of England	1166	304	26.1	14	1.2	3	0.3	258	22.1	29	2.5	0	0
London	1040	213	20.5	4	0.4	4	0.4	183	17.6	22	2.1	0	0
South East Coast	885	221	25.0	8	0.9	3	0.3	173	19.5	37	4.2	0	0
South Central	903	285	31.6	12	1.3	1	0.1	251	27.8	21	2.3	0	0
South West	1212	167	13.8	4	0.3	2	0.2	107	8.8	54	4.5	0	0
West Midlands	1087	206	19.0	6	0.6	2	0.2	172	15.8	26	2.4	0	0
North West	1382	306	22.1	14	1.0	9	0.7	245	17.7	38	2.7	0	0
Wales	645	122	18.9	0	0.0	2	0.3	69	10.7	51	7.9	0	0
Northern Ireland	189	48	25.4	5	2.6	0	0.0	40	21.2	3	1.6	0	0
Scotland	1118	107	9.6	5	0.4	0	0.0	90	8.1	12	1.1	0	0
United Kingdom	**11993**	**2285**	**19.1**	**93**	**0.8**	**30**	**0.3**	**1818**	**15.2**	**344**	**2.9**	**0**	**0**

Table 43 : Nodal status of invasive cancers with/without SLNB								
	With SLNB				Without SLNB			
	Positive		Negative		Positive		Negative	
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
N East, Yorks & Humber	33	17	167	84	163	25	494	75
East Midlands	66	19	286	81	132	23	433	77
East of England	124	20	490	80	122	28	310	72
London	92	18	422	82	151	29	371	71
South East Coast	106	25	326	75	123	27	330	73
South Central	85	19	361	81	100	27	269	73
South West	108	22	380	78	159	23	532	77
West Midlands	99	22	357	78	185	29	446	71
North West	93	18	423	82	249	29	617	71
Wales	17	16	89	84	116	22	420	78
Northern Ireland	9	15	52	85	44	34	84	66
Scotland	55	15	300	85	2	25	6	75
United Kingdom	**887**	**20**	**3653**	**80**	**1546**	**26**	**4312**	**74**

Table 44 : Number of nodes obtained for invasive cancers with positive nodal status determined from SLNB										
	1-<4 nodes					4+ nodes				
	1 axillary op		2+ axillary op			1 axillary op		2+ axillary op		
Region	**No.**	**%**	**No.**	**%**	**Total**	**No.**	**%**	**No.**	**%**	**Total**
N East, Yorks & Humber	13	100	0	0	13	4	20	16	80	20
East Midlands	8	100	0	0	8	50	86	8	14	58
East of England	14	100	0	0	14	57	52	53	48	110
London	4	100	0	0	4	50	57	38	43	88
South East Coast	8	100	0	0	8	67	68	31	32	98
South Central	12	100	0	0	12	20	27	53	73	73
South West	4	100	0	0	4	65	63	39	38	104
West Midlands	6	100	0	0	6	59	63	34	37	93
North West	14	100	0	0	14	42	53	37	47	79
Wales	0	-	0	-	0	2	12	15	88	17
Northern Ireland	5	100	0	0	5	3	75	1	25	4
Scotland	5	100	0	0	5	44	88	6	12	50
United Kingdom	**93**	**100**	**0**	**0**	**93**	**463**	**58**	**331**	**42**	**794**

Table 45 : Availability of lymph node status for non-invasive cancers									
	Total non-invasive cancers	**Nodal status known**		**Nodes obtained but status unknown**		**No nodes obtained**		**Unknown if nodes obtained**	
Region		**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
N East, Yorks & Humber	427	114	27	0	0	313	73	0	0
East Midlands	206	70	34	0	0	136	66	0	0
East of England	344	85	25	0	0	259	75	0	0
London	343	106	31	0	0	236	69	1	0
South East Coast	290	74	26	0	0	216	74	0	0
South Central	204	60	29	0	0	144	71	0	0
South West	321	80	25	0	0	241	75	0	0
West Midlands	267	70	26	0	0	197	74	0	0
North West	306	88	29	0	0	218	71	0	0
Wales	159	39	25	0	0	120	75	0	0
Northern Ireland	39	13	33	0	0	26	67	0	0
Scotland	249	70	28	0	0	179	72	0	0
United Kingdom	**3155**	**869**	**28**	**0**	**0**	**2285**	**72**	**1**	**0**

Table 46 : Nodal status of non-invasive cancers					
Region	Total known nodal status	Positive		Negative	
		No.	%	No.	%
N East, Yorks & Humber	114	1	1	113	99
East Midlands	70	0	0	70	100
East of England	85	1	1	84	99
London	106	0	0	106	100
South East Coast	74	2	3	72	97
South Central	60	1	2	59	98
South West	80	0	0	80	100
West Midlands	70	0	0	70	100
North West	88	2	2	86	98
Wales	39	0	0	39	100
Northern Ireland	13	1	8	12	92
Scotland	70	0	0	70	100
United Kingdom	**869**	**8**	**1**	**861**	**99**

Table 47 : Treatment for non-invasive cancers with known nodal status					
Region	Total	Conservation		Mastectomy	
		No.	%	No.	%
N East, Yorks & Humber	114	22	19	92	81
East Midlands	70	4	6	66	94
East of England	85	22	26	63	74
London	106	25	24	81	76
South East Coast	74	13	18	61	82
South Central	60	15	25	45	75
South West	80	18	23	62	78
West Midlands	70	10	14	60	86
North West	88	24	27	64	73
Wales	39	5	13	34	87
Northern Ireland	13	7	54	6	46
Scotland	70	3	4	67	96
United Kingdom	**869**	**168**	**19**	**701**	**81**

Table 48 : Average number of nodes obtained - non-invasive cancers							
Region	Total with nodal status known	Conservation			Mastectomy		
		Mean	Median	Maximum	Mean	Median	Maximum
N East, Yorks & Humber	114	4	4	7	6	5	20
East Midlands	70	5	5	6	5	4.5	19
East of England	85	4	4	13	4	3	14
London	106	4	3	11	6	4	33
South East Coast	74	4	3	9	4	4	12
South Central	60	4	3	10	4	4	14
South West	80	6	4.5	15	5	4.5	15
West Midlands	70	3	3	6	5	5	14
North West	88	4	3	9	5	4	29
Wales	39	1	1	2	5	4	17
Northern Ireland	13	2	1.5	6	3	2	10
Scotland	70	4	5	5	5	5	14
United Kingdom	**869**	**4**	**3.5**	**15**	**5**	**4**	**33**

Table 49 : Non-operative history for non-invasive cancers with known nodal status treated by conservation											
Region	Total	B5A		B5B		B5C		C5 only		No C5/B5	
		No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	22	15	68	0	0	6	27	0	0	1	5
East Midlands	4	3	75	0	0	1	25	0	0	0	0
East of England	22	20	91	0	0	1	5	0	0	1	5
London	25	22	88	0	0	0	0	2	8	1	4
South East Coast	13	13	100	0	0	0	0	0	0	0	0
South Central	15	12	80	0	0	1	7	1	7	1	7
South West	18	15	83	0	0	1	6	2	11	0	0
West Midlands	10	7	70	0	0	2	20	0	0	1	10
North West	24	21	88	0	0	1	4	1	4	1	4
Wales	5	4	80	0	0	1	20	0	0	0	0
Northern Ireland	7	6	86	0	0	0	0	0	0	1	14
Scotland	3	2	67	0	0	0	0	0	0	1	33
United Kingdom	**168**	**140**	**83**	**0**	**0**	**14**	**8**	**6**	**4**	**8**	**5**

Table 50 : Grade of invasive cancers												
Region	Grade I		Grade II		Grade III		Not assessable		Unknown		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	428	29	739	50	280	19	3	0	28	2	1478	100
East Midlands	209	22	502	54	212	23	4	0	9	1	936	100
East of England	309	25	608	50	263	22	18	1	15	1	1213	100
London	310	28	541	50	216	20	6	1	18	2	1091	100
South East Coast	245	27	472	51	198	21	3	0	5	1	923	100
South Central	288	31	481	52	146	16	4	0	6	1	925	100
South West	353	28	647	52	233	19	10	1	2	0	1245	100
West Midlands	278	25	570	52	246	22	3	0	3	0	1100	100
North West	408	29	698	49	288	20	17	1	6	0	1417	100
Wales	198	30	340	52	99	15	3	0	10	2	650	100
Northern Ireland	45	23	88	44	63	32	1	1	3	2	200	100
Scotland	249	22	540	48	322	28	11	1	12	1	1134	100
United Kingdom	**3320**	**27**	**6226**	**51**	**2566**	**21**	**83**	**1**	**117**	**1**	**12312**	**100**

Table 51 : Data completeness for invasive cancers (with surgery)									
Region	Unknown invasive size		Unknown nodal status		Unknown grade		Unknown NPI		Total invasive
	No.	%	No.	%	No.	%	No.	%	
N East, Yorks & Humber	31	2	38	3	28	2	60	4	1478
East Midlands	10	1	10	1	9	1	24	3	936
East of England	19	2	47	4	15	1	80	7	1213
London	21	2	51	5	18	2	69	6	1091
South East Coast	6	1	38	4	5	1	45	5	923
South Central	7	1	22	2	6	1	32	3	925
South West	15	1	33	3	2	0	49	4	1245
West Midlands	8	1	13	1	3	0	22	2	1100
North West	14	1	35	2	6	0	62	4	1417
Wales	12	2	5	1	10	2	24	4	650
Northern Ireland	3	2	11	6	3	2	15	8	200
Scotland	12	1	16	1	12	1	36	3	1134
United Kingdom	**158**	**1**	**319**	**3**	**117**	**1**	**518**	**4**	**12312**

Table 52 : NPI Group of invasive cancers												
	EPG		GPG		MPG1		MPG2		PPG		Total	
Region	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	347	24	516	36	319	22	148	10	88	6	1418	100
East Midlands	182	20	347	38	237	26	94	10	52	6	912	100
East of England	248	22	393	35	292	26	125	11	75	7	1133	100
London	224	22	361	35	253	25	123	12	61	6	1022	100
South East Coast	176	20	308	35	252	29	90	10	52	6	878	100
South Central	232	26	322	36	179	20	110	12	50	6	893	100
South West	277	23	463	39	263	22	121	10	72	6	1196	100
West Midlands	220	20	372	35	283	26	121	11	82	8	1078	100
North West	311	23	478	35	310	23	161	12	95	7	1355	100
Wales	166	27	233	37	135	22	51	8	41	7	626	100
Northern Ireland	35	19	55	30	48	26	25	14	22	12	185	100
Scotland	210	19	365	33	284	26	151	14	88	8	1098	100
United Kingdom	**2628**	**22**	**4213**	**36**	**2855**	**24**	**1320**	**11**	**778**	**7**	**11794**	**100**

Table 53 : Annual screening surgical caseload per surgeon												
	Total surgeons	<10 cases		10-19 cases		20-29 cases		30-99 cases		100+ cases	
Region		No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	70	21	30	13	19	8	11	27	39	1	1
East Midlands	34	9	26	2	6	4	12	19	56	0	0
East of England	66	28	42	6	9	5	8	27	41	0	0
London	97	55	57	14	14	10	10	18	19	0	0
South East Coast	58	29	50	4	7	6	10	18	31	1	2
South Central	41	15	37	3	7	6	15	17	41	0	0
South West	48	10	21	10	21	5	10	22	46	1	2
West Midlands	56	17	30	11	20	5	9	23	41	0	0
North West	65	27	42	7	11	7	11	23	35	1	2
Wales	22	7	32	1	5	1	5	13	59	0	0
Northern Ireland	14	4	29	4	29	4	29	2	14	0	0
Scotland	51	24	47	6	12	2	4	18	35	1	2
United Kingdom	**559**	**186**	**33**	**74**	**13**	**63**	**11**	**230**	**41**	**6**	**1**

The surgeons in each Region are credited with their total UK screening caseload.
Surgeons working in more than one Region appear in each of these Regions' figures.

Table 54 : Screening cases per surgeon					
Region	Total surgeons	Mean	Min.	Median	Max.
N East, Yorks & Humber	70	28	1	22.5	152
East Midlands	34	36	1	36.5	79
East of England	66	25	1	17.5	88
London	97	15	1	7	94
South East Coast	58	21	1	10	108
South Central	41	29	1	21	99
South West	48	34	1	27	111
West Midlands	56	25	1	20.5	81
North West	65	28	1	18	104
Wales	22	38	1	48.5	85
Northern Ireland	14	17	1	16.5	41
Scotland	51	27	1	12	204
United Kingdom	**559**	**29**	**1**	**22**	**204**

Table 55 : Number of surgeons treating each woman									
Region	Total cancers	Number of women treated by…							
		No referral		1 surgeon		2 surgeons		3+ surgeons	
		No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	1965	0	0	1965	100	0	0	0	0
East Midlands	1195	0	0	1162	97	32	3	1	0
East of England	1602	11	1	1548	97	42	3	1	0
London	1472	6	0	1445	98	21	1	0	0
South East Coast	1223	2	0	1221	100	0	0	0	0
South Central	1146	1	0	1119	98	25	2	1	0
South West	1610	0	0	1610	100	0	0	0	0
West Midlands	1399	3	0	1396	100	0	0	0	0
North West	1768	4	0	1737	98	27	2	0	0
Wales	825	0	0	808	98	17	2	0	0
Northern Ireland	245	3	1	242	99	0	0	0	0
Scotland	1406	7	0	1399	100	0	0	0	0
United Kingdom	**15856**	**37**	**0**	**15652**	**99**	**164**	**1**	**3**	**0**

Table 56 : Proportion of women referred to consultant surgeons according to annual caseload of surgeon											
Region	Total (referred)	<10 cases		10-19 cases		20-29 cases		30-99 cases		100+ cases	
		No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	1965	48	2	190	10	202	10	1373	70	152	8
East Midlands	1195	28	2	22	2	98	8	1081	88	0	0
East of England	1591	85	5	87	5	123	8	1340	82	0	0
London	1466	155	10	206	14	231	16	895	60	0	0
South East Coast	1221	61	5	63	5	145	12	844	69	108	9
South Central	1145	34	3	53	5	146	12	939	80	0	0
South West	1610	49	3	134	8	126	8	1190	74	111	7
West Midlands	1396	38	3	167	12	125	9	1066	76	0	0
North West	1764	76	4	108	6	168	9	1335	75	104	6
Wales	825	23	3	19	2	21	2	779	93	0	0
Northern Ireland	242	13	5	55	23	103	43	71	29	0	0
Scotland	1399	82	6	85	6	47	3	981	70	204	15
United Kingdom	**15819**	**572**	**4**	**1070**	**7**	**1533**	**10**	**12035**	**75**	**779**	**5**

Table 57 : Explanations for surgeons treating less than 10 screening cases in 2005/06									
Region	Total	Other caseload >30 year	Joined NHSBSP	Left NHSBSP	Plastic surgeon	Private practice	Not screening in area	No infor-mation	Other
N East, Yorks & Humber	21	12	0	5	1	0	3	0	0
East Midlands	9	4	0	0	2	0	3	0	0
East of England	28	7	1	0	7	4	6	2	1
London	55	22	2	2	2	7	9	9	2
South East Coast	29	10	8	3	1	0	4	2	1
South Central	15	5	2	0	4	1	1	2	0
South West	10	4	1	0	0	0	0	5	0
West Midlands	17	6	1	1	1	3	3	1	1
North West	27	19	4	0	0	2	2	0	0
Wales	7	5	0	0	1	0	1	0	0
Northern Ireland	4	4	0	0	0	0	0	0	0
Scotland	24	22	0	0	0	0	1	0	1
United Kingdom	**186**	**86**	**19**	**10**	**19**	**11**	**20**	**16**	**5**

Table 58 : Number of therapeutic operations for cancers with a non-operative diagnosis (C5 and/or B5)														
	0		1		2		3+		Unknown		Total		Repeat (2+) rate	
Region	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	30	2	1486	79	331	18	27	1	13	1	1887	100	358	19
East Midlands	38	3	955	83	154	13	10	1	0	0	1157	100	164	14
East of England	31	2	1211	82	224	15	18	1	0	0	1484	100	242	16
London	22	2	1083	79	236	17	16	1	12	1	1369	100	252	18
South East Coast	9	1	898	79	222	19	12	1	0	0	1141	100	234	21
South Central	7	1	866	81	178	17	14	1	0	0	1065	100	192	18
South West	20	1	1186	79	278	18	25	2	0	0	1509	100	303	20
West Midlands	21	2	1086	81	213	16	17	1	0	0	1337	100	230	17
North West	18	1	1406	85	223	13	13	1	0	0	1660	100	236	14
Wales	12	2	645	81	126	16	14	2	0	0	797	100	140	18
Northern Ireland	4	2	197	86	26	11	3	1	0	0	230	100	29	13
Scotland	14	1	1123	84	185	14	8	1	2	0	1332	100	193	14
United Kingdom	**226**	**2**	**12142**	**81**	**2396**	**16**	**177**	**1**	**27**	**0**	**14968**	**100**	**2573**	**17**

Table 59 : Number of therapeutic operations for cancers without a non-operative diagnosis (B5 and/or C5)														
	Open biopsy only		1		2		3+		Unknown		Total cancers		Repeat (2+) rate	
Region	No	%	No	%	No	%	No	%	No	%	No	%	No	%
N East, Yorks & Humber	34	44	39	50	4	5	1	1	0	0	78	100	43	55
East Midlands	16	42	16	42	6	16	0	0	0	0	38	100	22	58
East of England	67	57	47	40	4	3	0	0	0	0	118	100	51	43
London	65	63	31	30	7	7	0	0	0	0	103	100	38	37
South East Coast	45	55	36	44	1	1	0	0	0	0	82	100	37	45
South Central	39	48	37	46	5	6	0	0	0	0	81	100	42	52
South West	55	54	40	40	6	6	0	0	0	0	101	100	46	46
West Midlands	27	44	30	48	5	8	0	0	0	0	62	100	35	56
North West	50	46	57	53	1	1	0	0	0	0	108	100	58	54
Wales	6	21	22	79	0	0	0	0	0	0	28	100	22	79
Northern Ireland	7	47	7	47	1	7	0	0	0	0	15	100	8	53
Scotland	38	51	31	42	5	7	0	0	0	0	74	100	36	49
United Kingdom	**449**	**51**	**393**	**44**	**45**	**5**	**1**	**0**	**0**	**0**	**888**	**100**	**438**	**49**

Table 60 : Number of therapeutic operations (invasive cancers)														
	0		1		2		3+		Unknown		Total		Repeat (2+) rate	
Region	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	27	2	1185	79	261	17	19	1	10	1	1502	100	280	19
East Midlands	30	3	805	84	122	13	7	1	0	0	964	100	129	13
East of England	46	4	1004	81	178	14	13	1	0	0	1241	100	191	15
London	24	2	875	79	191	17	11	1	9	1	1110	100	202	18
South East Coast	15	2	735	79	171	18	9	1	0	0	930	100	180	19
South Central	8	1	761	82	150	16	10	1	0	0	929	100	160	17
South West	29	2	990	79	224	18	17	1	0	0	1260	100	241	19
West Midlands	18	2	921	82	167	15	11	1	0	0	1117	100	178	16
North West	21	1	1226	86	172	12	10	1	0	0	1429	100	182	13
Wales	12	2	538	81	100	15	11	2	0	0	661	100	111	17
Northern Ireland	3	1	173	86	22	11	3	1	0	0	201	100	25	12
Scotland	16	1	962	84	159	14	8	1	2	0	1147	100	167	15
United Kingdom	**242**	**2**	**10175**	**81**	**1917**	**15**	**129**	**1**	**21**	**0**	**12491**	**100**	**2046**	**16**

Table 61 : Number of therapeutic operations (non-invasive cancers)														
	0		1		2		3+		Unknown		Total		Repeat (2+) rate	
Region	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	35	8	324	75	65	15	9	2	0	0	433	100	74	17
East Midlands	17	8	155	74	35	17	3	1	0	0	210	100	38	18
East of England	52	15	242	70	48	14	5	1	0	0	347	100	53	15
London	62	18	232	67	45	13	5	1	1	0	345	100	50	14
South East Coast	39	13	198	68	52	18	3	1	0	0	292	100	55	19
South Central	36	18	132	64	33	16	4	2	0	0	205	100	37	18
South West	41	13	219	68	55	17	7	2	0	0	322	100	62	19
West Midlands	30	11	185	68	51	19	5	2	0	0	271	100	56	21
North West	45	15	220	71	43	14	2	1	0	0	310	100	45	15
Wales	6	4	126	79	25	16	3	2	0	0	160	100	28	18
Northern Ireland	6	15	29	73	5	13	0	0	0	0	40	100	5	13
Scotland	36	14	184	74	30	12	0	0	0	0	250	100	30	12
United Kingdom	**405**	**13**	**2246**	**71**	**487**	**15**	**46**	**1**	**1**	**0**	**3185**	**100**	**533**	**17**

Table 62 : Number of therapeutic operations (B5b (invasive) core biopsies : invasive at surgery)												
	1		2		3+		Unknown		Total		Repeat (2+) rate	
Region	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	987	84	179	15	13	1	0	0	1179	100	192	16
East Midlands	756	88	96	11	6	1	0	0	858	100	102	12
East of England	900	85	142	13	11	1	0	0	1053	100	153	15
London	793	83	153	16	10	1	1	0	957	100	163	17
South East Coast	617	83	117	16	5	1	0	0	739	100	122	17
South Central	684	85	116	14	7	1	0	0	807	100	123	15
South West	883	83	164	15	13	1	0	0	1060	100	177	17
West Midlands	835	87	121	13	5	1	0	0	961	100	126	13
North West	1005	89	113	10	9	1	0	0	1127	100	122	11
Wales	486	85	79	14	9	2	0	0	574	100	88	15
Northern Ireland	119	86	17	12	3	2	0	0	139	100	20	14
Scotland	907	88	117	11	7	1	0	0	1031	100	124	12
United Kingdom	**8972**	**86**	**1414**	**13**	**98**	**1**	**1**	**0**	**10485**	**100**	**1512**	**14**

Table 63 : Sequence of operations (B5b (invasive) core biopsies : invasive at surgery)																		
	Cons. & Ax		Mx. & Ax		Cons. & Ax then Cons.		Cons. & Ax then Mx		Other (Ax at 1st op)		Other (Ax at later op)		Other no Ax		Unknown		Total	
Region	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	713	60	262	22	84	7	39	3	66	6	3	0	12	1	0	0	1179	100
East Midlands	535	62	216	25	46	5	22	3	32	4	1	0	6	1	0	0	858	100
East of England	664	63	215	20	41	4	22	2	83	8	7	1	21	2	0	0	1053	100
London	584	61	179	19	69	7	25	3	57	6	10	1	32	3	1	0	957	100
South East Coast	467	63	131	18	62	8	20	3	38	5	2	0	19	3	0	0	739	100
South Central	549	68	126	16	36	4	15	2	69	9	3	0	9	1	0	0	807	100
South West	714	67	156	15	69	7	24	2	80	8	3	0	14	1	0	0	1060	100
West Midlands	656	68	170	18	48	5	29	3	49	5	0	0	9	1	0	0	961	100
North West	728	65	264	23	32	3	27	2	57	5	6	1	13	1	0	0	1127	100
Wales	362	63	120	21	30	5	17	3	40	7	3	1	2	0	0	0	574	100
Northern Ireland	95	68	23	17	5	4	7	5	5	4	2	1	2	1	0	0	139	100
Scotland	666	65	232	23	50	5	19	2	41	4	14	1	9	1	0	0	1031	100
United Kingdom	**6733**	**64**	**2094**	**20**	**572**	**5**	**266**	**3**	**617**	**6**	**54**	**1**	**148**	**1**	**1**	**0**	**10485**	**100**

Table 64 : Number of therapeutic operations (invasive cancers with C5 only, no B5)												
	1		2		3+		Unknown		Total		Repeat (2+) rate	
Region	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	93	82	19	17	2	2	0	0	114	100	21	18
East Midlands	5	83	1	17	0	0	0	0	6	100	1	17
East of England	37	97	1	3	0	0	0	0	38	100	1	3
London	25	86	4	14	0	0	0	0	29	100	4	14
South East Coast	69	76	20	22	2	2	0	0	91	100	22	24
South Central	25	89	3	11	0	0	0	0	28	100	3	11
South West	44	71	17	27	1	2	0	0	62	100	18	29
West Midlands	40	82	9	18	0	0	0	0	49	100	9	18
North West	134	83	27	17	0	0	0	0	161	100	27	17
Wales	2	67	1	33	0	0	0	0	3	100	1	33
Northern Ireland	33	94	2	6	0	0	0	0	35	100	2	6
Scotland	1	50	1	50	0	0	0	0	2	100	1	50
United Kingdom	**508**	**82**	**105**	**17**	**5**	**1**	**0**	**0**	**618**	**100**	**110**	**18**

Table 65 : Sequence of operations (invasive cancers with C5 only, no B5)																
	Cons. & Ax		Mx. & Ax		Cons. & Ax then Cons.		Cons. & Ax then Mx		Other (Ax at 1st op)		Other (Ax at later op)		Other no Ax		Total	
Region	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	76	67	17	15	9	8	4	4	6	5	2	2	0	0	114	100
East Midlands	2	33	3	50	0	0	1	17	0	0	0	0	0	0	6	100
East of England	30	79	2	5	1	3	0	0	1	3	0	0	4	11	38	100
London	21	72	2	7	3	10	1	3	1	3	0	0	1	3	29	100
South East Coast	58	64	7	8	13	14	2	2	3	3	4	4	4	4	91	100
South Central	18	64	6	21	0	0	1	4	2	7	0	0	1	4	28	100
South West	44	71	0	0	3	5	1	2	12	19	2	3	0	0	62	100
West Midlands	35	71	5	10	6	12	3	6	0	0	0	0	0	0	49	100
North West	116	72	16	10	11	7	5	3	9	6	2	1	2	1	161	100
Wales	0	0	2	67	0	0	0	0	0	0	1	33	0	0	3	100
Northern Ireland	22	63	10	29	0	0	2	6	0	0	0	0	1	3	35	100
Scotland	1	50	0	0	0	0	0	0	1	50	0	0	0	0	2	100
United Kingdom	**423**	**68**	**70**	**11**	**46**	**7**	**20**	**3**	**35**	**6**	**11**	**2**	**13**	**2**	**618**	**100**

Table 66 : Number of therapeutic operations (B5a (non-invasive) core biopsies: non-invasive or micro-invasive at surgery)												
	1		2		3+		Unknown		Total		Repeat (2+) rate	
Region	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	289	81	58	16	8	2	0	0	355	100	66	19
East Midlands	145	81	32	18	3	2	0	0	180	100	35	19
East of England	223	81	48	17	5	2	0	0	276	100	53	19
London	213	81	45	17	5	2	0	0	263	100	50	19
South East Coast	179	76	52	22	3	1	0	0	234	100	55	24
South Central	122	80	27	18	4	3	0	0	153	100	31	20
South West	205	77	54	20	8	3	0	0	267	100	62	23
West Midlands	174	76	48	21	6	3	0	0	228	100	54	24
North West	207	80	49	19	3	1	0	0	259	100	52	20
Wales	112	79	26	18	3	2	0	0	141	100	29	21
Northern Ireland	27	90	3	10	0	0	0	0	30	100	3	10
Scotland	170	85	31	15	0	0	0	0	201	100	31	15
United Kingdom	**2066**	**80**	**473**	**18**	**48**	**2**	**0**	**0**	**2587**	**100**	**521**	**20**

Table 67 : Sequence of operations (B5a (non-invasive) core biopsies : non-invasive or micro-invasive at surgery)																		
	Cons.		Mx. & Ax		Cons. then Cons.		Mx		Other (Ax at 1st op)		Other (Ax at later op)		Other no Ax		Unknown		Total	
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
N East, Yorks & Humber	179	50	68	19	29	8	29	8	17	5	17	5	16	5	0	0	355	100
East Midlands	80	44	60	33	27	15	4	2	3	2	4	2	2	1	0	0	180	100
East of England	142	51	49	18	24	9	16	6	24	9	11	4	10	4	0	0	276	100
London	130	49	63	24	19	7	5	2	27	10	17	6	2	1	0	0	263	100
South East Coast	114	49	46	20	37	16	11	5	14	6	6	3	6	3	0	0	234	100
South Central	85	56	21	14	9	6	6	4	16	10	14	9	2	1	0	0	153	100
South West	128	48	52	19	35	13	14	5	17	6	10	4	11	4	0	0	267	100
West Midlands	115	50	39	17	25	11	12	5	12	5	16	7	9	4	0	0	228	100
North West	127	49	46	18	17	7	13	5	30	12	16	6	10	4	0	0	259	100
Wales	73	52	29	21	19	13	5	4	6	4	4	3	5	4	0	0	141	100
Northern Ireland	15	50	6	20	2	7	1	3	6	20	0	0	0	0	0	0	30	100
Scotland	99	49	65	32	25	12	4	2	2	1	5	2	1	0	0	0	201	100
United Kingdom	**1287**	**50**	**544**	**21**	**268**	**10**	**120**	**5**	**174**	**7**	**120**	**5**	**74**	**3**	**0**	**0**	**2587**	**100**

Table 68 : Number of therapeutic operations (B5a (non-invasive) core biopsies : invasive at surgery)												
	1		2		3+		Unknown		Total		Repeat (2+) rate	
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
N East, Yorks & Humber	46	48	48	50	2	2	0	0	96	100	50	52
East Midlands	30	56	23	43	1	2	0	0	54	100	24	44
East of England	33	51	30	46	2	3	0	0	65	100	32	49
London	25	45	29	53	1	2	0	0	55	100	30	55
South East Coast	28	45	32	52	2	3	0	0	62	100	34	55
South Central	21	40	28	54	3	6	0	0	52	100	31	60
South West	24	37	39	60	2	3	0	0	65	100	41	63
West Midlands	23	37	33	53	6	10	0	0	62	100	39	63
North West	54	64	29	35	1	1	0	0	84	100	30	36
Wales	30	59	19	37	2	4	0	0	51	100	21	41
Northern Ireland	9	75	3	25	0	0	0	0	12	100	3	25
Scotland	28	44	34	54	1	2	0	0	63	100	35	56
United Kingdom	**351**	**49**	**347**	**48**	**23**	**3**	**0**	**0**	**721**	**100**	**370**	**51**

Table 69 : Sequence of operations (B5a (non-invasive) core biopsies : invasive at surgery)																
	Mx. & Ax		Cons. & Ax		Cons. then Cons. & Ax		Cons. then Ax		Other (Ax at 1st op)		Other (Ax at later op)		Other no Ax		Total	
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
N East, Yorks & Humber	29	30	8	8	12	13	13	14	8	8	15	16	11	11	96	100
East Midlands	27	50	2	4	10	19	7	13	2	4	5	9	1	2	54	100
East of England	12	18	14	22	8	12	7	11	6	9	11	17	7	11	65	100
London	13	24	6	11	8	15	7	13	10	18	5	9	6	11	55	100
South East Coast	14	23	4	6	17	27	0	0	10	16	6	10	11	18	62	100
South Central	6	12	9	17	10	19	8	15	6	12	5	10	8	15	52	100
South West	13	20	4	6	21	32	1	2	7	11	11	17	8	12	65	100
West Midlands	17	27	3	5	8	13	14	23	5	8	12	19	3	5	62	100
North West	26	31	16	19	10	12	6	7	4	5	9	11	13	15	84	100
Wales	11	22	16	31	2	4	7	14	8	16	5	10	2	4	51	100
Northern Ireland	3	25	0	0	0	0	0	0	0	0	3	25	6	50	12	100
Scotland	22	35	5	8	7	11	21	33	2	3	5	8	1	2	63	100
United Kingdom	**193**	**27**	**87**	**12**	**113**	**16**	**91**	**13**	**68**	**9**	**92**	**13**	**77**	**11**	**721**	**100**

APPENDIX F: ADJUVANT THERAPY DATA TABLES (70 – 113)

ADJUVANT THERAPY AUDIT FOR 1 APRIL 2005 – 31 MARCH 2006 WITH TUMOUR DATA FROM THE 2005/06 AUDIT OF SCREEN DETECTED BREAST CANCERS

Table 70 : 2005/06 cases supplied to the ABS at BASO adjuvant audit

Region	Total Cancers	No data supplied		Excluded cases		Total Eligible		Complete data*	
		No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	2102	0	0	442	21	1660	79	1429	68
East Midlands	1273	0	0	10	1	1263	99	1262	99
East of England	1521	123	8	78	5	1320	87	1214	80
London	1472	12	1	112	8	1348	92	1196	81
South East Coast	1298	354	27	423	33	521	40	481	37
South Central	1177	0	0	36	3	1141	97	948	81
South West	1602	86	5	64	4	1452	91	1315	82
West Midlands	1400	17	1	240	17	1143	82	942	67
North West	1678	0	0	159	9	1519	91	1297	77
Wales	842	0	0	45	5	797	95	766	91
Northern Ireland	232	68	29	1	0	163	70	158	68
Scotland	1349	2	0	23	2	1324	98	982	73
United Kingdom	**15946**	**662**	**4**	**1633**	**10**	**13651**	**86**	**11990**	**75**

* cases which are eligible and with complete RT, CT and HT data

Table 71 : Data completeness for adjuvant therapy

Region	Total Eligible	Complete RT		Complete CT		Complete HT		Complete RT,CT & HT	
		No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	1660	1502	90	1590	96	1600	96	1429	86
East Midlands	1263	1263	100	1263	100	1262	100	1262	100
East of England	1320	1293	98	1295	98	1245	94	1214	92
London	1348	1246	92	1316	98	1290	96	1196	89
South East Coast	521	505	97	504	97	498	96	481	92
South Central	1141	1094	96	1123	98	1000	88	948	83
South West	1452	1423	98	1408	97	1360	94	1315	91
West Midlands	1143	1080	94	1014	89	1007	88	942	82
North West	1519	1437	95	1383	91	1384	91	1297	85
Wales	797	770	97	791	99	794	100	766	96
Northern Ireland	163	160	98	163	100	161	99	158	97
Scotland	1324	994	75	1292	98	1311	99	982	74
United Kingdom	**13651**	**12767**	**94**	**13142**	**96**	**12912**	**95**	**11990**	**88**

Table 72 : ER status of included cases

Region	Invasive						Total Invasive	Non-invasive						Total non-inv
	ER Positive		ER negative		Not done or unknown			ER Positive		ER negative		Not done or unknown		
	No.	%	No.	%	No.	%		No.	%	No.	%	No.	%	
N East, Yorks & Humber	1143	87	156	12	21	2	1320	92	29	32	10	188	60	312
East Midlands	907	90	99	10	6	1	1012	82	35	27	11	127	54	236
East of England	927	88	87	8	44	4	1058	63	25	19	7	175	68	257
London	898	85	106	10	52	5	1056	117	42	48	17	115	41	280
South East Coast	348	85	48	12	13	3	409	34	31	10	9	65	60	109
South Central	817	88	86	9	27	3	930	71	35	19	9	113	56	203
South West	976	86	111	10	45	4	1132	164	52	42	13	112	35	318
West Midlands	864	91	77	8	7	1	948	89	48	25	14	70	38	184
North West	1045	86	147	12	22	2	1214	169	62	39	14	63	23	271
Wales	554	86	69	11	19	3	642	24	16	13	9	115	76	152
Northern Ireland	116	89	14	11	0	0	130	17	57	7	23	6	20	30
Scotland	958	90	98	9	8	1	1064	127	52	32	13	87	35	246
United Kingdom	**9550**	**87**	**1098**	**10**	**267**	**2**	**10915**	**1049**	**40**	**313**	**12**	**1236**	**48**	**2598**

Table 73 : PgR status of included cases								
	Positive		Negative		Not Done or Unknown		Total	
Region	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	790	48	353	21	517	31	1660	100
East Midlands	304	24	125	10	834	66	1263	100
East of England	395	30	169	13	756	57	1320	100
London	843	63	284	21	221	16	1348	100
South East Coast	311	60	97	19	113	22	521	100
South Central	588	52	180	16	373	33	1141	100
South West	615	42	246	17	591	41	1452	100
West Midlands	548	48	173	15	422	37	1143	100
North West	1013	67	336	22	170	11	1519	100
Wales	135	17	102	13	560	70	797	100
Northern Ireland	60	37	43	26	60	37	163	100
Scotland	574	43	243	18	507	38	1324	100
United Kingdom	**6176**	**45**	**2351**	**17**	**5124**	**38**	**13651**	**100**

Table 74 : PgR status of ER negative invasive cases								
	Positive		Negative		Not Done or Unknown		Total	
Region	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	8	5	130	83	18	12	156	100
East Midlands	8	8	55	56	36	36	99	100
East of England	3	3	54	62	30	34	87	100
London	5	5	100	94	1	1	106	100
South East Coast	9	19	39	81	0	0	48	100
South Central	8	9	67	78	11	13	86	100
South West	2	2	74	67	35	32	111	100
West Midlands	3	4	71	92	3	4	77	100
North West	12	8	122	83	13	9	147	100
Wales	1	1	54	78	14	20	69	100
Northern Ireland	1	7	9	64	4	29	14	100
Scotland	8	8	90	92	0	0	98	100
United Kingdom	**68**	**6**	**865**	**79**	**165**	**15**	**1098**	**100**

Table 75 : HER-2 status of invasive cancers								
	Positive		Negative		Not Done or Unknown		Total	
Region	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	97	7	672	51	551	42	1320	100
East Midlands	33	3	254	25	725	72	1012	100
East of England	61	6	311	29	686	65	1058	100
London	118	11	623	59	315	30	1056	100
South East Coast	30	7	143	35	236	58	409	100
South Central	96	10	449	48	385	41	930	100
South West	145	13	507	45	480	42	1132	100
West Midlands	56	6	439	46	453	48	948	100
North West	110	9	532	44	572	47	1214	100
Wales	40	6	166	26	436	68	642	100
Northern Ireland	5	4	59	45	66	51	130	100
Scotland	161	15	656	62	247	23	1064	100
United Kingdom	**952**	**9**	**4811**	**44**	**5152**	**47**	**10915**	**100**

Table 76 : Radiotherapy						
	Radiotherapy		No radiotherapy		Total	
Region	No.	%	No.	%	No.	%
N East, Yorks & Humber	858	57	644	43	1502	100
East Midlands	863	68	400	32	1263	100
East of England	930	72	363	28	1293	100
London	854	69	392	31	1246	100
South East Coast	332	66	173	34	505	100
South Central	736	67	358	33	1094	100
South West	994	70	429	30	1423	100
West Midlands	856	79	224	21	1080	100
North West	947	66	490	34	1437	100
Wales	531	69	239	31	770	100
Northern Ireland	123	77	37	23	160	100
Scotland	579	58	415	42	994	100
United Kingdom	**8603**	**67**	**4164**	**33**	**12767**	**100**

Table 77 : Chemotherapy						
	Chemotherapy		No chemotherapy		Total	
Region	No.	%	No.	%	No.	%
N East, Yorks & Humber	288	18	1302	82	1590	100
East Midlands	191	15	1072	85	1263	100
East of England	175	14	1120	86	1295	100
London	266	20	1050	80	1316	100
South East Coast	86	17	418	83	504	100
South Central	196	17	927	83	1123	100
South West	210	15	1198	85	1408	100
West Midlands	184	18	830	82	1014	100
North West	299	22	1084	78	1383	100
Wales	153	19	638	81	791	100
Northern Ireland	35	21	128	79	163	100
Scotland	243	19	1049	81	1292	100
United Kingdom	**2326**	**18**	**10816**	**82**	**13142**	**100**

Table 78 : Hormone therapy						
	Hormone therapy		No hormone therapy		Total	
Region	No.	%	No.	%	No.	%
N East, Yorks & Humber	1144	72	456	29	1600	100
East Midlands	914	72	348	28	1262	100
East of England	854	69	391	31	1245	100
London	935	72	355	28	1290	100
South East Coast	357	72	141	28	498	100
South Central	781	78	219	22	1000	100
South West	1007	74	353	26	1360	100
West Midlands	794	79	213	21	1007	100
North West	1036	75	348	25	1384	100
Wales	498	63	296	37	794	100
Northern Ireland	129	80	32	20	161	100
Scotland	991	76	320	24	1311	100
United Kingdom	**9440**	**73**	**3472**	**27**	**12912**	**100**

Table 79 : Completed cases with adjuvant therapy by age								
	Radiotherapy		Chemotherapy		Hormone Therapy		Total	
Age group	No.	%	No.	%	No.	%	No.	%
0-48	1	100	0	0	0	0	1	100
49	97	62	40	26	107	69	156	100
50-52	955	63	384	25	1028	68	1517	100
53-55	885	68	294	23	892	69	1295	100
56-58	1170	69	380	23	1203	71	1686	100
59-61	1305	73	334	19	1307	73	1796	100
62-64	1155	70	238	14	1206	73	1656	100
65-67	1102	68	207	13	1216	75	1619	100
68-70	1013	64	137	9	1214	76	1592	100
71+	405	60	33	5	532	79	672	100
Total	**8088**	**67**	**2047**	**17**	**8705**	**73**	**11990**	**100**

Table 80 : Adjuvant therapy for cases with complete data																			
	No surgery		Surgery only		Surgery & RT		Surgery & CT		Surgery & HT		Surgery & RT & CT		Surgery & RT & HT		Surgery & CT & HT		Surgery & RT & CT & HT		Total
Region	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	
NEYH	22	2	243	17	109	8	24	2	274	19	44	3	538	38	43	3	132	9	1429
East Midlands	29	2	139	11	149	12	12	1	206	16	39	3	553	44	14	1	121	10	1262
East of England	15	1	138	11	185	15	7	1	149	12	43	4	558	46	23	2	96	8	1214
London	14	1	151	13	118	10	11	1	174	15	50	4	512	43	34	3	132	11	1196
South East Coast	0	0	80	17	37	8	6	1	65	14	17	4	216	45	13	3	47	10	481
South Central	3	0	95	10	78	8	2	0	168	18	28	3	437	46	18	2	119	13	948
South West	1	0	176	13	119	9	9	1	175	13	41	3	643	49	21	2	130	10	1315
West Midlands	12	1	88	9	76	8	7	1	101	11	35	4	520	55	10	1	93	10	942
North West	7	1	144	11	103	8	33	3	232	18	47	4	537	41	46	4	148	11	1297
Wales	19	2	103	13	146	19	11	1	91	12	28	4	280	37	20	3	68	9	766
Northern Ireland	1	1	8	5	12	8	2	1	20	13	8	5	84	53	4	3	19	12	158
Scotland	17	2	124	13	76	8	17	2	216	22	24	2	385	39	35	4	88	9	982
United Kingdom	**140**	**1**	**1489**	**12**	**1208**	**10**	**141**	**1**	**1871**	**16**	**404**	**3**	**5263**	**44**	**281**	**2**	**1193**	**10**	**11990**

Table 81 : Surgery for included cases								
	No surgery		1 operation		>1 operation		Total	
Region	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	24	1	1305	79	331	20	1660	100
East Midlands	29	2	1006	80	228	18	1263	100
East of England	18	1	1087	82	215	16	1320	100
London	18	1	1065	79	265	20	1348	100
South East Coast	0	0	410	79	111	21	521	100
South Central	6	1	893	78	242	21	1141	100
South West	2	0	1143	79	307	21	1452	100
West Midlands	14	1	922	81	207	18	1143	100
North West	10	1	1305	86	204	13	1519	100
Wales	19	2	642	81	136	17	797	100
Northern Ireland	1	1	141	87	21	13	163	100
Scotland	17	1	1098	83	209	16	1324	100
United Kingdom	**158**	**1**	**11017**	**81**	**2476**	**18**	**13651**	**100**

Table 82 : First surgery						
	Diagnostic (no non-operative diagnosis)		Therapeutic		Total	
Region	No.	%	No.	%	No.	%
N East, Yorks & Humber	95	6	1541	94	1636	100
East Midlands	59	5	1175	95	1234	100
East of England	93	7	1209	93	1302	100
London	96	7	1234	93	1330	100
South East Coast	38	7	483	93	521	100
South Central	94	8	1041	92	1135	100
South West	87	6	1363	94	1450	100
West Midlands	59	5	1070	95	1129	100
North West	97	6	1412	94	1509	100
Wales	35	4	743	96	778	100
Northern Ireland	10	6	152	94	162	100
Scotland	63	5	1244	95	1307	100
United Kingdom	**826**	**6**	**12667**	**94**	**13493**	**100**

Table 83 : Surgery for cases with radiotherapy								
	No surgery		1 operation		>1 operation		Total	
Region	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	3	0	701	82	154	18	858	100
East Midlands	1	0	712	83	150	17	863	100
East of England	3	0	792	85	135	15	930	100
London	3	0	706	83	145	17	854	100
South East Coast	0	0	263	79	69	21	332	100
South Central	1	0	583	79	152	21	736	100
South West	0	0	797	80	197	20	994	100
West Midlands	1	0	726	85	129	15	856	100
North West	1	0	843	89	103	11	947	100
Wales	8	2	440	83	83	16	531	100
Northern Ireland	0	0	108	88	15	12	123	100
Scotland	1	0	482	83	96	17	579	100
United Kingdom	**22**	**0**	**7153**	**83**	**1428**	**17**	**8603**	**100**

Table 84 : Surgery for cases with chemotherapy								
	No surgery		1 operation		>1 operation		Total	
Region	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	4	1	215	75	69	24	288	100
East Midlands	5	3	157	82	29	15	191	100
East of England	3	2	134	77	38	22	175	100
London	3	1	213	80	50	19	266	100
South East Coast	0	0	62	72	24	28	86	100
South Central	0	0	141	72	55	28	196	100
South West	0	0	164	78	46	22	210	100
West Midlands	1	1	151	82	32	17	184	100
North West	4	1	250	84	45	15	299	100
Wales	4	3	127	83	22	14	153	100
Northern Ireland	0	0	33	94	2	6	35	100
Scotland	7	3	193	79	43	18	243	100
United Kingdom	**31**	**1**	**1840**	**79**	**455**	**20**	**2326**	**100**

Table 85 : Time from assessment to first diagnostic surgery (cases with no non-operative diagnosis)													
	≤ 14 days		≤ 30 days		≤ 60 days		≤ 90 days		≤ 120 days		≤ 200 days		Median
Region	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	
N East, Yorks & Humber	2	2	43	45	83	87	92	97	94	99	94	99	34
East Midlands	7	12	23	39	48	81	53	90	54	92	59	100	40
East of England	6	6	47	51	85	91	89	96	93	100	93	100	30
London	6	6	34	35	83	86	91	95	95	99	95	99	38
South East Coast	0	0	4	11	25	66	35	92	38	100	38	100	52
South Central	6	6	45	48	90	96	92	98	93	99	94	100	32
South West	1	1	23	26	72	83	79	91	83	95	86	99	40
West Midlands	6	10	21	36	52	88	58	98	59	100	59	100	38
North West	6	6	37	38	84	87	93	96	96	99	96	99	35
Wales	5	14	19	54	33	94	34	97	35	100	35	100	27
Northern Ireland	0	0	6	60	10	100	10	100	10	100	10	100	29
Scotland	8	13	21	33	47	75	60	95	61	97	62	98	41
United Kingdom	**53**	**6**	**323**	**39**	**712**	**86**	**786**	**95**	**811**	**98**	**821**	**99**	**36**

Table 86 : Time from assessment to first therapeutic surgery (cases with non-operative diagnosis)													
	≤ 14 days		≤ 30 days		≤ 60 days		≤ 90 days		≤ 120 days		≤ 200 days		Media
Region	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	n
N East, Yorks & Humber	154	10	959	62	1477	96	1521	99	1528	99	1536	100	27
East Midlands	140	12	667	57	1099	94	1143	97	1149	98	1163	99	28
East of England	97	8	674	56	1130	93	1182	98	1194	99	1206	100	29
London	48	4	504	41	1105	90	1170	95	1185	96	1214	98	34
South East Coast	9	2	102	21	382	79	448	93	463	96	474	98	42
South Central	117	11	673	65	991	95	1024	98	1029	99	1037	100	27
South West	60	4	559	41	1270	93	1325	97	1342	98	1358	100	34
West Midlands	139	13	690	64	1018	95	1059	99	1064	99	1068	100	27
North West	177	13	799	57	1346	95	1390	98	1403	99	1408	100	29
Wales	105	14	514	69	729	98	739	99	742	100	743	100	25
Northern Ireland	54	36	117	77	148	97	152	100	152	100	152	100	21
Scotland	164	13	705	57	1141	92	1199	96	1209	97	1231	99	29
United Kingdom	**1264**	**10**	**6963**	**55**	**11836**	**93**	**12352**	**98**	**12460**	**98**	**12590**	**99**	**29**

Table 87 : Time from final surgery to radiotherapy (excluding cases with chemotherapy)													
	≤ 14 days		≤ 30 days		≤ 60 days		≤ 90 days		≤ 120 days		≤ 200 days		Median
Region	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	
N East, Yorks & Humber	2	0	14	2	165	24	251	37	442	65	667	99	108
East Midlands	2	0	49	7	392	56	643	92	689	98	701	100	58
East of England	1	0	31	4	371	47	638	81	756	96	779	99	62
London	8	1	29	4	329	50	576	87	627	95	657	99	61
South East Coast	1	0	5	2	65	24	119	45	204	77	265	100	95
South Central	0	0	20	3	235	41	472	82	547	94	573	99	65
South West	1	0	15	2	236	29	663	81	776	95	811	99	70
West Midlands	0	0	16	2	289	41	612	87	662	94	685	97	64
North West	1	0	17	2	320	43	586	79	687	92	729	98	67
Wales	1	0	3	1	75	18	323	76	405	95	424	99	75
Northern Ireland	0	0	1	1	27	28	72	75	87	91	95	99	71
Scotland	6	1	16	3	294	63	421	91	452	97	464	100	53
United Kingdom	**23**	**0**	**216**	**3**	**2798**	**40**	**5376**	**78**	**6334**	**91**	**6850**	**99**	**66**

Table 88 : Time from assessment to radiotherapy (excluding cases with chemotherapy)													
	≤ 14 days		≤ 30 days		≤ 60 days		≤ 90 days		≤ 120 days		≤ 200 days		Median
Region	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	
N East, Yorks & Humber	0	0	1	0	24	4	144	21	257	38	636	94	138
East Midlands	0	0	2	0	46	7	331	47	571	81	687	98	92
East of England	0	0	1	0	68	9	347	44	579	73	765	97	96
London	2	0	5	1	30	5	232	35	494	74	628	95	100
South East Coast	0	0	0	0	5	2	37	14	85	32	233	88	142
South Central	0	0	0	0	46	8	239	41	441	76	561	97	98
South West	0	0	1	0	17	2	198	24	536	65	790	96	109
West Midlands	0	0	1	0	48	7	313	44	541	77	670	95	95
North West	0	0	1	0	42	6	299	40	558	75	716	96	102
Wales	0	0	1	0	7	2	122	28	311	72	421	98	103
Northern Ireland	0	0	0	0	8	8	34	35	70	73	95	99	104
Scotland	0	0	5	1	28	6	214	46	364	78	444	95	93
United Kingdom	**2**	**0**	**18**	**0**	**369**	**5**	**2510**	**36**	**4807**	**69**	**6646**	**96**	**102**

Table 89 : Invasive status of cancers with known radiotherapy data										
	Invasive		Micro-invasive		Non-invasive		Unknown		Total	
Region	No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	1175	78	21	1	303	20	3	0	1502	100
East Midlands	1012	80	10	1	236	19	5	0	1263	100
East of England	1035	80	5	0	253	20	0	0	1293	100
London	977	78	10	1	258	21	1	0	1246	100
South East Coast	394	78	3	1	108	21	0	0	505	100
South Central	889	81	7	1	198	18	0	0	1094	100
South West	1109	78	0	0	312	22	2	0	1423	100
West Midlands	890	82	11	1	179	17	0	0	1080	100
North West	1150	80	28	2	257	18	2	0	1437	100
Wales	615	80	3	0	152	20	0	0	770	100
Northern Ireland	127	79	3	2	30	19	0	0	160	100
Scotland	776	78	13	1	205	21	0	0	994	100
United Kingdom	**10149**	**79**	**114**	**1**	**2491**	**20**	**13**	**0**	**12767**	**100**

Table 90 : Treatment of invasive cancers with known radiotherapy data										
	Conservation surgery		Mastectomy		No Surgery		Unknown		Total	
Region	No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	771	66	386	33	18	2	0	0	1175	100
East Midlands	679	67	311	31	22	2	0	0	1012	100
East of England	777	75	242	23	15	1	1	0	1035	100
London	704	72	253	26	12	1	8	1	977	100
South East Coast	297	75	97	25	0	0	0	0	394	100
South Central	661	74	222	25	6	1	0	0	889	100
South West	857	77	250	23	2	0	0	0	1109	100
West Midlands	689	77	188	21	12	1	1	0	890	100
North West	840	73	302	26	8	1	0	0	1150	100
Wales	423	69	175	28	17	3	0	0	615	100
Northern Ireland	109	86	18	14	0	0	0	0	127	100
Scotland	509	66	251	32	14	2	2	0	776	100
United Kingdom	**7316**	**72**	**2695**	**27**	**126**	**1**	**12**	**0**	**10149**	**100**

Table 91 : Radiotherapy for invasive cancers treated by conservation surgery						
	Radiotherapy		No radiotherapy		Total	
Region	No.	%	No.	%	No.	%
N East, Yorks & Humber	663	86	108	14	771	100
East Midlands	666	98	13	2	679	100
East of England	733	94	44	6	777	100
London	644	91	60	9	704	100
South East Coast	271	91	26	9	297	100
South Central	582	88	79	12	661	100
South West	788	92	69	8	857	100
West Midlands	671	97	18	3	689	100
North West	774	92	66	8	840	100
Wales	408	96	15	4	423	100
Northern Ireland	101	93	8	7	109	100
Scotland	434	85	75	15	509	100
United Kingdom	**6735**	**92**	**581**	**8**	**7316**	**100**

Table 92 : Invasive size of invasive cancers treated by conservation surgery without radiotherapy														
	<10mm		10-<15mm		15-<20mm		20-<50mm		50+mm		Unknown		Total	
Region	No	%	No	%	No	%	No	%	No	%	No	%	No	%
N East, Yorks & Humber	34	31	30	28	20	19	23	21	0	0	1	1	108	69
East Midlands	5	38	2	15	4	31	0	0	1	8	1	8	13	62
East of England	10	23	12	27	9	20	10	23	2	5	1	2	44	77
London	23	38	11	18	13	22	12	20	0	0	1	2	60	62
South East Coast	10	38	7	27	6	23	3	12	0	0	0	0	26	62
South Central	42	53	19	24	12	15	5	6	1	1	0	0	79	47
South West	32	46	10	14	10	14	16	23	0	0	1	1	69	54
West Midlands	5	28	5	28	2	11	6	33	0	0	0	0	18	72
North West	23	35	18	27	10	15	12	18	1	2	2	3	66	65
Wales	7	47	3	20	1	7	1	7	0	0	3	20	15	53
Northern Ireland	4	50	0	0	1	13	3	38	0	0	0	0	8	50
Scotland	21	28	23	31	17	23	13	17	0	0	1	1	75	72
United Kingdom	**216**	**37**	**140**	**24**	**105**	**18**	**104**	**18**	**5**	**1**	**11**	**2**	**581**	**63**

Table 93 : Invasive cancers treated by conservation surgery without RT							
		≥20mm		Grade III		Nodal status positive	
Region	Total	No	%	No	%	No	%
North, Yorks & Humber	108	23	21	16	15	17	16
East Midlands	13	1	8	3	23	0	0
East of England	44	12	27	7	16	10	23
London	60	12	20	11	18	6	10
South East Coast	26	3	12	3	12	2	8
South Central	79	6	8	2	3	6	8
South West	69	16	23	6	9	8	12
West Midlands	18	6	33	2	11	2	11
North West	66	13	20	3	5	9	14
Wales	15	1	7	0	0	1	7
Northern Ireland	8	3	38	2	25	1	13
Scotland	75	13	17	19	25	13	17
United Kingdom	**581**	**109**	**19**	**74**	**13**	**75**	**13**

Table 94 : Radiotherapy for non-invasive cancers treated by conservation surgery						
	Radiotherapy		No radiotherapy		Total	
Region	No.	%	No.	%	No.	%
N East, Yorks & Humber	92	47	104	53	196	100
East Midlands	82	59	57	41	139	100
East of England	119	68	57	32	176	100
London	104	58	75	42	179	100
South East Coast	24	31	53	69	77	100
South Central	64	45	79	55	143	100
South West	105	43	138	57	243	100
West Midlands	82	65	45	35	127	100
North West	81	45	99	55	180	100
Wales	59	58	42	42	101	100
Northern Ireland	12	60	8	40	20	100
Scotland	81	59	57	41	138	100
United Kingdom	**905**	**53**	**814**	**47**	**1719**	**100**

Table 95 : Cytonuclear grade of non-invasive cancers treated by conservation surgery without radiotherapy										
	High		Other		Not assessable		Unknown		Total	
Region	No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	19	18	75	72	8	8	2	2	104	100
East Midlands	18	32	32	56	4	7	3	5	57	100
East of England	16	28	34	60	4	7	3	5	57	100
London	16	21	49	65	3	4	7	9	75	100
South East Coast	16	30	29	55	5	9	3	6	53	100
South Central	30	38	44	56	0	0	5	6	79	100
South West	50	36	74	54	8	6	6	4	138	100
West Midlands	14	31	29	64	0	0	2	4	45	100
North West	31	31	64	65	1	1	3	3	99	100
Wales	4	10	32	76	5	12	1	2	42	100
Northern Ireland	5	63	3	38	0	0	0	0	8	100
Scotland	12	21	32	56	1	2	12	21	57	100
United Kingdom	**231**	**28**	**497**	**61**	**39**	**5**	**47**	**6**	**814**	**100**

Table 96 : Size of non-invasive cancers treated by conservation surgery without radiotherapy												
	<15mm		15-<30mm		30+mm		Not assessable		Unknown		Total	
Region	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	59	57	23	22	10	10	0	0	12	12	104	100
East Midlands	38	67	10	18	2	4	4	7	3	5	57	100
East of England	37	65	9	16	3	5	6	11	2	4	57	100
London	41	55	11	15	5	7	1	1	17	23	75	100
South East Coast	36	68	5	9	3	6	5	9	4	8	53	100
South Central	42	53	18	23	8	10	3	4	8	10	79	100
South West	93	67	18	13	7	5	12	9	8	6	138	100
West Midlands	31	69	5	11	4	9	0	0	5	11	45	100
North West	53	54	25	25	7	7	4	4	10	10	99	100
Wales	24	57	2	5	0	0	6	14	10	24	42	100
Northern Ireland	6	75	1	13	0	0	0	0	1	13	8	100
Scotland	35	61	12	21	3	5	0	0	7	12	57	100
United Kingdom	**495**	**61**	**139**	**17**	**52**	**6**	**41**	**5**	**87**	**11**	**814**	**100**

Table 97 : Invasive status, nodal status and ER status of 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.	%
N East, Yorks & Humber	110	7	40	3	1110	70	23	1	304	19	3	0	1590	100
East Midlands	73	6	22	2	917	73	10	1	236	19	5	0	1263	100
East of England	59	5	23	2	951	73	5	0	257	20	0	0	1295	100
London	64	5	29	2	934	71	11	1	277	21	1	0	1316	100
South East Coast	33	7	14	3	349	69	3	1	105	21	0	0	504	100
South Central	63	6	19	2	833	74	8	1	200	18	0	0	1123	100
South West	74	5	24	2	999	71	0	0	309	22	2	0	1408	100
West Midlands	49	5	20	2	765	75	10	1	170	17	0	0	1014	100
North West	87	6	39	3	970	70	27	2	256	19	4	0	1383	100
Wales	46	6	20	3	570	72	3	0	152	19	0	0	791	100
Northern Ireland	12	7	1	1	117	72	3	2	30	18	0	0	163	100
Scotland	68	5	26	2	939	73	14	1	245	19	0	0	1292	100
United Kingdom	**738**	**6**	**277**	**2**	**9454**	**72**	**117**	**1**	**2541**	**19**	**15**	**0**	**13142**	**100**

Table 98 : Chemotherapy for ER negative node positive invasive cancers						
	Chemotherapy		No chemotherapy		Total	
Region	No.	%	No.	%	No.	%
N East, Yorks & Humber	31	78	9	23	40	100
East Midlands	19	86	3	14	22	100
East of England	19	83	4	17	23	100
London	25	86	4	14	29	100
South East Coast	11	79	3	21	14	100
South Central	16	84	3	16	19	100
South West	20	83	4	17	24	100
West Midlands	18	90	2	10	20	100
North West	34	87	5	13	39	100
Wales	20	100	0	0	20	100
Northern Ireland	1	100	0	0	1	100
Scotland	22	85	4	15	26	100
United Kingdom	**236**	**85**	**41**	**15**	**277**	**100**

Table 99 : Chemotherapy for ER negative node negative invasive cancers						
	Chemotherapy		No chemotherapy		Total	
Region	No.	%	No.	%	No.	%
N East, Yorks & Humber	46	42	64	58	110	100
East Midlands	28	38	45	62	73	100
East of England	26	44	33	56	59	100
London	37	58	27	42	64	100
South East Coast	10	30	23	70	33	100
South Central	26	41	37	59	63	100
South West	26	35	48	65	74	100
West Midlands	26	53	23	47	49	100
North West	39	45	48	55	87	100
Wales	23	50	23	50	46	100
Northern Ireland	7	58	5	42	12	100
Scotland	37	54	31	46	68	100
United Kingdom	**331**	**45**	**407**	**55**	**738**	**100**

Table 100 : Grade of ER negative node negative invasive cancers given chemotherapy										
	Grade I		Grade II		Grade III		Unknown		Total	
Region	No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	0	0	5	11	41	89	0	0	46	100
East Midlands	0	0	0	0	28	100	0	0	28	100
East of England	0	0	2	8	23	88	1	4	26	100
London	0	0	5	14	32	86	0	0	37	100
South East Coast	0	0	2	20	7	70	1	10	10	100
South Central	0	0	5	19	21	81	0	0	26	100
South West	1	4	1	4	23	88	1	4	26	100
West Midlands	0	0	3	12	23	88	0	0	26	100
North West	1	3	7	18	30	77	1	3	39	100
Wales	0	0	2	9	21	91	0	0	23	100
Northern Ireland	0	0	1	14	6	86	0	0	7	100
Scotland	1	3	6	16	30	81	0	0	37	100
United Kingdom	**3**	**1**	**39**	**12**	**285**	**86**	**4**	**1**	**331**	**100**

Table 101 : ER status of all cases with complete hormone therapy data								
	Positive		Negative		Unknown		Total	
Region	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	1222	76	187	12	191	12	1600	100
East Midlands	992	79	128	10	142	11	1262	100
East of England	949	76	104	8	192	15	1245	100
London	993	77	156	12	141	11	1290	100
South East Coast	377	76	57	11	64	13	498	100
South Central	803	80	100	10	97	10	1000	100
South West	1107	81	148	11	105	8	1360	100
West Midlands	847	84	92	9	68	7	1007	100
North West	1129	82	185	13	70	5	1384	100
Wales	580	73	82	10	132	17	794	100
Northern Ireland	132	82	23	14	6	4	161	100
Scotland	1086	83	134	10	91	7	1311	100
United Kingdom	**10214**	**79**	**1396**	**11**	**1302**	**10**	**12912**	**100**

Table 102 : Invasive status of ER positive cases with known hormone therapy data										
	Invasive		Micro-invasive		Non-invasive		Unknown		Total	
Region	No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	1131	93	3	0	86	7	2	0	1222	100
East Midlands	907	91	2	0	82	8	1	0	992	100
East of England	894	94	0	0	55	6	0	0	949	100
London	879	89	3	0	110	11	1	0	993	100
South East Coast	342	91	1	0	34	9	0	0	377	100
South Central	742	92	4	0	57	7	0	0	803	100
South West	949	86	0	0	157	14	1	0	1107	100
West Midlands	761	90	4	0	82	10	0	0	847	100
North West	953	84	12	1	163	14	1	0	1129	100
Wales	554	96	2	0	24	4	0	0	580	100
Northern Ireland	116	88	0	0	16	12	0	0	132	100
Scotland	957	88	7	1	122	11	0	0	1086	100
United Kingdom	**9182**	**90**	**38**	**0**	**988**	**10**	**6**	**0**	**10214**	**100**

Table 103 : Hormone therapy for ER positive invasive cancers						
	Hormone therapy		No hormone therapy		Total	
Region	No.	%	No.	%	No.	%
N East, Yorks & Humber	1078	95	53	5	1131	100
East Midlands	817	90	90	10	907	100
East of England	823	92	71	8	894	100
London	837	95	42	5	879	100
South East Coast	335	98	7	2	342	100
South Central	729	98	13	2	742	100
South West	915	96	34	4	949	100
West Midlands	747	98	14	2	761	100
North West	894	94	59	6	953	100
Wales	477	86	77	14	554	100
Northern Ireland	114	98	2	2	116	100
Scotland	950	99	7	1	957	100
United Kingdom	**8713**	**95**	**469**	**5**	**9182**	**100**

Table 104 : ER positive invasive cancers without hormone therapy							
	Total	<15mm		Grade I or II		Node negative	
Region	cases	No.	%	No.	%	No.	%
N East, Yorks & Humber	53	25	47	45	85	35	66
East Midlands	90	75	83	83	92	84	93
East of England	71	52	73	59	83	60	85
London	42	25	60	34	81	33	79
South East Coast	7	7	100	5	71	6	86
South Central	13	9	69	11	85	12	92
South West	34	24	71	27	79	28	82
West Midlands	14	8	57	10	71	9	64
North West	59	41	69	50	85	49	83
Wales	77	67	87	71	92	76	99
Northern Ireland	2	0	0	1	50	0	0
Scotland	7	5	71	4	57	4	57
United Kingdom	**469**	**338**	**72**	**400**	**85**	**396**	**84**

Table 105 : Hormone therapy for ER negative, PgR positive invasive cancers						
	Hormone therapy		No hormone therapy		Total	
Region	No.	%	No.	%	No.	%
N East, Yorks & Humber	6	75	2	25	8	100
East Midlands	2	25	6	75	8	100
East of England	1	33	2	67	3	100
London	4	80	1	20	5	100
South East Coast	7	78	2	22	9	100
South Central	3	75	1	25	4	100
South West	1	50	1	50	2	100
West Midlands	0	0	1	100	1	100
North West	7	58	5	42	12	100
Wales	0	0	1	100	1	100
Northern Ireland	1	100	0	0	1	100
Scotland	2	25	6	75	8	100
United Kingdom	**34**	**55**	**28**	**45**	**62**	**100**

Table 106 : Hormone therapy for all ER negative cancers						
	Hormone therapy		No hormone therapy		Total	
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**
N East, Yorks & Humber	16	9	171	91	187	100
East Midlands	5	4	123	96	128	100
East of England	4	4	100	96	104	100
London	20	13	136	87	156	100
South East Coast	9	16	48	84	57	100
South Central	10	10	90	90	100	100
South West	11	7	137	93	148	100
West Midlands	2	2	90	98	92	100
North West	17	9	168	91	185	100
Wales	0	0	82	100	82	100
Northern Ireland	1	4	22	96	23	100
Scotland	4	3	130	97	134	100
United Kingdom	**99**	**7**	**1297**	**93**	**1396**	**100**

Table 107 : ER status for non-invasive cancers with hormone therapy								
	ER positive		ER negative		ER unknown/ not done		Total*	
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
N East, Yorks & Humber	32	10	1	0	3	1	36	12
East Midlands	67	28	0	0	20	8	87	37
East of England	18	7	1	0	3	1	22	9
London	50	18	7	3	4	1	61	22
South East Coast	10	9	1	1	1	1	12	11
South Central	36	18	1	0	0	0	37	18
South West	67	21	3	1	2	1	72	23
West Midlands	36	20	1	1	1	1	38	21
North West	114	42	3	1	1	0	118	44
Wales	16	11	0	0	1	1	17	11
Northern Ireland	13	43	0	0	1	3	14	47
Scotland	26	11	1	0	3	1	30	12
United Kingdom	**485**	**19**	**19**	**1**	**40**	**2**	**544**	**21**

*Number of non-invasive cancers with hormone therapy as a percentage of the number of non-invasive cancers

Table 108 : Hormone therapy for ER positive non-invasive cancers						
	Hormone therapy		No hormone therapy		Total	
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**
N East, Yorks & Humber	32	37	54	63	86	100
East Midlands	67	82	15	18	82	100
East of England	18	33	37	67	55	100
London	50	45	60	55	110	100
South East Coast	10	29	24	71	34	100
South Central	36	63	21	37	57	100
South West	67	43	90	57	157	100
West Midlands	36	44	46	56	82	100
North West	114	70	49	30	163	100
Wales	16	67	8	33	24	100
Northern Ireland	13	81	3	19	16	100
Scotland	26	21	96	79	122	100
United Kingdom	**485**	**49**	**503**	**51**	**988**	**100**

Table 109 : Chemotherapy for ER and PgR negative invasive cancers						
	Chemotherapy		No Chemotherapy		Total	
Region	No.	%	No.	%	No.	%
N East, Yorks & Humber	66	52	61	48	127	100
East Midlands	27	49	28	51	55	100
East of England	30	58	22	42	52	100
London	61	64	35	36	96	100
South East Coast	21	54	18	46	39	100
South Central	32	48	34	52	66	100
South West	35	49	36	51	71	100
West Midlands	40	63	24	38	64	100
North West	64	59	44	41	108	100
Wales	34	63	20	37	54	100
Northern Ireland	4	44	5	56	9	100
Scotland	55	62	34	38	89	100
United Kingdom	**469**	**57**	**361**	**43**	**830**	**100**

Table 110 : ER and PgR negative invasive cancers without CT									
		20+mm		Grade III		Node positive		HER2 positive	
Region	Total cases	No.	%	No.	%	No.	%	No.	%
North, Yorks & Humber	61	13	21	26	43	9	15	11	18
East Midlands	28	2	7	11	39	2	7	3	11
East of England	22	3	14	12	55	3	14	3	14
London	35	8	23	9	26	4	11	7	20
South East Coast	18	1	6	10	56	3	17	3	17
South Central	34	5	15	15	44	2	6	10	29
South West	36	4	11	20	56	1	3	7	19
West Midlands	24	6	25	12	50	2	8	3	13
North West	44	12	27	20	45	4	9	10	23
Wales	20	1	5	8	40	0	0	3	15
Northern Ireland	5	0	0	2	40	0	0	1	20
Scotland	34	14	41	18	53	4	12	9	26
United Kingdom	**361**	**69**	**19**	**163**	**45**	**34**	**9**	**70**	**19**

Table 111 : Chemotherapy for HER-2 positive invasive cancers						
	Chemotherapy		No Chemotherapy		Total	
Region	No.	%	No.	%	No.	No.
N East, Yorks & Humber	58	62	35	38	93	100
East Midlands	23	70	10	30	33	100
East of England	31	52	29	48	60	100
London	57	49	59	51	116	100
South East Coast	13	43	17	57	30	100
South Central	42	44	54	56	96	100
South West	47	34	93	66	140	100
West Midlands	31	62	19	38	50	100
North West	53	51	50	49	103	100
Wales	30	75	10	25	40	100
Northern Ireland	2	40	3	60	5	100
Scotland	70	44	89	56	159	100
United Kingdom	**457**	**49**	**468**	**51**	**925**	**100**

Table 112 : HER2 positive invasive cancers without CT							
		20+mm		Grade III		Node positive	
Region	Total cases	No.	%	No.	%	No.	%
North, Yorks & Humber	35	40	114	15	43	6	17
East Midlands	10	15	150	4	40	2	20
East of England	29	20	69	9	31	3	10
London	59	39	66	11	19	4	7
South East Coast	17	14	82	9	53	5	29
South Central	54	38	70	21	39	9	17
South West	93	31	33	17	18	11	12
West Midlands	19	23	121	9	47	2	11
North West	50	42	84	12	24	7	14
Wales	10	15	150	4	40	0	0
Northern Ireland	3	0	0	2	67	0	0
Scotland	89	51	57	32	36	16	18
United Kingdom	**468**	**328**	**70**	**145**	**31**	**65**	**14**

Table 113 : NPI groups of HER2 positive invasive cancers without CT											
		EPG		GPG		MPG1		MPG2		PGP	
Region	Total	No	%	No	%	No	%	No	%	No	%
North, Yorks & Humber	35	2	6	15	43	11	31	3	9	3	9
East Midlands	10	0	0	5	50	3	30	0	0	2	20
East of England	29	5	17	10	34	9	31	3	10	1	3
London	59	10	17	22	37	13	22	2	3	2	3
South East Coast	17	2	12	3	18	8	47	3	18	1	6
South Central	54	4	7	20	37	17	31	7	13	3	6
South West	93	26	28	40	43	18	19	6	6	2	2
West Midlands	19	1	5	6	32	7	37	4	21	1	5
North West	50	8	16	18	36	13	26	7	14	2	4
Wales	10	0	0	4	40	4	40	0	0	0	0
Northern Ireland	3	0	0	1	33	2	67	0	0	0	0
Scotland	89	16	18	24	27	34	38	9	10	5	6
United Kingdom	**468**	**74**	**16**	**168**	**36**	**139**	**30**	**44**	**9**	**22**	**5**

APPENDIX G: SURVIVAL ANALYSIS DATA TABLES (114-122)

DATA OBTAINED FROM THE SURVIVAL AUDIT OF SCREEN DETECTED BREAST CANCERS FOR CANCERS DIAGNOSED BETWEEN 1 JANUARY 1990 AND 31 DECEMBER 1991

Table 114 : Cause of death of eligible invasive cancers with death before 31/12/2006

Region	Breast Cancer		Other cancer		Non-cancer		Not Collected		Unknown		Total deaths		Total cancers
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	
N East, Yorks & Humber	93	25	48	13	122	32	18	5	96	25	377	37	1014
East Midlands	63	31	29	14	67	33	0	0	47	23	206	37	560
East of England	157	50	48	15	76	24	0	0	32	10	313	38	826
London	152	52	48	17	89	31	1	0	0	0	290	36	815
South East Coast	120	60	29	14	47	23	4	2	1	0	201	28	708
South Central	114	49	33	14	67	29	11	5	6	3	231	36	633
South West	131	60	22	10	46	21	4	2	14	6	217	30	713
West Midlands	158	54	50	17	72	25	8	3	3	1	291	37	791
North West	139	51	47	17	74	27	0	0	10	4	270	33	821
Wales	27	42	16	25	22	34	0	0	0	0	65	29	227
United Kingdom	**1154**	**47**	**370**	**15**	**682**	**28**	**46**	**2**	**209**	**8**	**2461**	**35**	**7108**

Table 115 : Cause of death of eligible micro-invasive cancers with death before 31/12/2006

Region	Breast Cancer		Other cancer		Non-cancer		Not Collected		Unknown		Total deaths		Total cancers
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	
N East, Yorks & Humber	0	0	0	0	0	0	1	100	0	0	1	11	9
East Midlands	1	50	0	0	0	0	0	0	1	50	2	18	11
East of England	1	14	2	29	4	57	0	0	0	0	7	29	24
London	0	0	1	50	1	50	0	0	0	0	2	29	7
South East Coast	1	25	0	0	3	75	0	0	0	0	4	24	17
South Central	3	75	0	0	1	25	0	0	0	0	4	33	12
South West	5	25	4	20	10	50	0	0	1	5	20	20	98
West Midlands	0	0	0	0	2	100	0	0	0	0	2	10	21
North West	0	0	1	33	2	67	0	0	0	0	3	50	6
Wales	0	0	0	0	1	100	0	0	0	0	1	33	3
United Kingdom	**11**	**24**	**8**	**17**	**24**	**52**	**1**	**2**	**2**	**4**	**46**	**22**	**208**

Table 116 : Cause of death of eligible non-invasive cancers with death before 31/12/2006

Region	Breast Cancer		Other cancer		Non-cancer		Not Collected		Unknown		Total deaths		Total cancers
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	
N East, Yorks & Humber	2	7	6	22	11	41	1	4	7	26	27	18	146
East Midlands	4	20	3	15	9	45	0	0	4	20	20	25	81
East of England	16	34	10	21	17	36	0	0	4	9	47	27	173
London	13	43	9	30	8	27	0	0	0	0	30	18	168
South East Coast	10	29	17	49	8	23	0	0	0	0	35	23	152
South Central	10	28	7	19	16	44	3	8	0	0	36	23	157
South West	8	40	4	20	8	40	0	0	0	0	20	27	74
West Midlands	3	20	5	33	5	33	2	13	0	0	15	15	102
North West	8	40	4	20	7	35	0	0	1	5	20	14	145
Wales	2	25	3	38	3	38	0	0	0	0	8	16	51
United Kingdom	**76**	**29**	**68**	**26**	**92**	**36**	**6**	**2**	**16**	**6**	**258**	**21**	**1249**

Table 117 : Relative survival by region – primary invasive cancers only			
Region	**5 year**	**10 year**	**15 year**
N East, Yorks & Humber	91.1 (88.9,93.3)	84.2 (81.1,87.3)	81.5 (77.7,85.4)
East Midlands	92.6 (89.7,95.5)	89.4 (85.5,93.4)	84.7 (79.5,89.9)
East of England	92.6 (90.2,95.1)	87.4 (83.9,90.8)	85.2 (80.8,89.6)
London	95.0 (92.8,97.1)	88.5 (85.3,91.8)	84.9 (80.6,89.1)
South East Coast	96.1 (93.8,98.3)	94.1 (90.9,97.3)	95.2 (90.9,99.5)
South Central	93.1 (90.4,95.7)	87.6 (83.9,91.4)	83.7 (78.9,88.5)
South West	95.6 (93.3,97.8)	92.1 (88.8,95.5)	92.4 (88.0,96.8)
West Midlands	92.1 (89.7,94.5)	86.7 (83.3,90.0)	82.4 (78.2,86.7)
North West	94.7 (92.5,96.8)	89.0 (85.7,92.2)	87.6 (83.5,91.8)
Wales	96.3 (92.4,100.2)	96.1 (90.6,101.5)	92.3 (84.5,100.0)
United Kingdom	**93.6 (92.9,94.4)**	**88.8 (87.6,89.9)**	**86.3 (84.9,87.8)**

Table 118 : Relative survival by age for primary invasive cancers			
Age	**5 year**	**10 year**	**15 year**
<50	85.8 (76.1,95.4)	78.8 (67.1,90.5)	80.1 (67.6,92.5)
50-52	91.7 (89.6,93.8)	87.3 (84.7,90.0)	83.4 (80.1,86.6)
53-55	92.3 (90.4,94.2)	87.5 (84.9,90.0)	84.3 (81.1,87.4)
56-58	91.9 (90.1,93.7)	86.4 (83.9,88.9)	86.1 (83.0,89.1)
59-61	94.7 (93.2,96.3)	88.8 (86.4,91.1)	85.8 (82.8,88.9)
62-64	94.4 (92.8,96.1)	91.0 (88.6,93.5)	88.6 (85.3,91.9)
65+	100.9 (97.7,104.1)	96.3 (90.6,102.1)	97.9 (89.4,106.3)
All invasive cancers	**93.6 (92.9,94.4)**	**88.8 (87.6,89.9)**	**86.3 (84.9,87.8)**

Table 119 : Relative survival by invasive size for primary invasive cancers			
Size	**5 year**	**10 year**	**15 year**
<10mm	97.6 (96.1,99.1)	94.2 (91.9,96.5)	94.6 (91.5,97.6)
10-<20mm	96.7 (95.6,97.7)	94.0 (92.4,95.5)	91.1 (89.0,93.2)
20-<49mm	88.3 (86.5,90.1)	79.0 (76.6,81.4)	74.7 (71.8,77.7)
50+mm	79.5 (71.6,87.4)	67.9 (58.1,77.6)	61.2 (49.9,72.5)
Unknown	89.3 (86.5,92.2)	84.7 (80.9,88.4)	85.0 (80.4,89.6)
All invasive cancers	**93.6 (92.9,94.4)**	**88.8 (87.6,89.9)**	**86.3 (84.9,87.8)**

Table 120 : Relative survival by grade for primary invasive cancers			
Grade	**5 year**	**10 year**	**15 year**
I	99.5 (98.4,100.7)	98.7 (96.8,100.6)	98.0 (95.3,100.6)
II	94.4 (93.0,95.7)	88.1 (86.1,90.2)	83.2 (80.6,85.9)
III	79.4 (76.3,82.6)	71.6 (67.8,75.5)	68.9 (64.5,73.4)
Not assessable	92.8 (89.5,96.0)	88.9 (84.3,93.4)	86.2 (80.3,92.1)
Unknown	93.9 (92.5,95.4)	88.2 (86.1,90.3)	87.3 (84.6,89.9)
All invasive cancers	**93.6 (92.9,94.4)**	**88.8 (87.6,89.9)**	**86.3 (84.9,87.8)**

Table 121 : Relative survival by nodal status for primary invasive cancers			
Nodal status	**5 year**	**10 year**	**15 year**
Positive	80.7 (78.1,83.4)	69.9 (66.6,73.2)	64.2 (60.4,68.0)
Negative	97.5 (96.4,98.6)	94.5 (92.8,96.2)	93.2 (90.9,95.6)
Unknown	95.1 (94.1,96.2)	90.9 (89.4,92.4)	88.8 (86.8,90.8)
All invasive cancers	**93.6 (92.9,94.4)**	**88.8 (87.6,89.9)**	**86.3 (84.9,87.8)**

Table 122 : Relative survival by NPI prognostic group for primary invasive cancers			
NPI group	**5 year**	**10 year**	**15 year**
EPG	102.1 (100.7,103.6)	101.1 (98.2,104.1)	101.9 (97.6,106.3)
GPG	98.2 (96.4,100.1)	94.6 (91.5,97.6)	91.5 (87.3,95.6)
MPG1	93.3 (90.5,96.1)	88.3 (84.4,92.2)	83.7 (78.6,88.8)
MPG2	79.9 (74.8,85.1)	71.0 (64.7,77.2)	67.6 (60.3,74.9)
PPG	55.8 (47.9,63.6)	37.3 (29.3,45.2)	34.4 (26.0,42.9)
Unknown	94.3 (93.4,95.2)	89.6 (88.2,90.9)	87.3 (85.5,89.0)
All invasive cancers	**93.6 (92.9,94.4)**	**88.8 (87.6,89.9)**	**86.3 (84.9,87.8)**