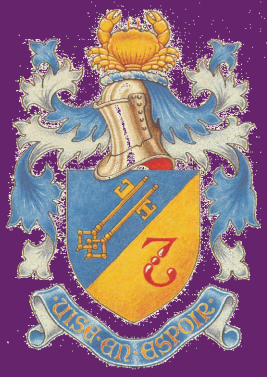

NHS

Cancer Screening Programmes

NHS BREAST SCREENING PROGRAMME

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ASSOCIATION OF BREAST SURGERY AT BASO

AN AUDIT OF SCREEN DETECTED BREAST CANCERS FOR THE YEAR OF SCREENING APRIL 2005 TO MARCH 2006

DISTRIBUTED AT THE
ASSOCIATION OF BREAST SURGERY AT BASO CONFERENCE

23 rd MAY 2007

NATIONAL MOTORCYCLE MUSEUM, BIRMINGHAM

West Midlands
Cancer Intelligence Unit

Cancer Screening Programmes

West Midlands
Cancer Intelligence Unit

FOREWORDS

This year's audit reports on almost two million women screened across the UK and in whom almost 16,000 breast cancers were detected. The audit has been running reliably across the country since 1996/97 and reflects many changes over time. We see the influx of older women, the demographic change as the post war baby boom hits the screening programme, the introduction of two view mammography and improvements in the technology used. But the audit itself has had a tremendous effect. Surgeons have been able to look at their data and examine them critically in comparison with national and regional trends. This has influenced their practice and, over time, improved the care of thousands of women. The breast screening community is rightly proud of this audit and the breast surgeons have certainly made an outstanding contribution to surgical audit in general. The challenge now is to keep the momentum and see the audit continue to influence practice.

Julietta Patnick CBE
Director for the NHS Cancer Screening Programmes
April 2007

Once again it is my pleasure to present the results, your results, of the NHSBSP and ABS at BASO screening audit for 2005/06. Thank you for submitting the data. I hope you will agree that the results justify the efforts involved.

In this year's report, not only have we included the standard data items and analyses to which you have grown accustomed, but we have also interrogated the data to gain a greater insight into some particularly pertinent areas. I would call your attention to chapter 5; *Lymph Node Status, Invasive Grade and NPI*. Within this you will see details on the level of application of sentinel lymph node biopsy within the NHSBSP and an interesting insight into the varying methodologies being adopted across the UK. This area will undoubtedly remain a subject for continuing review in future audits. Likewise the number of repeat operations, which is fully explored in chapter 7; *Number and Sequence of Therapeutic Operations*.

We propose to test the hypotheses generated by the data with you during the Motorcycle Museum meeting on the 23rd May 2007. Thereafter we will tell what really happened! I am delighted that Michael Kerin is, once again, coming over from Galway to act as our facilitator; a role he fills with great distinction.

It feels appropriate that, as this report contains data from 10 year's worth of this excellent audit, it is time to introduce new blood into the audit committee. I would like to take this opportunity to thank James Bristol, Paul Sauven and Mark Kissin for their excellent contributions to the development of the audit over the years. A new successor to the chair of the audit committee is being sought currently and I hope to be able to provide you will details of my successor at the meeting on the 23rd May 2007. I hope you will show him or her the same level of support that I have enjoyed during my tenure as chair.

Finally, all that is left is to express my thanks to the industry of the West Midlands Cancer Intelligence Unit for transforming the data set into the most formidable collection of information on surgical screening in the world.

Hugh Bishop, President of the ABS at BASO, April 2007

ACKNOWLEDGEMENTS

The 2005/06 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.

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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 2005/06 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 2005/06 audit of screen detected breast cancers.

CONTENTS

INTRODUCTION

AIMS AND OBJECTIVES

The 2005/06 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) surgical activity in the period 1 April 2005 to 31 March 2006. The audit was designed to assess surgical performance by comparison of data with as many as possible of the surgical Quality Assurance (QA) standards recommended by the UK NHS Breast Screening Programme. These include the standards set in the following publications:

Quality Assurance Guidelines for Surgeons in Breast Cancer Screening
NHSBSP Publication No. 20 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 Breast Audit 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 surgical screening activity in the 2005/06 screening year. The cohort of women included in this period was selected to be identical to that included in the statistical KC62 reports for 2005/06, 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 2004 to 31 March 2005 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 2004/05 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 breast cancer. Details of the women with screen detected breast cancer diagnosed between 1 April 2000 and 31 March 2001 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 March 2006.

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

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 surgical 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 surgical data collection officers. For those screening services supported by the National Breast Screening System a set of standard analytical co-writer reports was designed to allow the audit data to be retrieved from screening computer systems. These reports were created by Mrs Margot Wheaton and were available to all regions. Data were collated on a regional basis by QA reference centres under the direction of the surgical QA co-ordinators, QA directors and QA co-ordinators and submitted to the West Midlands QA Reference Centre for collation and evaluation.

Obtaining Complete and Valid Audit Data

Ensuring that audit data were supplied in a consistent format was essential to the validation process. The West Midlands QA Reference Centre 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 Audit 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 surgical activity in the UK NHSBSP. National data were evaluated in comparison to current QA standards where these were available. Commentary and recommendations have been made by the NHSBSP and ABS at BASO Breast Audit Group.

Publication of Audit Data

The ABS at BASO 2005/06 audit of screen detected breast cancers is published as a booklet with financial assistance from NHSBSP National Office and is distributed at the annual ABS at BASO annual meeting on 23 May 2007.

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 2005 to March 2006", NHSBSP, ABS at BASO.*

USING THE AUDIT DATA TO IMPROVE PERFORMANCE

Recommended uses of the NHSBSP and ABS at BASO breast 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 2005/06 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 2005/06 AUDIT

The map below shows the eight English NHS regions, Wales, Scotland and Northern Ireland for the boundaries revised on 1 April 2006. 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

1,942,449 women were screened by the UK NHSBSP in England, Wales, Northern Ireland and Scotland between 1 April 2005 and 31 March 2006. 15,944 cancers were detected in women of all ages. This equates to a cancer detection rate of 8.2 cancers per 1,000 women screened.

66% of women with a screen detected breast cancer were aged between 50 and 64 when they were invited for the screening appointment leading to their diagnosis compared with 72% in 2004/05. 27% of screen detected breast cancers were detected in women aged 65-70 compared with 21% in this age group in 2004/05 and 18% in 2003/04.

NON-OPERATIVE DIAGNOSIS

In 2005/06, 94% of cancers detected in the UK NHSBSP were diagnosed non-operatively. All regions met the 90% target. The non-operative diagnosis rates for invasive and non-invasive cancers were 97% and 81% respectively. 88 screening units met or exceeded the overall non-operative diagnosis rate target of 90%. This is the second year that all screening units met the 80% minimum standard.

In the UK as a whole, the overall non-operative diagnosis rate has been either 93% or 94% for the last 3 years. The proportion of cancers diagnosed by C5 cytology alone fell from 7% in 2004/05 to 5% in 2005/06. For non-invasive cancers, in no region did 90% of cancers have a non-operative diagnosis and in 4 regions less than 80% of non-invasive cancers were diagnosed non-operatively. The proportion of non-invasive cancers without a non-operative diagnosis varied from 25% in South Central to 12% in Wales.

For 22% of cancers with a B5a (Non-invasive) non-operative diagnosis, invasive disease was found at surgery. This varied from 11% in North West to 27% in South East Coast. For units which had 15 or more cancers diagnosed as B5a (Non-invasive) by core biopsy, the proportion of B5a (Non-invasive) cancers found to be invasive after surgery varied from 0% in 4 units, which had 16 to 53 B5a (Non-invasive) cases, to 56% in one unit which had 16 B5a cases. North West has a relatively high proportion of cancers found to be micro-invasive following a B5a (non-invasive) core biopsy. The regional QA reference centre should audit these cases to ascertain if they are localised to one unit. 60 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. 96% of 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. 16 screening units failed to achieve the 80% non-operative diagnosis minimum standard at one visit. Regional QA reference centres should liaise with their screening units in order to clarify their policies for recording visits to assessment clinics, so that more definitive data are available for this important area in future audits.

DIAGNOSTIC OPEN BIOPSIES

In the UK as a whole, 2,791 diagnostic open biopsies were performed in 2005/06. Of these 66% were benign and 34% were malignant. The benign open biopsy rate was 0.95 per 1,000 women screened in 2005/06. The malignant open biopsy rate has fallen from 2.04 per 1,000 women screened in 1996/97 to 0.49 per 1,000 women screened in 2005/06 as the non-operative diagnosis rate has increased from 63% to 94%. In the UK as a whole, there were 7 false positive cytology cases and 32 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.

26 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. 19 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 30 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. 41% of invasive cancers and 35% of non-invasive cancers diagnosed by malignant open biopsy following cytology or core biopsy performed during the assessment process had C4 cytology or B4 core biopsy indicating suspicion of malignant disease. Regional QA reference centres in East of England and South West 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, 68% of non-invasive and micro-invasive cancers were treated with conservation surgery, varying from 59% in East Midlands to 77% in South West. The completeness of grade and size data has improved since 2000/01, with only 8% of cases having an unknown grade and/or size, 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. 245 potentially large high-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 12% and 50% in individual screening units. 82% of 50+mm invasive cancers were treated with mastectomy compared with 19% of small (<15mm) invasive cancers. In most regions there was a clear variation in mastectomy rate with tumour size, but in South Central and Scotland, there was relatively little difference in the mastectomy rates for cancers with diameters below 20mm. London and South West had relatively low mastectomy rates for cancers with invasive size 50mm or above with only 56% and 67% of cancers respectively treated with mastectomy compared to 82% 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 size was not provided for 6% invasive cancers. 222 of the cancers without a whole size were in South Central, 174 were in London and 116 were in North East Yorkshire & Humber. The QA reference centres in these regions should ascertain why these important data were not available from their screening units.

Only 14% of cancers with whole size <15mm were treated with mastectomy compared with 19% of cancers with invasive size <15mm. These data suggest that the presence of *in situ* disease accounts for a proportion of the mastectomies performed on tumours with invasive size <15mm. 12% of cancers treated with mastectomy were recorded as having immediate reconstruction. Of these cancers, 274 (55%) were invasive, 11 (2%) were micro-invasive, and 214 (43%) were non-invasive.

8.2% of invasive cancers treated with mastectomy were recorded as having immediate reconstruction compared with 22.3% of micro-invasive and non-invasive cancers treated with mastectomy. In a unit from the West Midlands, 41% of the small cancers with whole size <15mm had a mastectomy. Only 2 of these cases (7%) had immediate reconstruction. There were 3 units from other regions which had a higher than 30% mastectomy rate for small tumours with whole size <15mm and where no immediate reconstruction was recorded. 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 to ascertain the reasons for this non-random variation in clinical practice.

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 but South East Coast met the minimum standard that 90% of women should have their first therapeutic treatment within 2 months of their first assessment visit. 69% of women had their first therapeutic surgery within 2 months of their screening visit. This varied between 52% in East of England and London and 88% in South Central.

LYMPH NODES AND INVASIVE GRADE

In the UK as a whole, 97% of surgically treated invasive cancers had known nodal status. This varied between 92% in London to 99% in East Midlands, West Midlands, Wales, Scotland, and North East Yorkshire & Humber. In 7 screening units nodal status was ascertained for 100% of surgically treated invasive cancers. Regional QA reference centres with screening units with more than 10% of cases with unknown nodal status should audit the cases to determine the reasons for the absence of these important data. In the UK as a whole, 27% of surgeons performed the full sentinel lymph node procedure using isotope and blue dye. This varied from 0% in South East Coast and Northern Ireland to 56% in East of England. A further 54 surgeons (15%) carried out blue dye guided 4 node sampling. This was the predominant axillary technique used by surgeons in Wales (38%) and was used with the same frequency (27%) as the full sentinel lymph node procedure in Scotland.

In 2005/06 when a sentinel lymph node procedure was recorded for 2,859 invasive cancers, the proportion of cases with less than 4 nodes examined was 13.4%. However, 8.7% of these cases involved a sentinel lymph node procedure, leaving an underlying rate of 4.7%. In the UK as a whole, the proportion of cases with positive nodal status was again lower than in 2003/04. This may be related to the age expansion as the proportion of cases with positive nodal status is lower in women aged 65 years and older. 39% of the 518 cancers which had their positive nodal status determined from a sentinel lymph node procedure appear to have had a subsequent axillary procedure. For 52 cases, the positive nodal status was determined on the basis of fewer than 4 nodes as no subsequent axillary procedures were recorded. A further 53 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, 26% of non-invasive cancers had known nodal status. This varied from 18% in South West to 34% in North West and East Midlands. 1% of non-invasive cancers with known nodal status had positive nodal status recorded. This is consistent with previous studies suggesting that 2% of non-invasive breast cancers have non-identified invasive disease removed during the diagnostic process. Non-invasive cancers treated with mastectomy were more likely to have lymph nodes removed during surgery than those treated with conservation surgery. However, 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 will increase. 75% of conservatively treated non-invasive cancers with known nodal status had non-invasive disease predicted by a B5a (Non-invasive) core biopsy. Radiological or clinical factors may have thus influenced the decision to take nodes for these cases. For 13 cases (9%) a B5b (Invasive) core biopsy predicted invasive disease but the invasive status of the cancer was determined to be non-invasive after surgery. Nodes were therefore taken at surgery as recommended for the anticipated invasive disease.

Overall, 29% of invasive cancers were Grade I, 50% were Grade II and 20% were Grade III. Grade was not assessable for 87 cases (1%) and unknown for 91 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. As expected with cancers

detected by screening, the majority (60%) of cancers fell into the two best prognostic groups; the EPG (Excellent Prognostic Group) and GPG (Good Prognostic Group). The proportion of EPG and GPG cancers varied from 54% in Scotland to 62% in East Midlands, South West and Northern Ireland. The relatively low proportion of EPG and GPG cancers in Scotland is due to the high proportion of Grade III cancers compared with the UK as a whole. 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 511 consultant breast surgeons working in the UK NHSBSP in 2005/06, a rise of 22% from the 419 surgeons in 2000/01. 93% of women were treated by a surgeon with a screening caseload of at least 20 cases. Of the 149 surgeons with screening caseload of less than 10 cases, 46% treated more than 30 symptomatic breast cancers during 2005/06. Information was unavailable to explain the low caseload of 11 surgeons treating a total of 23 women. 9 of these surgeons were in London.

NUMBER AND SEQUENCE OF OPERATIONS

In the UK as a whole, 15% of cancers with a proven non-operative diagnosis by C5 cytology and/or B5 core biopsy underwent more than one therapeutic operation. 15% of invasive cancers and 16% of non-invasive cancers had more than one therapeutic operation. The proportion of invasive cancers having a repeat operation varied from 10% in North West to 18% in South West. The proportion of non-invasive cancers having a repeat operation varied from 10% in Northern Ireland and North West to 21% in East Midlands.

Invasive cancers with B5b (Invasive) core biopsy or on the basis of C5 cytology alone had fewest repeat operations (13% and 14% respectively). Invasive cancers with a B5a (Non-invasive) core biopsy had a 49% repeat operation rate. Non-invasive or micro-invasive cancers with a B5a (Non-invasive) core biopsy had a repeat operation rate of 19%. 84% of invasive cancers with a B5b (invasive) core biopsy underwent a single therapeutic operation consisting of conservation surgery or a mastectomy with an axillary procedure. For 5% of cancers, conservation surgery with an axillary procedure was followed by one repeat conservative operation, presumably to clear involved or close margins for either the original invasive cancer or associated DCIS. 4% of B5b (Invasive) cancers underwent repeat operations involving additional axillary procedures which were presumably undertaken to clear the axilla when initial axillary sampling or a sentinel lymph node biopsy indicated the presence of positive nodes. In South West, additional axillary procedures were performed on 70% of these cancers. 4% of B5b (Invasive) cancers had repeat operations which converted initial conservative operations to a mastectomy presumably either because extensive DCIS was present at the margins or because multi-focal invasive disease was present. In Northern Ireland, 10% of B5b (Invasive) cancers initially treated with conservation surgery eventually had a mastectomy.

69% of invasive cancers diagnosed by C5 cytology only underwent a single therapeutic operation consisting of conservation surgery with an axillary procedure. A further 14% of these cancers underwent a single therapeutic operation consisting of a mastectomy and an axillary procedure. 35% of these were in North East Yorkshire & Humber and 20% in North West. Presumably in these cases, the clinical and radiological signs were strongly supportive of the presence of invasive disease. Nevertheless, regional QA reference centres and regional QA surgeons should audit these cancers to ascertain the reasons for going straight to a mastectomy after C5 cytology.

80% of B5a (Non-invasive) cancers which were proven to be non-invasive or micro-invasive after surgery had a single operation to the breast. 4% of had a conservation surgery with axillary surgery and 534 (21%) had a mastectomy with an axillary procedure. The proportion of B5a (Non-invasive) cancers having an initial operation involving the axilla varied from 16% in South West to 38% in North West. 11% of non-

invasive and micro-invasive cancers with a B5a (Non-invasive) diagnosis initially treated with conservation surgery had a second or third conservative operation, presumably to clear DCIS which was still present at the tumour margins. This varied between 6% in Northern Ireland and 15% in South East coast and East Midlands. 7% of non-invasive and micro-invasive cancers with a B5a (Non-invasive) diagnosis had repeat operations which converted initial conservative operations to a mastectomy presumably either because extensive DCIS was present at the margins or because multi-focal invasive disease was present. In Northern Ireland, only 3% of these cases eventually had a mastectomy.

14% of invasive cancers with a B5a (Non-invasive) core biopsy underwent a single operation consisting of conservation surgery with an axillary procedure and 28% had a mastectomy with an axillary procedure. The proportion of invasive B5a (Non-invasive) cancers which had surgery to the axilla at the first operation varied from 34% in West Midlands to 66% in South West. Presumably in these cases, contrary to the core biopsy result, the clinical and radiological signs were strongly supportive of the presence of an invasive cancer. 15% of invasive B5a (Non-invasive) cancers initially treated with conservation surgery alone or initially treated with conservation surgery and axillary surgery were converted to mastectomies after one or more further operations. 17% of invasive B5a (Non-invasive) cancers had repeat conservative operations presumably carried out because of the presence of extensive or multi-focal DCIS. In South West, 31% of these cancers had repeat conservation surgery.

While the overall repeat operation for tumours with invasive size less than 20mm and whole size 30mm or more is 34%, the repeat operation rate for tumours with whole size and invasive size less than 20mm is only 11%. This illustrates the extent to which associated DCIS can contribute to repeat operation rates for invasive cancers. The overall repeat operation rate for all invasive cancers is 15%. When invasive cancers with a B5a (Non-invasive) non-operative diagnosis are excluded, this falls to 12%.

In the UK as a whole, axillary surgery was performed for 98% of invasive cancers with a B5b (Invasive) core biopsy. For 97% 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 operation, with 1% having their axillary surgery at a repeat operation. 90% of invasive cancers with a B5a (Non-invasive) diagnosis had axillary surgery. 51% of these cancers had their axillary surgery at the first operation, with repeat operations providing nodal data for the additional 40%. 183 invasive cancers with a B5b (Invasive) core biopsy, 26 invasive cancers with C5 cytology and 68 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

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 22% in women aged 50-52 to 8% in women aged 68-70. 44% of women received the most common treatment for screen detected breast cancer in the UK which was surgery, radiotherapy, and hormone therapy. ER status was unknown for 388 (4%) of invasive cancers and 49% of non-invasive cancers. 86% of invasive cancers were ER positive. PgR status data were available for 83% of ER negative invasive cancers. HER-2 status data were available for only 26% of the invasive cancers. Of the 2,456 invasive cancers with known HER-2 status, 23% were positive. Regional QA reference centres and regional QA surgeons should ascertain the reasons why HER-2 status was not available.

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 33% of cases received radiotherapy within 60 days of their final surgery. Women in North East, Yorkshire & Humber and South East Coast experienced the longest waits for radiotherapy.

91% of women with invasive cancer treated with conservation surgery received adjuvant radiotherapy, compared to only 50% of women with conservatively treated non-invasive cancer. 66% of the 563 conservatively treated invasive cancers without adjuvant radiotherapy recorded were small (<15mm) tumours. 66% of the 816 conservatively treated non-invasive cancers without radiotherapy were other (low or medium) cytonuclear grade and 61% were small (<15mm) in diameter. Regional QA reference centres and QA surgeons should audit the cancers in their regions to determine the reasons why some invasive cancers treated with conservation surgery do not appear to have received radiotherapy. 13% of women with ER negative, node positive invasive cancers did not have chemotherapy recorded compared to 57% of ER negative, node negative invasive cancers. This suggests that nodal status was taken into account when deciding whether women would benefit from chemotherapy. 83% of the 261 ER negative, node negative invasive cancers given chemotherapy were Grade III and 23% were HER-2 positive. Regional QA reference centres and QA surgeons should audit the cancers in their regions to determine the reasons why some women with ER negative, node positive invasive cancers did not have chemotherapy recorded.

The decision to give hormone therapy did appear to depend to a large extent on ER and PgR status. However, 7% of ER positive, invasive cancers and 37% of ER negative, PgR positive invasive cancers did not have hormone therapy recorded and 8% of ER negative cancers did receive hormone therapy. 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 status. 46% of ER negative, invasive cancers with negative PgR status did not have chemotherapy recorded. Regional QA reference centres and regional QA surgeons should determine the reasons why chemotherapy does not appear to have been given to these cancers. 290 (51%) HER-2 positive cases did not have chemotherapy recorded. 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

Of the 9,105 cancers with known invasive status submitted to the survival analysis for the period 1 April 2000 to 31 March 2001, 206 (2%) were excluded because they were not registered at cancer registries. A further 71 cancers (1%) were excluded because they were not confirmed to be primary tumours and 14 because their invasive status was not known. The survival analysis included 8,814 screen detected cancers. Data completeness has improved markedly in the 8-year history of the audit with only 11% of cancers diagnosed in 2000/01 having an unknown NPI compared with 54% diagnosed in 1992/93. The 5 year relative survival for invasive cancers in 2000/01 was 96.4% (95% CI 95.7%-97.0%). Women with non-invasive breast cancer had a 5 year relative survival higher than 100%, indicating that their chance of survival was no worse than that of the general UK female population.

5 year relative survival was significantly lower for the 1% of invasive cancers with diameter greater than 50mm, for the 17% of invasive cancers which were Grade III and for the 23% of cancers which were node positive. 5 year relative survival in women with <10mm diameter cancers was no worse than that of the general UK population. 5 year relative survival in women with node negative cancer was 99.0% (95% CI 98.3%-99.6%). Women with cancers in the NPI moderate prognosis group 2 and poor prognostic group (MPG2 and PPG) have significantly lower survival rates at 3 and 5 years than those with cancers in the excellent, good and moderate prognostic group 1 (EPG, GPG and MPG1).

CHAPTER 1
BREAST CANCERS DETECTED BY THE UK NHSBSP

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

The 2005/06 NHSBSP and ABS at BASO breast audit examined surgical screening activity undertaken for the 1,942,449 women screened in England, Wales, Northern Ireland and Scotland between 1 April 2005 and 31 March 2006. 15,944 cancers were detected by the UK NHSBSP in women of all ages. This equates to a cancer detection rate of 8.2 cancers per 1,000 women screened. This varies from 7.0 per 1,000 screened in Northern Ireland to 8.7 per 1,000 screened in South East Coast. Figure 1 shows the invasive status of these 15,944 cancers. Overall, 12,600 (79%) were invasive, 3,159 (20%) non-invasive and 158 (1%) micro-invasive. The invasive status of 27 cancers was unknown.

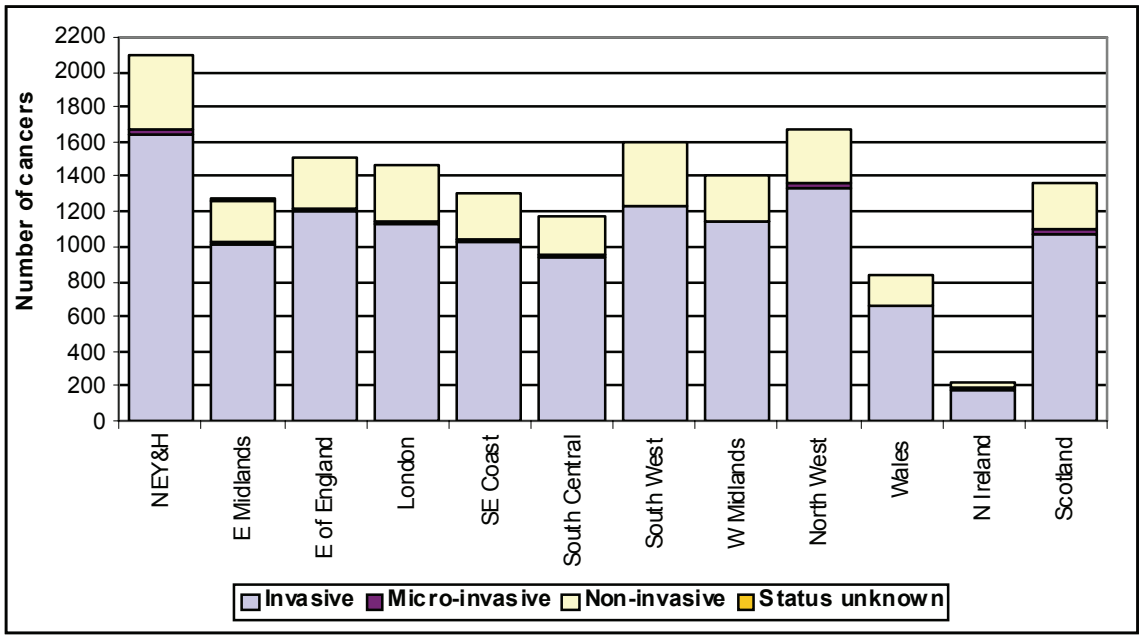

Figure 1 (Table 1): Variation in the number and invasive status of screen detected breast cancers in each region and country contributing to the 2005/06 NHSBSP and ABS at BASO breast audit

The UK invasive cancer detection rate was 6.5 per 1,000 women screened, varying between 5.6 per 1,000 screened in Northern Ireland and 6.9 per 1,000 screened in South Central and South East Coast. The UK non-invasive cancer detection rate of 1.7 per 1,000 screened includes both non-invasive and micro-invasive cancers. This rate varied from 1.4 per 1,000 screened in Northern Ireland to 1.9 per 1,000 in Wales and South West.

The following summary table shows that invasive and non-invasive cancer detection rates have risen steadily since 1996/97. The number of women screened has risen by more than 360,000 since the NHSBSP started to expand the screening programme to invite women up to 70 years of age in 2002/03. This has had a marked effect on the number of cancers detected, with 1,904 more cancers diagnosed in 2005/06 compared with 2004/05.

10 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

*Data from Scotland are absent in 1998/99

95 screening units in the UK are included in the audit. The number of women screened varies from 814 women in a screening unit in East of England (where only 5 cancers were detected) to 59,145 women in a screening unit in Scotland.

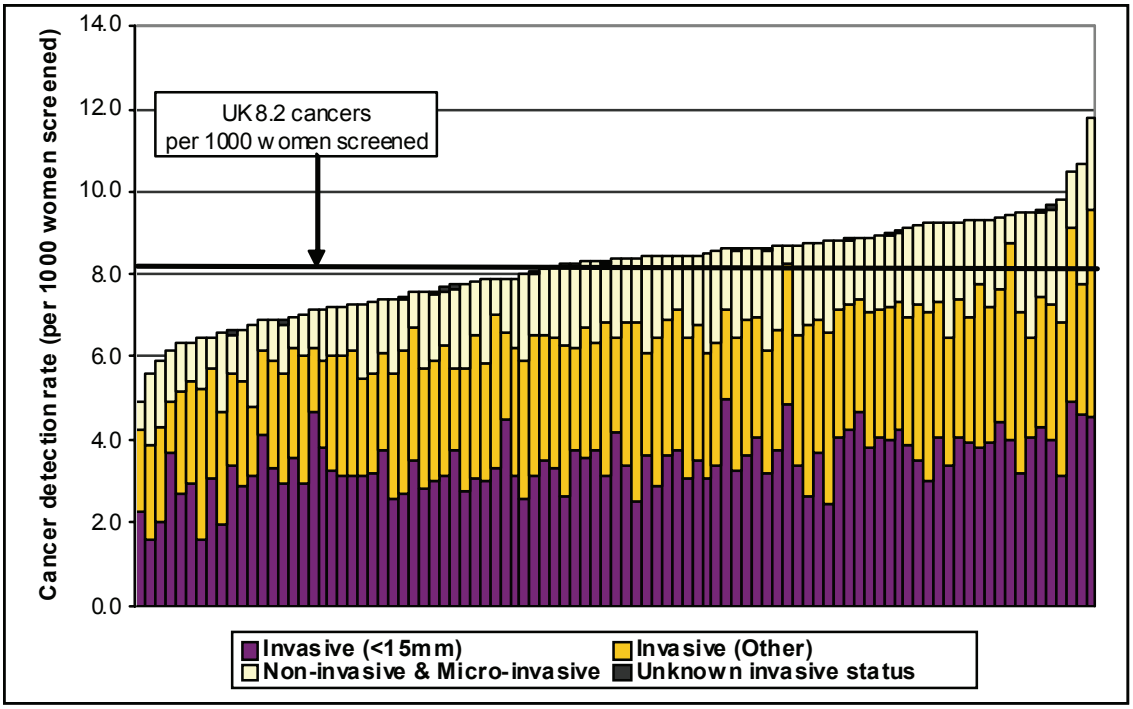

Figure 2: Variation with screening unit in the overall cancer detection rate expressed as the number of cancers detected per 1,000 women screened

Figure 2 shows the cancer detection rates in each screening unit according to invasive status. The overall cancer detection rate varied from 4.6 per 1,000 women screened in a unit screening 7,599 women to 11.8 per 1,000 women screened in a unit screening 13,737 women annually.

1.2 Age Profile of Women with Screen Detected Breast Cancer

The majority (66%) of women with a screen detected breast cancer were aged between 50 and 64 when they were invited for the screening appointment leading to their diagnosis. In the UK as a whole, 14% of screen detected breast cancers were detected in women aged 56-58 and 15% in women aged 59-61. 27% of screen detected breast cancers were detected in women aged 65-70 compared with 21% in this age group in 2004/05 and 18% in 2003/04.

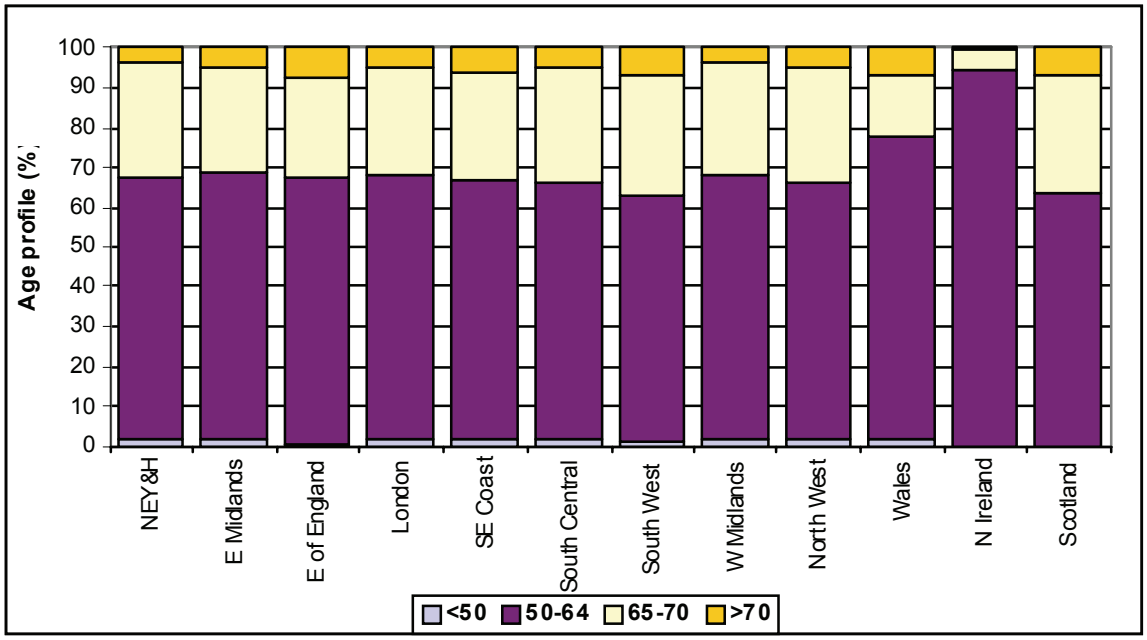

Figure 3 (Table 2): Age at screening appointment

The expansion of the NHSBSP to include women aged 50-70 has now been rolled out across the country, except Northern Ireland. At the start of this audit period, 75 of the 81 breast screening units in England had extended their programmes. All screening units in England, Wales and Scotland had started age expansion by April 2006, although not all of them had completed the process. These changes are reflected in the proportion of breast cancers detected in women aged 65-70, which ranged from 5% in Northern Ireland where the expansion was not implemented during the audit period, to 30% in South West and Scotland.

AGE OF SCREEN DETECTED BREAST CANCERS (%)

Age	*2002/03*	*2003/04*	*2004/05*	*2005/06*
<50	*2*	*2*	*2*	*1*
50-52	*17*	*15*	*14*	*13*
53-55	*16*	*13*	*12*	*11*
56-58	*16*	*17*	*16*	*14*
59-61	*16*	*16*	*16*	*15*
62-64	*16*	*14*	*14*	*14*
65-67	*7*	*10*	*11*	*14*
68-70	*6*	*8*	*10*	*13*
70+	*4*	*5*	*5*	*6*
Total	***100***	***100***	***100***	***100***

COMMENT:

- 1,942,449 women were screened by the UK NHSBSP in England, Wales, Northern Ireland and Scotland between 1 April 2005 and 31 March 2006.
- 15,944 cancers were detected in women of all ages. This equates to a cancer detection rate of 8.2 cancers per 1,000 women screened.
- 66% of women with a screen detected breast cancer were aged between 50 and 64 when they were invited for the screening appointment leading to their diagnosis compared with 72% in 2004/05. 27% of screen detected breast cancers were detected in women aged 65-70 compared with 21% in this age group in 2004/05 and 18% in 2003/04.

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 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 6 such cancers in 2005/06.

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 2005/06, 94% of cancers detected in the UK NHSBSP were diagnosed non-operatively. All regions met the target of 90% non-operative diagnosis rate with only 3% 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 (34%) 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 (28% and 22% 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 the women before they leave the assessment clinic.

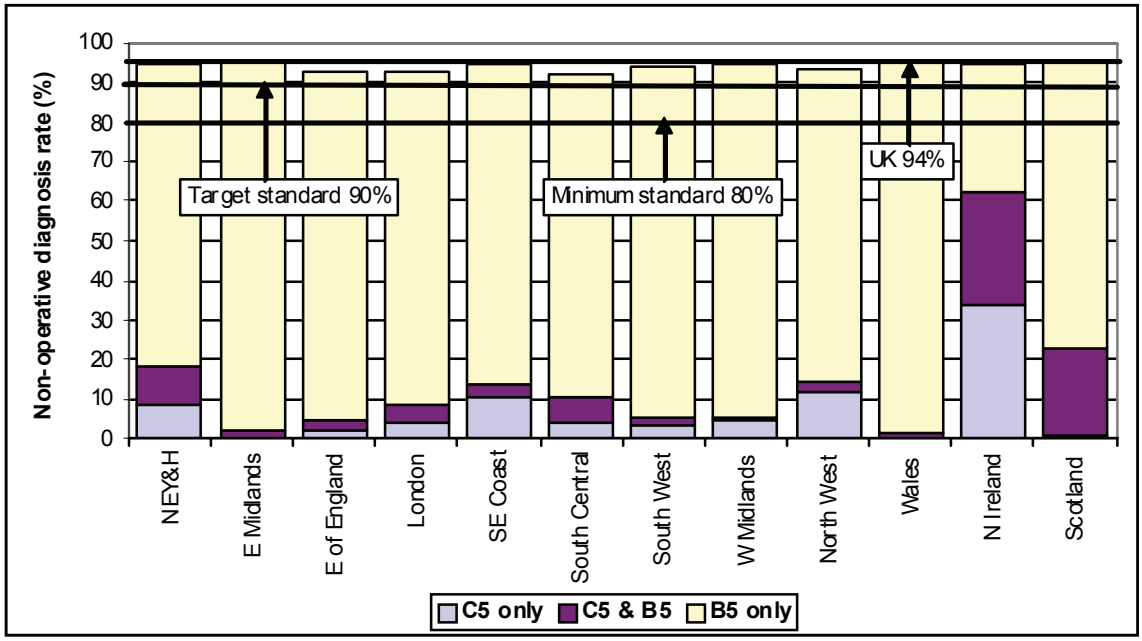

Figure 4 (Table 4): Variation in non-operative diagnosis rate and the proportion of cancers detected by cytology alone, core biopsy alone or cytology and core biopsy as a percentage of cancers detected

As demonstrated in the table below, over the last 10 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 83% in the proportion of cancers diagnosed by B5 core biopsy alone.

10 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*

*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 3 audit periods. The non-operative diagnosis rate has increased slightly in most regions.

3 YEAR SUMMARY: NON-OPERATIVE DIAGNOSIS RATES								
	Non-operative diagnosis rate (%)				Cancer diagnosed by C5 only (%)			
Region	2003/04	2004/05	2005/06	3 Year 2003-06	2003/04	2004/05	2005/06	3 Year 2003-06
N East, Yorks & Humber	93	94	94	94	13	11	9	11
East Midlands	94	95	95	95	4	1	0	2
East of England	93	93	93	93	6	1	2	3
London	93	93	93	93	5	4	4	4
South East Coast	93	93	95	93	13	8	11	11
South Central	94	93	92	93	6	6	4	5
South West	92	91	94	92	6	5	3	5
West Midlands	92	95	95	94	6	6	5	6
North West	92	93	93	93	14	12	12	13
Wales	94	94	95	94	1	0	0	0
Northern Ireland	94	95	95	94	31	45	34	36
Scotland	92	92	95	93	5	3	1	3
United Kingdom	**93**	**93**	**94**	**93**	**8**	**7**	**5**	**7**

Figure 5 shows the non-operative diagnosis rates achieved by individual screening units. All screening units have met the 80% minimum standard for overall non-operative diagnosis. 88 of the units also met or exceeded the overall non-operative diagnosis target of 90%. Non-operative diagnosis rates varied from 82.9% in a screening unit with a total of 187 cancers to 100% in 2 screening units with 5 and 41 cancers.

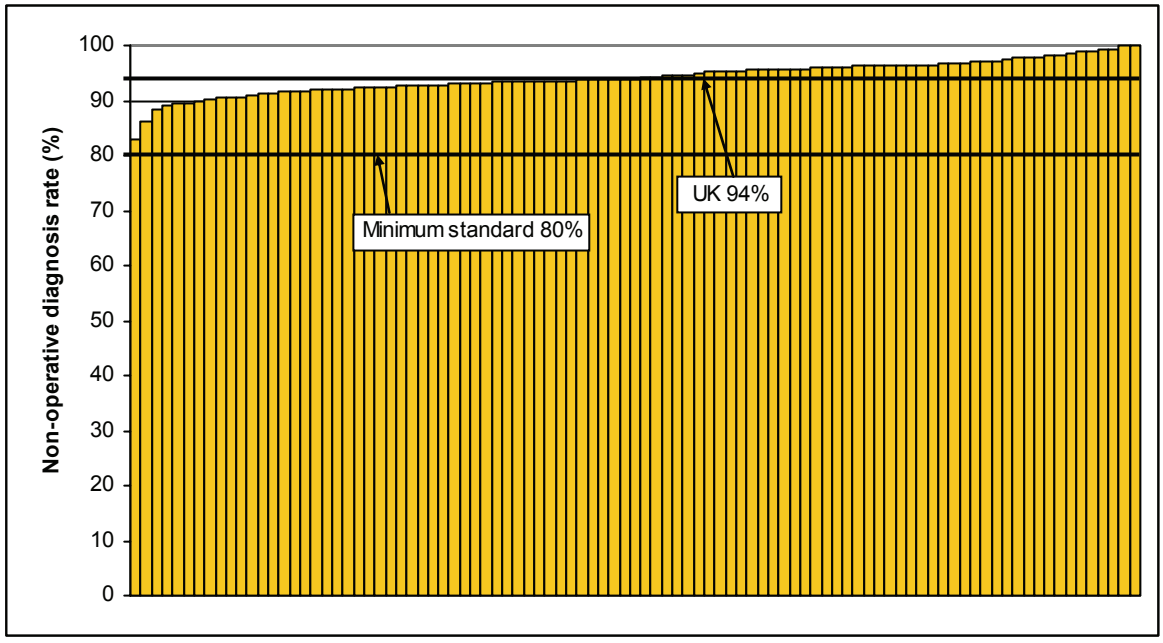

Figure 5: Variation in non-operative diagnosis rate with screening unit, expressed as a proportion of cancers detected in each screening unit

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

Overall, the non-operative diagnosis rates for invasive and non-invasive cancers were 97% and 81% respectively. Figure 6 shows the regional variation in the proportion of invasive and non-invasive cancers without a non-operative diagnosis. The 90% target for non-operative diagnosis which applies to all cancers was achieved by all regions for invasive cancers with only 3% (327 cancers) not having a non-operative diagnosis. The proportion of non-invasive cancers without a non-operative diagnosis varied from 12% in Wales to 25% in South Central. The UK non-invasive non-operative diagnosis rate increased from 80% in 2004/05 to 81% in 2005/06.

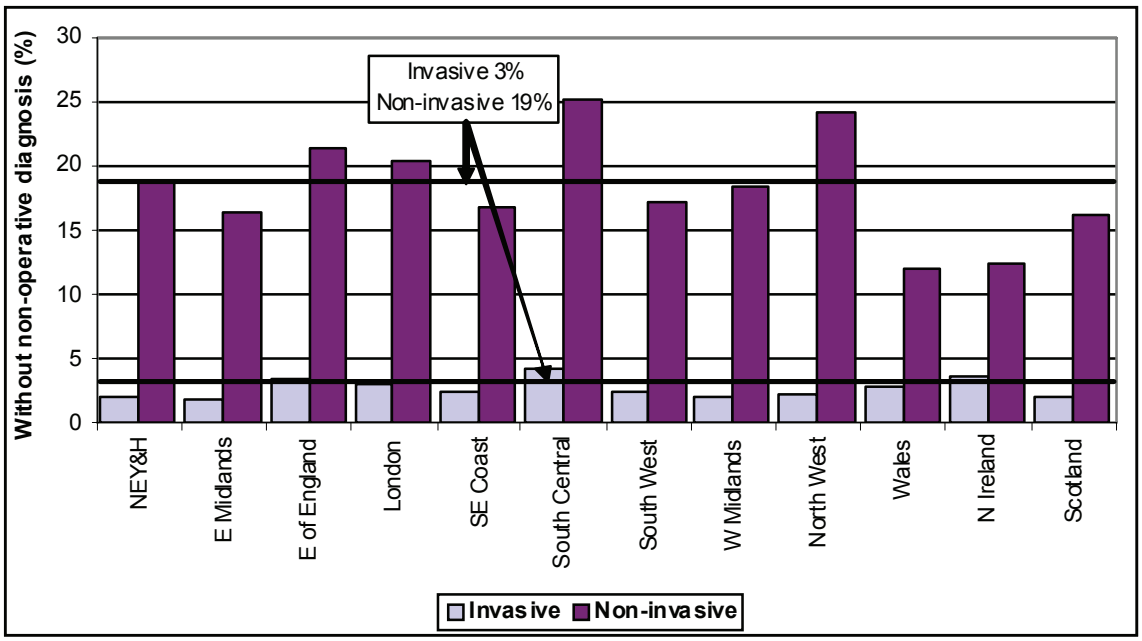

Figure 6 (Tables 5, 6): Variation in the proportion of invasive cancers and non-invasive cancers without a non-operative diagnosis

COMMENT:

- In 2005/06, 94% of cancers detected in the UK NHSBSP were diagnosed non-operatively. All regions met the 90% target. The non-operative diagnosis rates for invasive and non-invasive cancers were 97% and 81% respectively.
- 88 screening units met or exceeded the overall non-operative diagnosis rate target of 90%. This is the second year that all screening units met the 80% minimum standard.
- In the UK as a whole, the overall non-operative diagnosis rate has been either 93% or 94% for the last 3 years. The proportion of cancers diagnosed by C5 cytology alone fell from 7% in 2004/05 to 5% in 2005/06.
- For non-invasive cancers, in no region did 90% of cancers have a non-operative diagnosis and in 4 regions less than 80% of non-invasive cancers were diagnosed non-operatively.
- The proportion of non-invasive cancers without a non-operative diagnosis varied from 25% in South Central to 12% in Wales.

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 14,128 cancers with a B5 diagnosis, 3,267 (23%) were B5a (Non-invasive), 10,685 (76%) were B5b (Invasive) and 176 cancers (1%) had invasive status B5c (Not Assessable or Unknown) at core biopsy. Of the latter cancers, 60 were in East of England, 50 in North East, Yorkshire & Humber and 30 in South West. The regional QA reference centres should review these cases and ascertain the reason for the relatively high numbers of B5c cases.

Figure 7 shows the regional variation in the invasive status at core biopsy. Northern Ireland had the highest proportion of cancers with B5a (Non-invasive) diagnosis at core biopsy (32%). This may be related to the relatively high proportion of cancers diagnosed by C5 cytology alone in Northern Ireland (34%, Table 4) and is consistent with the preferential use of core biopsy to diagnose cancers suspected to be non-invasive on the basis of imaging.

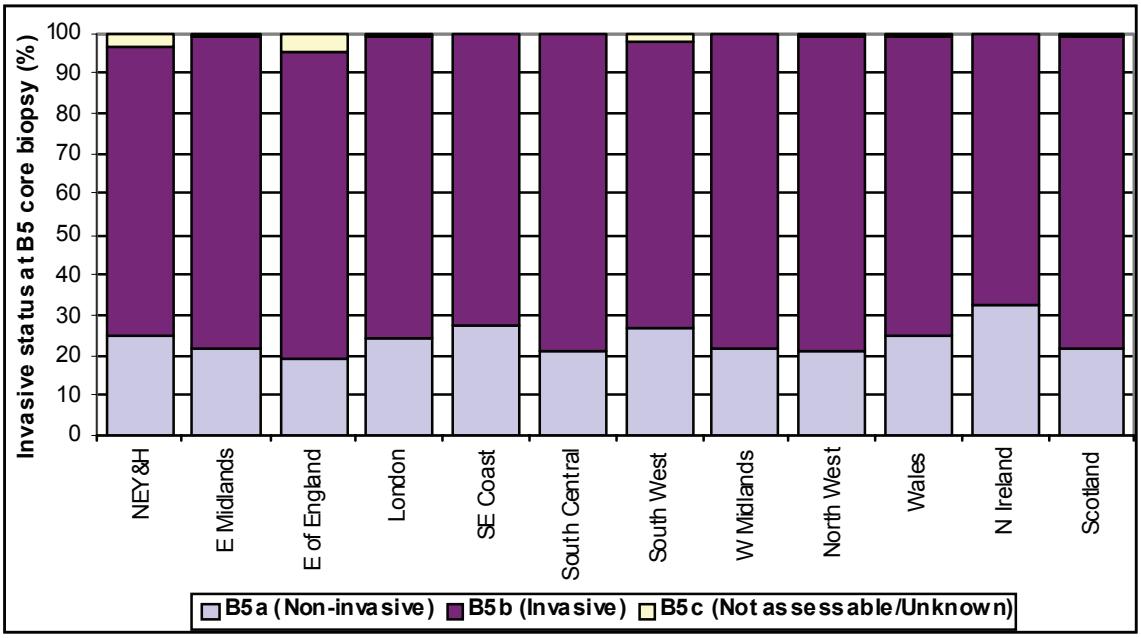

Figure 7 (Table 7): Variation in the proportion of cancers with B5a (Non-invasive), B5b (Invasive) and B5c (Not Assessable or Unknown) core biopsy diagnosis, expressed as a percentage of cancers diagnosed by core biopsy

2.1.4 Invasive Status at Core Biopsy Compared with Invasive Status After Surgery

The majority of cancers diagnosed by core biopsy go on to have surgery, at which a definitive invasive status is determined. 37 of the 3,267 cancers with a B5a (Non-invasive) non-operative diagnosis had no surgery and 8 had unknown surgery, so the non-operative diagnosis of non-invasive cancer was retained. Of the remaining 3,222 cases, 2,384 (74%) had surgical confirmation of non-invasive cancer and 126 (4%) had a diagnosis of micro-invasive cancer following surgery.

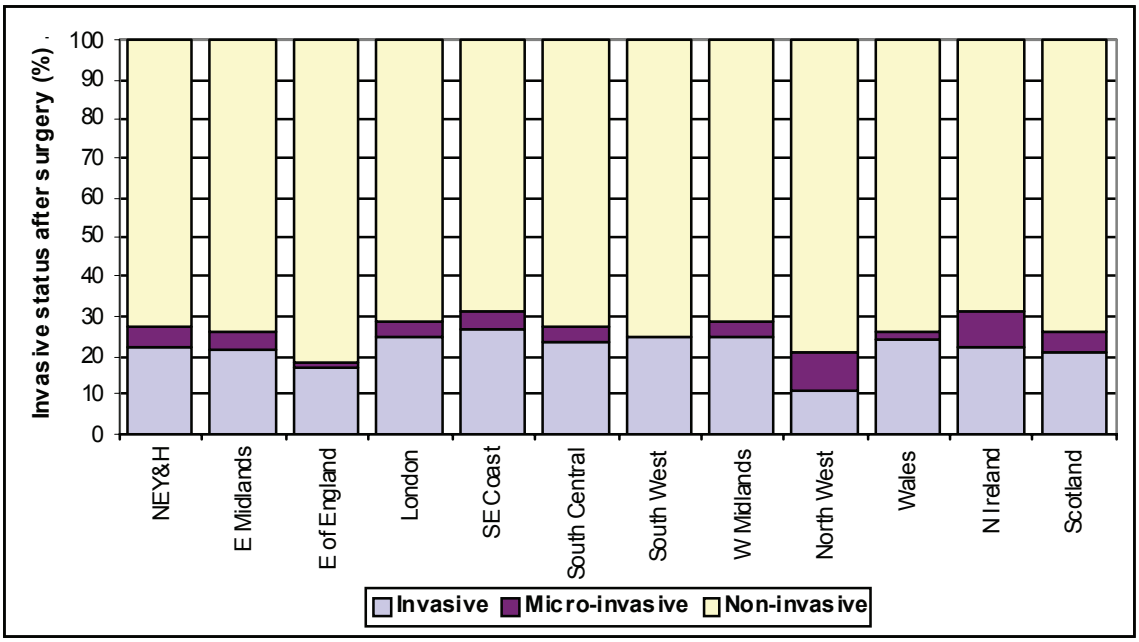

Figure 8 (Table 8): Variation in the invasive status after surgery of cases with a B5a (Non-invasive) non-operative diagnosis, expressed as a percentage of cancers diagnosed as B5a (Non-invasive)

Figure 8 shows that North West has a relatively high proportion of micro-invasive cancers, with 28 cases (10%) found to be micro-invasive following a B5a core biopsy. The regional QA reference centre should audit these cases to ascertain if they are localised to one unit. For 712 (22%) cancers, invasive disease was found at surgery. This varied from 11% in North West to 27% in South East Coast.

Figure 9 shows the variation with screening unit in the invasive status after surgery of cases with B5a (Non-invasive) core biopsy. The wide variation is affected by small numbers. 1 screening unit had no cases with B5a non-operative diagnosis. For units which had 15 or more cancers diagnosed as B5a (Non-invasive) by core biopsy, the proportion of B5a (Non-invasive) cancers found to be invasive after surgery varied from 0% in 4 units, which had 16 to 53 B5a (Non-invasive) cases, to 56% in one unit which had 16 B5a (non-invasive) cases. The regional QA reference centres should carry out audits with the 9 screening units where the proportion of B5a (Non-invasive) cancers found to be invasive at surgery exceeds 40%.

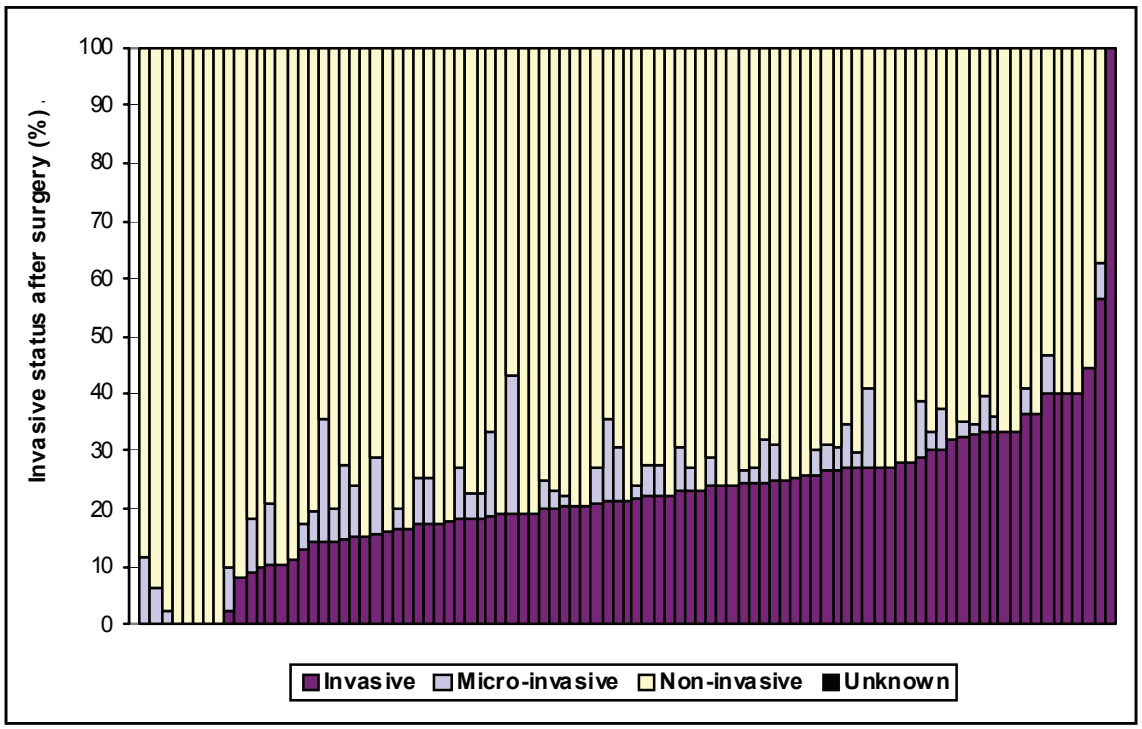

Figure 9: Variation with screening unit in the invasive status after surgery of cases with a B5a (Non-invasive) non-operative diagnosis, expressed as a percentage of cancers diagnosed as B5a (Non-invasive)
***One screening unit had no cancers with B5a non-operative diagnosis in this audit period**

Of the 10,685 cancers with a B5b (Invasive) non-operative diagnosis, 200 cases had no surgery and 16 cases had unknown surgical treatment, so the invasive status of the core biopsy was retained. In the UK as a whole, 99% (10,409 cases) of the remaining 10,469 cases had surgical confirmation of invasive cancer, the invasive status predicted by core biopsy. These data are shown for each region in Table 9. 60 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.

6 YEAR COMPARISON: INVASIVE STATUS FOLLOWING CORE BIOPSY

Year of data collection	*B5a (Non-invasive)*			*B5b (Invasive)*		
	Total	*Not non-invasive after surgery*		*Total*	*Not invasive after 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*

The summary table above shows that the proportion of cancers that had a B5a (Non-invasive) non-operative diagnosis but which were found to be micro-invasive or invasive after surgery has fallen by

3% in the past 6 years (from 29% to 26%). The proportion of cases with a B5b (Invasive) core biopsy which were not confirmed to be invasive following surgery has varied slightly between 1.4% and 0.5% during the last 6 years. In 2005/06 23 (38%) of these cancers were diagnosed in 4 screening units.

2.1.5 Invasive Status of Cancers Diagnosed by C5 Cytology Only

872 cancers were diagnosed by cytology only, not including cases diagnosed by both C5 cytology and B5 core biopsy. Overall, 8 of these cancers had no surgery. 96% of the 833 cancers diagnosed by C5 cytology alone with known surgical treatment were invasive, varying from 54% in Scotland (7 cases) to 100% in Wales (1 case) and East Midlands (3 cases) (Table 10). In the UK as a whole, 29 cancers (3%) diagnosed by C5 cytology alone were non-invasive and no cancers were micro-invasive. The invasive status of 2 cancers was unknown.

COMMENT:

- For 22% of cancers with a B5a (Non-invasive) non-operative diagnosis, invasive disease was found at surgery. This varied from 11% in North West to 27% in South East Coast.
- For units which had 15 or more cancers diagnosed as B5a (Non-invasive) by core biopsy, the proportion of B5a (Non-invasive) cancers found to be invasive after surgery varied from 0% in 4 units, which had 16 to 53 B5a (Non-invasive) cases, to 56% in one unit which had 16 B5a cases.
- North West has a relatively high proportion of cancers found to be micro-invasive following a B5a (non-invasive) core biopsy. The regional QA reference centre should audit these cases to ascertain if they are localised to one unit.
- 60 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.
- 96% of 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.

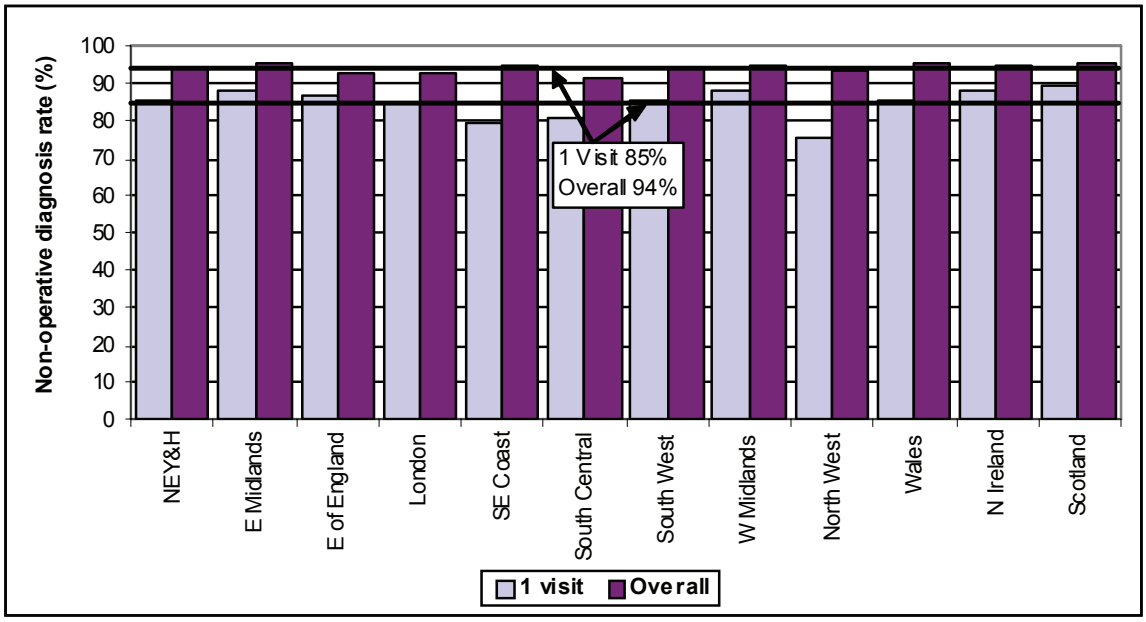

Figure 10 (Table 13): The proportion of cancers diagnosed by C5 cytology and/or B5 core biopsy at 1 visit, as a proportion of all screen detected cancers, compared to the overall non-operative diagnosis rate

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. 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, 85% of the 15,944 cancers included in the audit achieved a non-operative diagnosis of cancer after one assessment clinic visit. This varies from 75% in North West to 90% in Scotland.

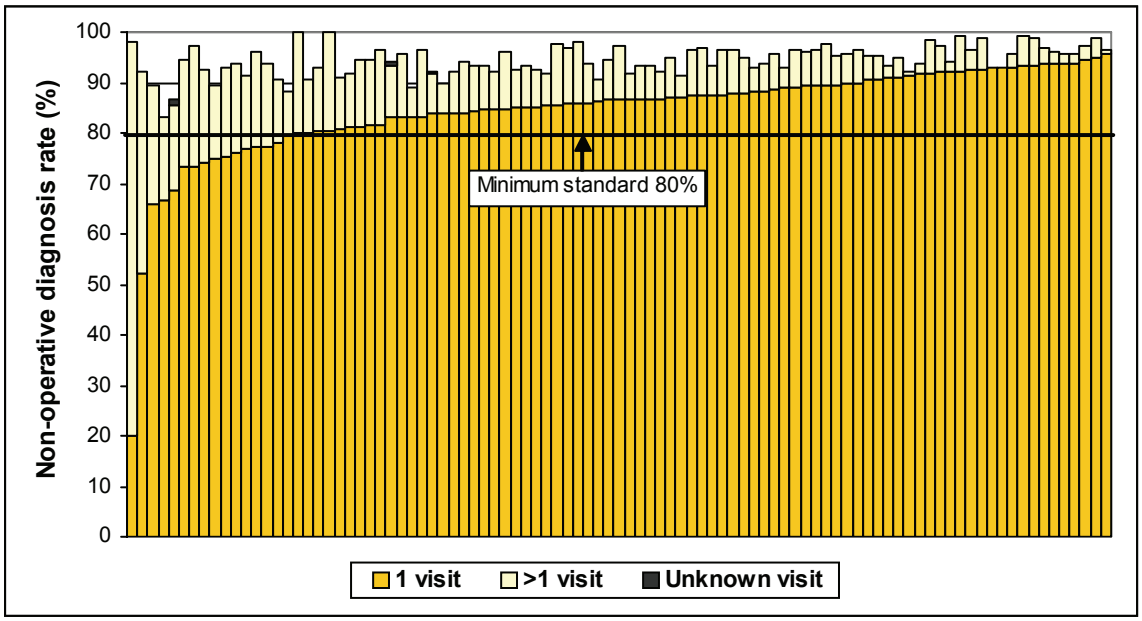

Figure 11: Variation in the proportion of cancers diagnosed by C5 cytology and/or B5 core biopsy at 1 visit and more than 1 visit, as a proportion of all screen detected cancers in each screening unit

Figure 11 illustrates the ability of individual screening units to achieve a definitive non-operative diagnosis at one assessment visit. 16 screening units did not achieve the 80% non-operative diagnosis minimum standard at one visit, but all the units reached the minimum non-operative diagnosis standard when all attempts were included. Two screening units had particularly low non-operative diagnosis rates at the first visit and a further 3 units achieved a non-operative diagnosis rate of less than 70% (the previous minimum standard at the first visit). QA reference centres should carry out audits with the 5 screening units where the proportion of non-operative diagnosis achieved at the first assessment visit was below 70%.

Some caution should be exercised when interpreting these data, as there may be inconsistencies between individual units as to what has been counted as an assessment visit. Some regional breast screening units do not, as a rule, undertake interventional procedures on the first assessment visit, preferring to call the woman back to another clinic with the pre-knowledge that she will be undergoing a procedure. It is uncertain in these instances if these units are counting the cases as requiring two assessment visits to achieve a diagnosis or only one visit for a core biopsy or a fine needle aspiration. Regional QA reference centres should liaise with their screening units in order to clarify their policies for recording visits to assessment clinics so that more definitive data are available for this important area in future audits.

COMMENT:

- 89% of women had all attempts at core biopsy and/or cytology performed at one assessment clinic visit.
- 16 screening units failed to achieve the 80% non-operative diagnosis minimum standard at one visit.
- Regional QA reference centres should liaise with their screening units in order to clarify their policies for recording visits to assessment clinics, so that more definitive data are available for this important area in future audits.

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 in 2005/06, 2,791 diagnostic open biopsies were performed. Of these, 1,847 (66%) were benign and 944 (34%) were malignant.

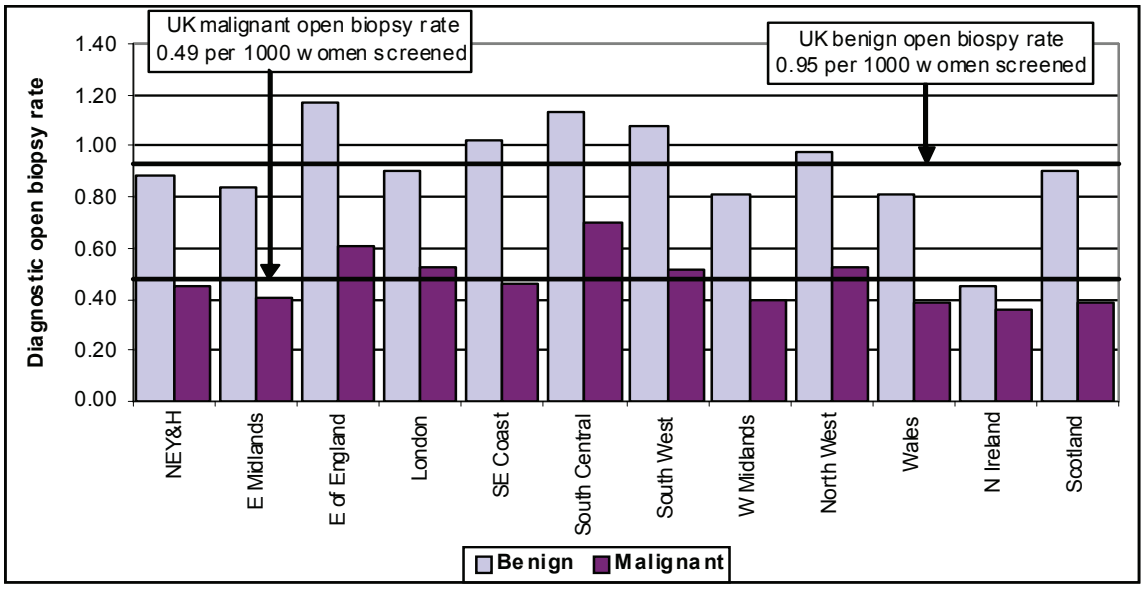

Figure 12 (Table 14): Variation in benign and malignant diagnostic open biopsy rates expressed as the number of diagnostic open biopsies undertaken per 1,000 women screened

The benign open biopsy rate was 0.95 per 1,000 women screened, varying from 0.45 per 1,000 in Northern Ireland to 1.18 per 1,000 in East of England. Overall, the malignant open biopsy rate was 0.49 per 1,000 women screened, varying from 0.36 per 1,000 in Northern Ireland to 0.70 per 1,000 in South Central.

10 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

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

The summary table shows that the benign open biopsy rate has fallen over 10 years from 1.50 per 1,000 women screened in 1996/97 to 0.95 per 1,000 women screened in 2005/06. Over the same period, the malignant open biopsy rate has fallen from 2.04 per 1,000 to 0.49 per 1,000 as the non-operative diagnosis rate has increased from 63% to 94%.

Table 15 shows false positive cytology and core biopsy figures obtained from CQA and BQA reports for each region. In the UK as a whole, there were 7 false positive cytology cases and 32 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. It is possible that many of these are cases where the whole of the malignant tumour was removed in the core biopsy or mammotome specimen.

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

The number of cancers diagnosed by open biopsy has increased from 927 cancers in 2004/05 to 944 cancers in 2005/06. Of the latter, 327 (35%) were invasive, 12 (1%) micro-invasive and 598 (63%) non-invasive (Table 16). Invasive status was unknown for 7 cases. 475 (48%) of the 944 cases did not have further surgical treatment after their diagnostic open biopsy. 26 of the 944 cases were treated by mastectomy or mastectomy with axillary surgery as the first treatment. 10 of these are from North West. 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 17 and 18 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 70% of invasive cancers diagnosed by open biopsy there had been unsuccessful attempts to obtain a non-operative diagnosis using core biopsy alone (Table 17). For non-invasive cancers the proportion of cases where non-operative diagnosis had been attempted with core biopsy alone was higher at 90% (Table 18).

Table 17 also shows that, of the 327 invasive cancers diagnosed by open biopsy, 19 (6%) had no non-operative procedure recorded. Of the 598 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 30 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.

6 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

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

The 6 year summary table above 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 11%, while the proportion undergoing core biopsy alone has risen from 36% to 70%.

Figure 13 shows the highest 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 (32 cases) had an inadequate (C1) cytology sample or a normal (B1) core biopsy sample. This varied from 0% in East Midlands to 14% in Northern Ireland (1 case) and Scotland (3 cases). 9% had a benign (C2/B2) result (31 cases), 34% were suspicious of benign disease (C3/B3, 111 cases) and 41% were suspicious of malignant disease (C4/B4, 134 cases).

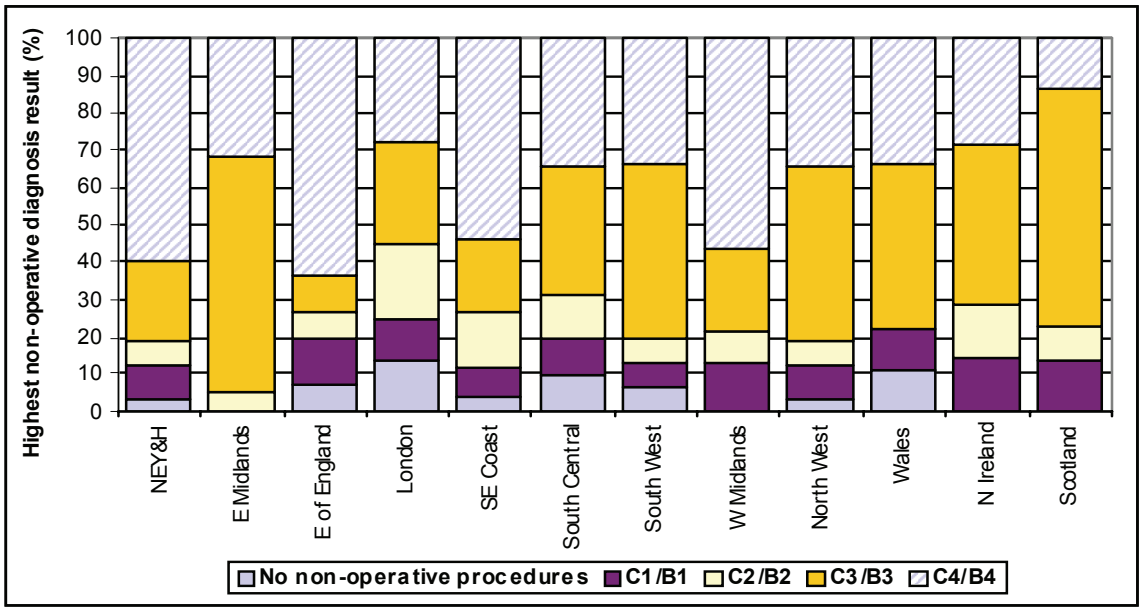

Figure 13 (Table 19): The highest non-operative diagnosis result for invasive cancers diagnosed by open biopsy, expressed as a percentage of invasive malignant diagnostic open biopsies

In East of England, South East Coast, West Midlands and North East Yorkshire & Humber, the majority of invasive cancers diagnosed by open biopsy had a B4 core biopsy or C4 cytology result indicating suspicion of malignancy prior to diagnostic surgery. In East of England 63% of cases requiring an open biopsy to achieve a definitive diagnosis had a C4 cytology and/or B4 core biopsy result. The QA reference centre in this region should audit practice to ascertain the reason for the relatively high proportion of cancers with C4 and/or B4 cytology or biopsy results, implementing corrective action as appropriate.

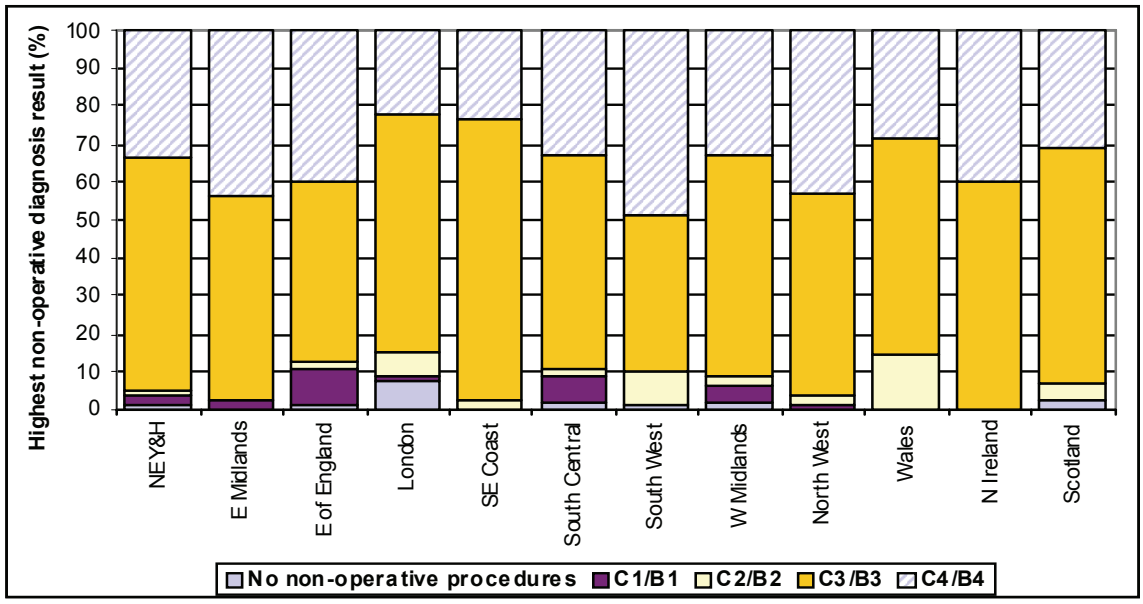

Figure 14 (Table 20): The highest non-operative diagnosis result for non-invasive cancers diagnosed by open biopsy, as a percentage of non-invasive malignant diagnostic open biopsies

Figure 14 shows the highest non-operative result for cancers without a non-operative diagnosis which were ultimately determined to be non-invasive. Overall, 35% of these non-invasive cancers had a C4 and/or B4 cytology or biopsy result (211 cases) and 57% had a C3 and/B3 non-operative result (338 cases). In South West, 48% (30 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 these unusual results, implementing corrective action as appropriate.

6 YEAR COMPARISON :
HIGHEST 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

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

The summary table above shows that throughout the 6 year period studied, the highest proportion (42% - 46%) of invasive cancers diagnosed by malignant open biopsy were those with C4 cytology or B4 core biopsy. The proportion of invasive cancers with C3 cytology or B3 core biopsy has increased over the 6 year period from 18% to 36%, while the proportion with C1 cytology or B1 core biopsy has fallen from 22% to 10%. The summary table below shows that the proportion of non-invasive cancers with C3 cytology or B3 core biopsy has increased over the 6 year period studied, from 27% in 2000/01 to 58% in 2005/06, while the proportion with C1 cytology or B1 core biopsy has fallen sharply from 20% to 3%.

6 YEAR COMPARISON :
HIGHEST 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

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

COMMENT:

- In the UK as a whole, 2,791 diagnostic open biopsies were performed in 2005/06. Of these 66% were benign and 34% were malignant.
- The benign open biopsy rate was 0.95 per 1,000 women screened in 2005/06. The malignant open biopsy rate has fallen from 2.04 per 1,000 women screened in 1996/97 to 0.49 per 1,000 women screened in 2005/06 as the non-operative diagnosis rate has increased from 63% to 94%.
- In the UK as a whole, there were 7 false positive cytology cases and 32 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.
- 26 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.

COMMENT:

- 19 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 30 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.
- 41% of invasive cancers and 35% of non-invasive cancers diagnosed by malignant open biopsy following cytology or core biopsy performed during the assessment process had C4 cytology or B4 core biopsy indicating suspicion of malignant disease. Regional QA reference centres in East of England and South West 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 Cancer

The variation in treatment type for non-invasive and micro-invasive breast cancers in each region is shown in Figure 15. 37 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, 68% of non-invasive and micro-invasive cancers were treated with conservation surgery, varying from 59% in East Midlands to 77% in South West.

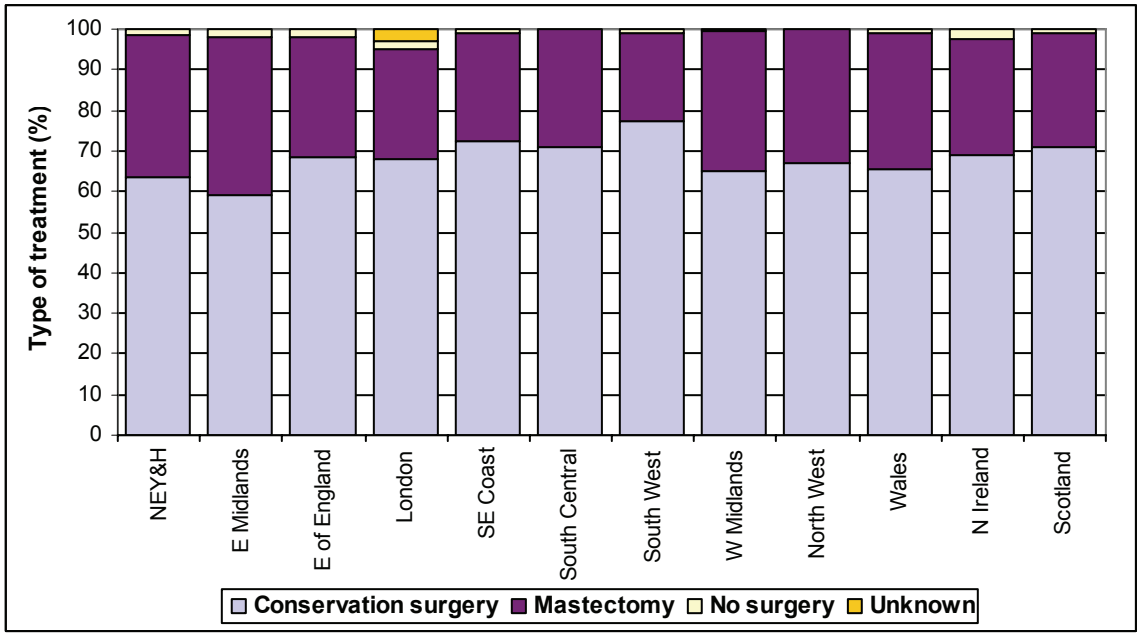

Figure 15 (Table 21): Variation in treatment for non-invasive and micro-invasive cancers

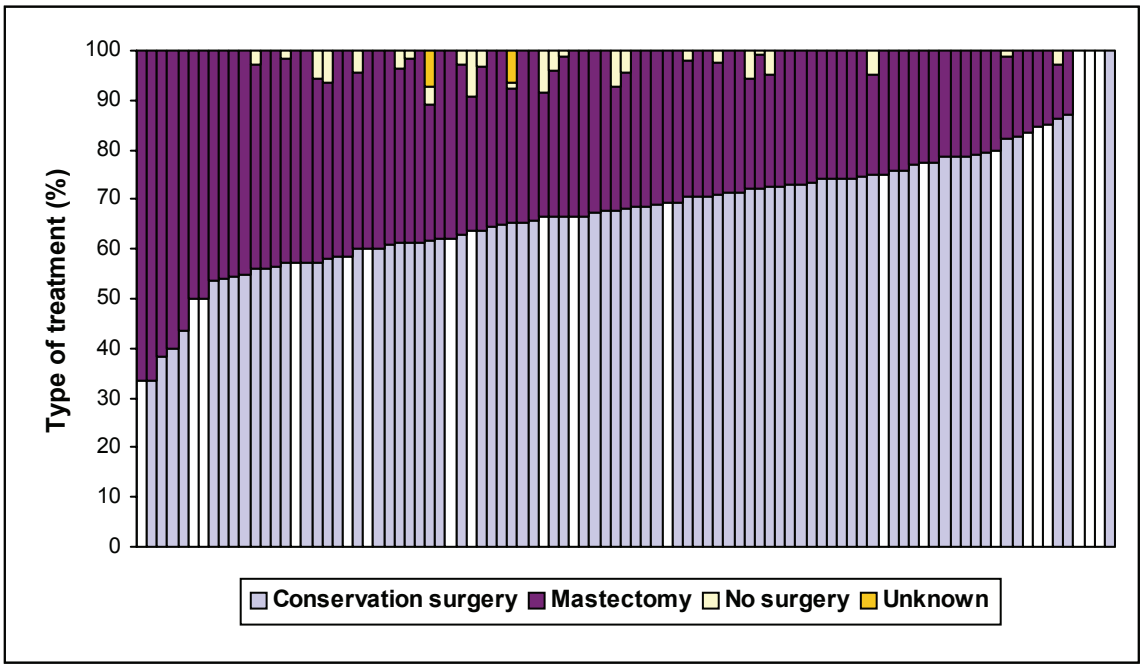

Figure 16: Variation in treatment for non-invasive and micro-invasive cancers in each screening unit. The 20 smallest units are highlighted in white

In Figure 16, the 20 smallest screening units are highlighted in white. Conservation surgery rates in individual screening units varied between 33% and 100%. One of the 5 units with conservation surgery rates under 50% was a small unit which treated a total of 6 non-invasive or micro-invasive cancers. The 3 small units with 100% conservation surgery treated a total of 1, 6 and 9 non-invasive or micro-invasive cancers in the audit period.

3.2 Cytonuclear Grade and Size for Non-invasive Breast Cancer

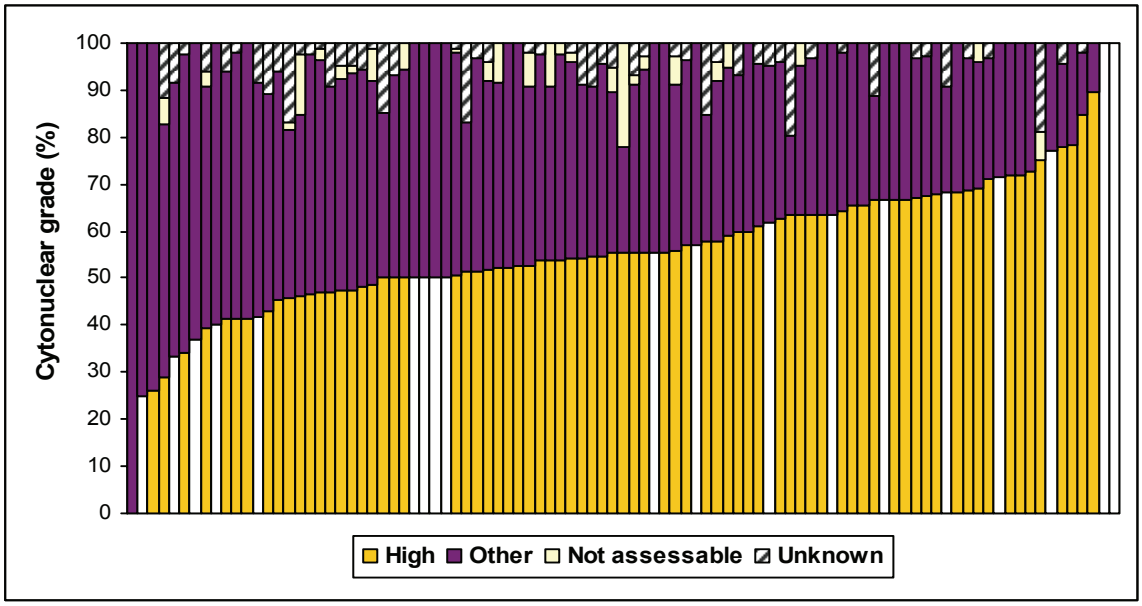

Figure 17: Variation in the cytonuclear grade of non-invasive cancers in each screening unit. Smaller units are highlighted in white

In the UK as a whole, 1,768 (57%) of the 3,122 surgically treated non-invasive cancers had high cytonuclear grade, 1,206 (39%) had other cytonuclear grade and for 60 (2%) the cytonuclear grade was not assessable (Table 22). Of the 88 non-invasive cancers (3%) with unknown cytonuclear grade, 22 (25%) cases were in London. The variation in the cytonuclear grade of non-invasive cancers in each screening unit is shown in Figure 17. The 2 units with the greatest proportion of high cytonuclear grade cancers treated 2 and 6 non-invasive cases in the audit period. The unit which had no high cytonuclear grade cancers is a small unit which treated only 1 non-invasive cancer in the audit period.

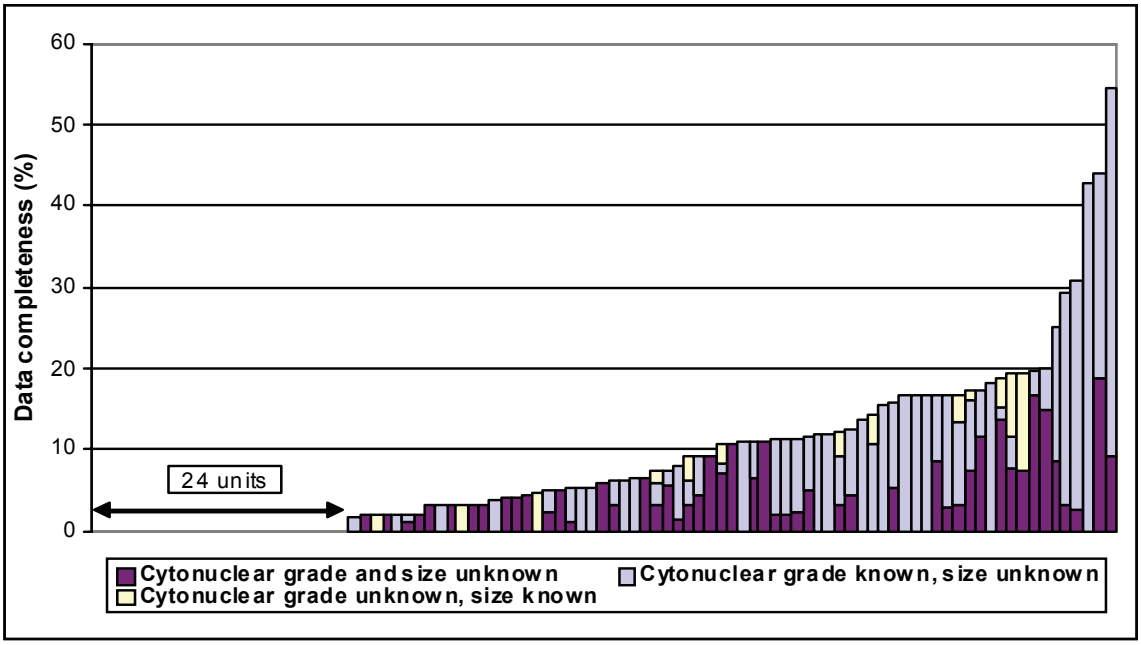

Figure 18: Variation in the data completeness of cytonuclear grade and size for non-invasive cancers in each screening unit

Figure 18 shows the data completeness for non-invasive cancers at each screening unit, excluding the cases that were not surgically treated. Although 42 units were able to supply the cytonuclear grade for all their cases, the number of screening units with complete cytonuclear grade and size decreased from 42 units in 2004/05 to 24 units in 2005/06. Overall, data were incomplete (unknown cytonuclear grade and/or size) for 238 (8%) of all surgically treated non-invasive cancers. Data completeness varied from 1% unknown in East Midlands to 16% in Wales (Table 24).

6 YEAR COMPARISON: DATA COMPLETENESS FOR NON-INVASIVE CANCERS (%)

Year of data collection	Unknown cytonuclear grade	Unknown size	Unknown cytonuclear grade and/or size
2000/01	7	12	14
2001/02	11	13	20
2002/03	11	15	21
2003/04	4	12	13
2004/05	1	7	7
2005/06	3	7	8

* Data for 2 units from East of England are absent in 2004/05. From 2004/05 onwards cases which were not surgically treated are excluded.

The summary table above shows that data completeness for non-invasive cancers has improved markedly since 2000/01. QA reference centres should identify which of their units are participating in the Sloane Project to ascertain if their practices and procedures could be used to improve data quality in other screening units. In addition, 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.

NUMBER OF NON-INVASIVE CANCERS TREATED WITH CONSERVATION SURGERY

	30+mm		Unknown size		
Region	High cytonuclear grade (Table 27)	Unknown cytonuclear grade	High cytonuclear grade (Table 25)	Unknown cytonuclear grade (Table 26)	Total*
N East, Yorks & Humber	20	0	5	7	32
East Midlands	12	0	0	3	15
East of England	11	0	3	1	15
London	14	0	2	13	29
South East Coast	16	0	4	5	25
South Central	12	1	2	5	20
South West	18	1	4	9	32
West Midlands	15	0	2	0	17
North West	10	0	6	3	19
Wales	7	0	5	1	13
Northern Ireland	0	0	2	3	5
Scotland	13	3	3	4	23
United Kingdom	**148**	**5**	**38**	**54**	**245**

*Each non-invasive cancer is counted once only

481 non-invasive cancers were recorded as large (30+mm), high cytonuclear grade lesions. Of these, 148 (31%) were treated with conservation surgery (Table 27). The summary table above shows that, in total, 245 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.

COMMENT:

- Overall, 68% of non-invasive and micro-invasive cancers were treated with conservation surgery, varying from 59% in East Midlands to 77% in South West
- The completeness of grade and size data has improved since 2000/01, with only 8% of cases having an unknown cytonuclear grade and/or size, 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.
- 245 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 Cancer

Of the 12,600 invasive breast cancers detected by the UK NHSBSP in 2005/06, 9,056 (72%) underwent conservation surgery, 3,327 (26%) had a mastectomy and 201 cases (2%) had no surgery. Treatment information was unavailable for 16 cases, of which 14 (88%) were in London. The QA reference centre should ascertain why these data were not available. Figure 19 shows the regional variation in invasive cancer mastectomy rates which ranged from 21% in Northern Ireland to 31% in East Midlands and 32% in North East Yorkshire & Humber region. Mastectomy rates in individual screening units varied between 12% and 50%.

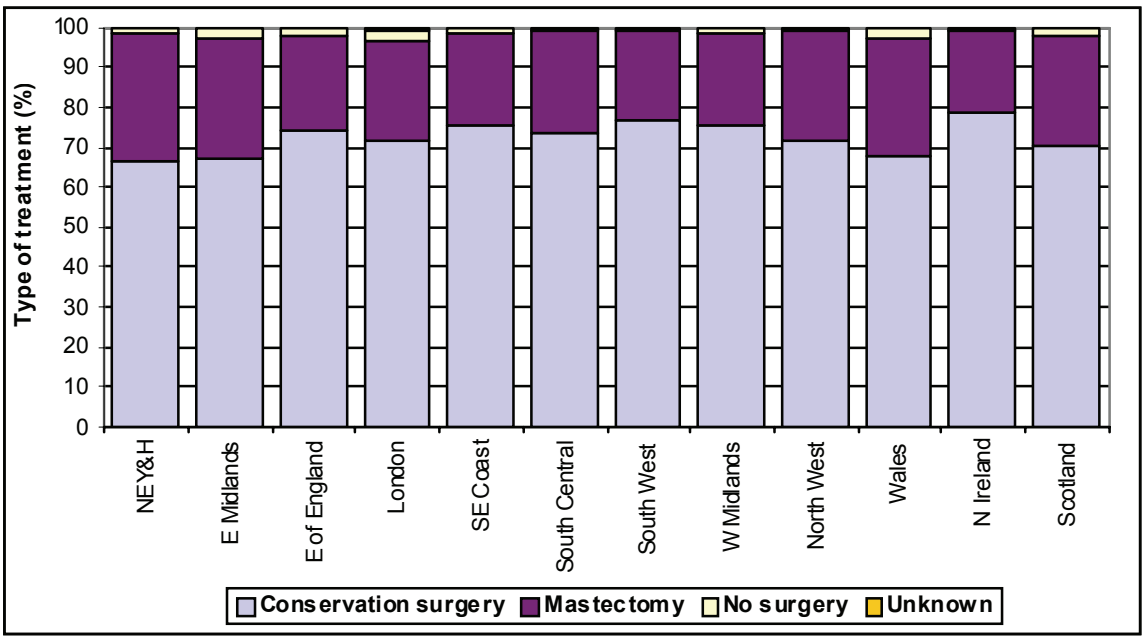

Figure 19 (Table 28): Variation in the type of treatment for invasive cancers (all sizes)

3.3.1 Treatment of Invasive Cancers According to Invasive Size

Of the 12,600 invasive cancers, 3,161 (25%) measured less than 10mm, 3,517 (28%) were 10-<15mm in diameter, 2,439 (19%) were 15-<20mm in diameter and 2,990 (24%) were 20-<50mm in diameter. Only 198 cases (2%) were 50mm or more in diameter (Table 29). For 94 surgically treated cases, size was unavailable. 31 (33%) of these were in London.

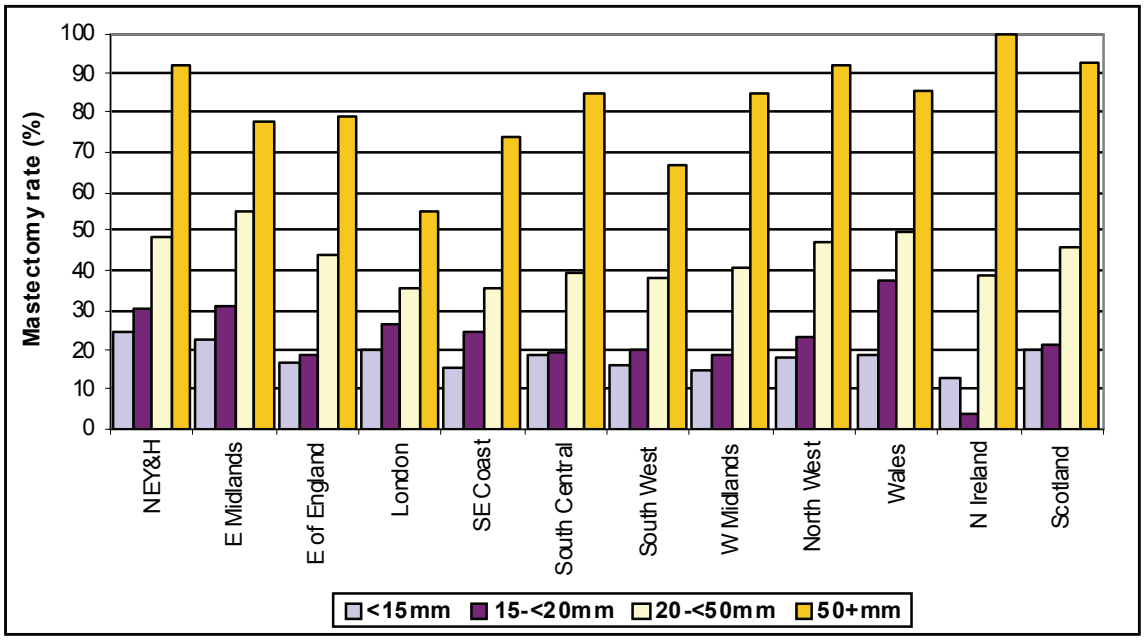

Figure 20 (Tables 32-35): Variation in mastectomy rates with invasive tumour size

In most regions there was a clear variation in mastectomy rate with tumour size, but in South Central and Scotland, there was relatively little difference in the mastectomy rates for cancers with diameter below 20mm. London and South West had relatively low mastectomy rates for cancers with invasive size 50mm or above, with only 56% and 67% of cancers respectively treated with mastectomy compared to 82% 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 32 shows that the highest mastectomy rates for small (<15mm) invasive cancers were seen in North East Yorkshire & Humber region (24%) and East Midlands (22%) and the lowest rates (13%) in Northern Ireland (14 cases).

10 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

*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 size was not provided for 801 (6%) of the 12,600 invasive cancers (Table 36), which is a slight improvement compared with last year when 7% of the invasive cancers did not have a whole size provided. 222 (28%) of the cancers without a whole size were in South Central, 174 (22%) were in London and 116 (14%) were in North East Yorkshire & Humber. The QA reference centres in these regions should ascertain why these important data were not available from their screening units.

Table 37 shows the whole size of small (<15mm) invasive cancers. Of the 6,678 invasive cancers with invasive size <15mm, 4,930 (74%) had whole size <15mm, 603 (9%) had whole size 15-<20mm, 727 (11%) had whole size 20-<50mm and 143 (2%) had whole size 50+mm. Whole size was unknown for 275 cancers (4%). 103 (37%) of these cancers were in South Central, 58 (21%) were in London, 50(18%) were in South East Coast and 48 (17%) were in North East, Yorkshire & Humber.

TREATMENT FOR INVASIVE CANCERS				
	Mastectomy rates for cancers with invasive size <15mm to 50+mm (Tables 32-35)		Mastectomy rates for <15mm invasive cancers with whole size <15mm to 50+mm (Tables 38, 40-42)	
Size	No.	%	No.	%
50+mm	163	82	123	86
20-<50mm	1,297	43	280	39
15-<20mm	588	24	110	18
<15mm	1,254	19	684	14

The summary table above shows how overall mastectomy rates varied with the size of the invasive cancer and with whole tumour size. The mastectomy rate for 50+mm invasive cancers (82%) was slightly lower than that for <15mm cancers with 50+mm whole size (86%). The mastectomy rates for invasive size 20-<50mm and 15-<20mm cancers were higher than for <15mm invasive cancers with 20-<50mm and 15-<20mm whole size respectively. For small cancers, only 14% of cancers with whole size <15mm were treated with mastectomy compared with 19% of cancers with invasive size <15mm. These data suggest that the presence of *in situ* disease accounts for a proportion of the mastectomies performed on cancers with invasive size <15mm.

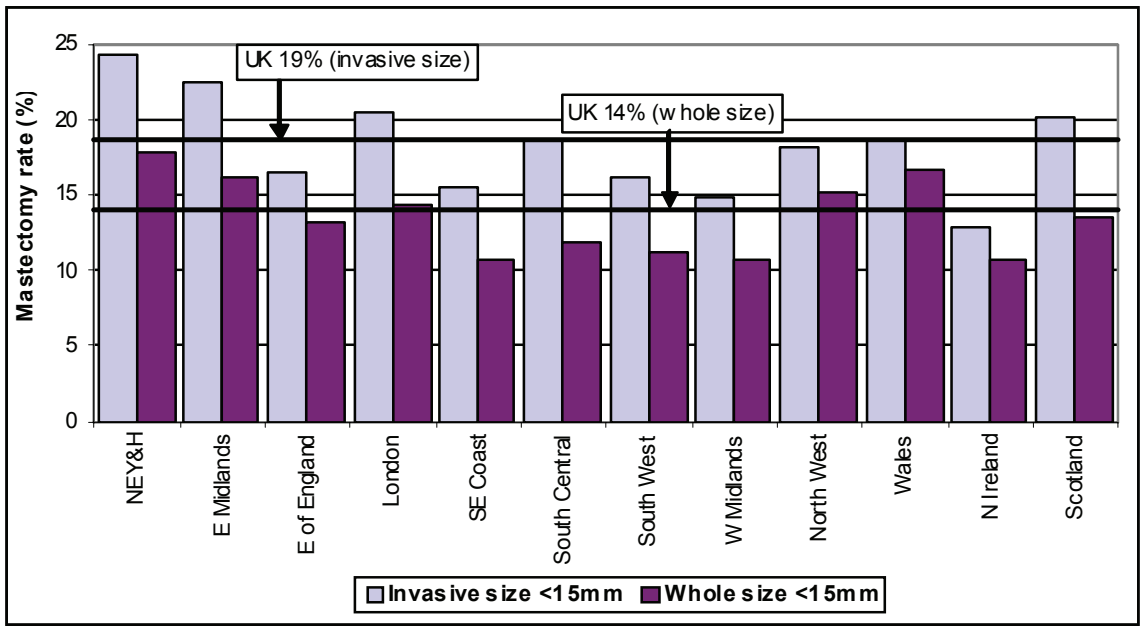

Figure 21 (Tables 32, 38): Variation in the mastectomy rates for cancers with <15mm invasive size and cancers with whole size and invasive size <15mm

Figure 21 illustrates the regional variation in mastectomy rates for cancers with invasive size <15mm and for cancers where the whole tumour size was <15mm. In every region, the mastectomy rate for cancers with whole tumour size <15mm was lower than that for cancers with invasive size <15mm. The difference was greatest in South Central (19% compared to 12%) and Scotland (20% compared to 14%), and least in Northern Ireland (13% compared to 11%) and Wales (19% compared to 17%).

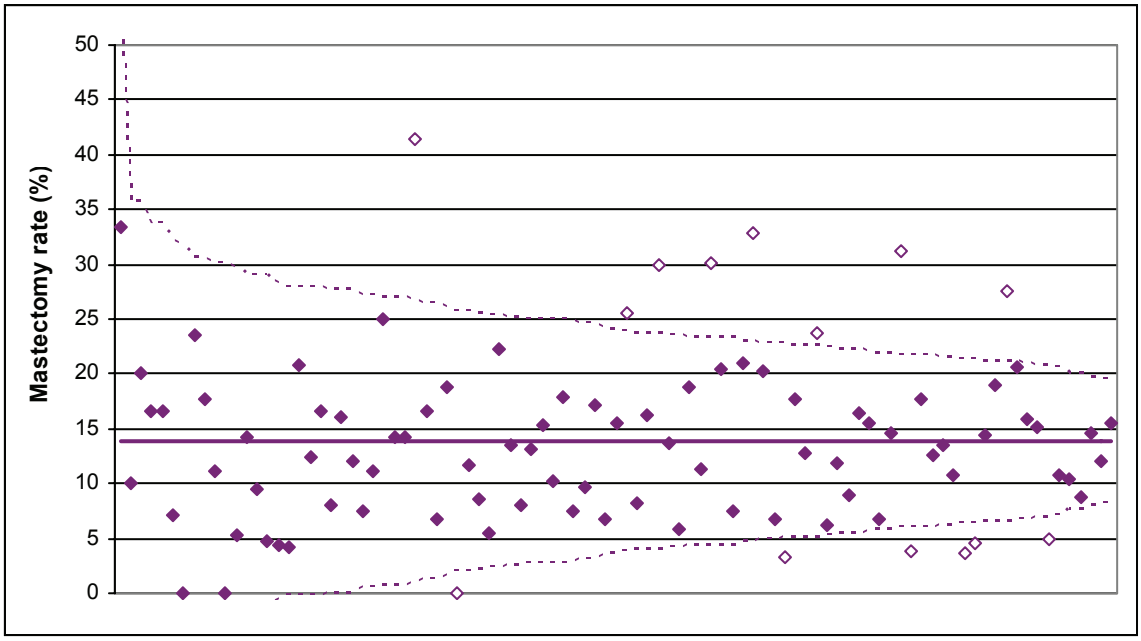

Figure 22: Variation in the mastectomy rates for cancers with whole size and invasive size <15mm in each screening unit (open diamond shapes represent units which lie outside the control limits)

Figure 22 uses a control chart to demonstrate the variation between screening units in the mastectomy rates for invasive cancers with whole size less than 15mm. The 2 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 (6 units) than the average. In a unit from the West Midlands, 41% of the small cancers with whole size <15mm had a mastectomy. Only 2 of these cases (7%) had immediate reconstruction. There were 3 units from other regions which had a higher than 30% mastectomy rate for small tumours with whole size <15mm and where no immediate reconstruction was recorded. 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.

3.4 Immediate Reconstruction Following Mastectomy

Overall, of the 15,944 cancers detected, 4,338 (27%) were treated with mastectomy. Of these, only 499 (12%) were recorded as having immediate reconstruction. 2,808 (65%) cases had no immediate reconstruction recorded and for 1,031 (24%) cases it was unknown whether immediate reconstruction was performed. Information regarding delayed reconstruction was not collected.

Table 44 shows that, of the 499 cases known to have had immediate reconstruction following mastectomy, 274 (55%) were invasive, 11 (2%) were micro-invasive and 214 (43%) were non-invasive. Thus, 8.2% of the 3,327 invasive cancers treated with mastectomy (Table 28) had immediate reconstruction recorded compared with 22.3% of the 1,010 non-invasive and micro-invasive cancers treated with mastectomy (Table 21). For invasive cancers treated with mastectomy, recorded immediate reconstruction rates varied from 0% in Northern Ireland to 18% in South East Coast. For non-invasive cancers treated with mastectomy, recorded immediate reconstruction rates varied from 13% in South West to 36% in South East Coast.

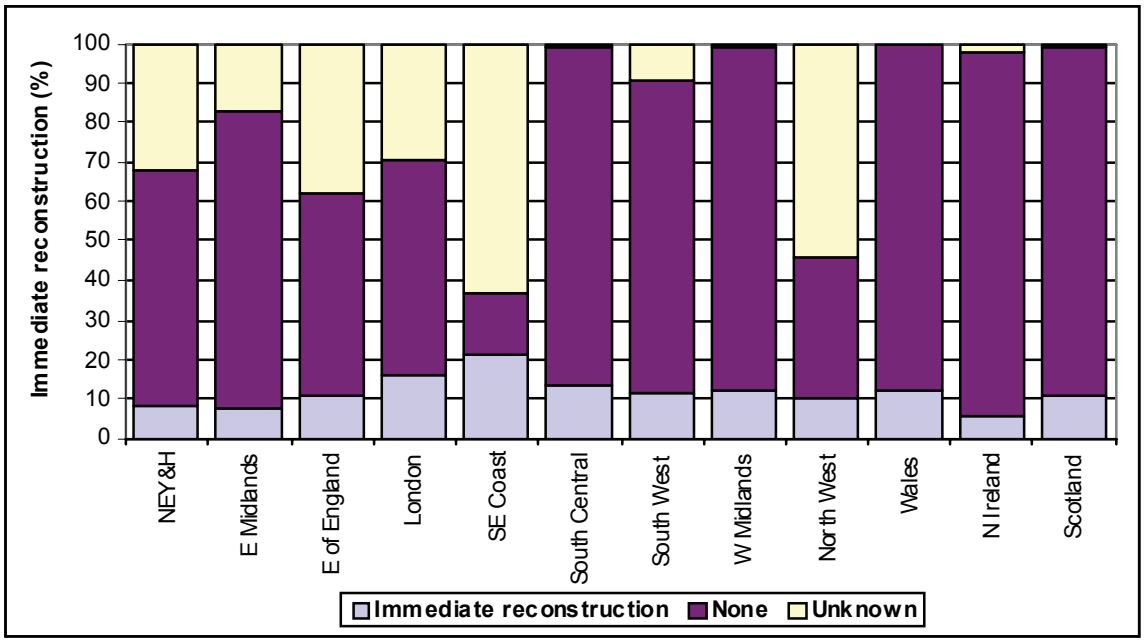

Figure 23 (Table 43): Proportion of cancers having immediate reconstruction after mastectomy

Figure 24 shows that recorded immediate reconstruction rates varied widely (from 2% to 33%) in individual screening units. Immediate reconstruction data were not recorded in 33 screening units.

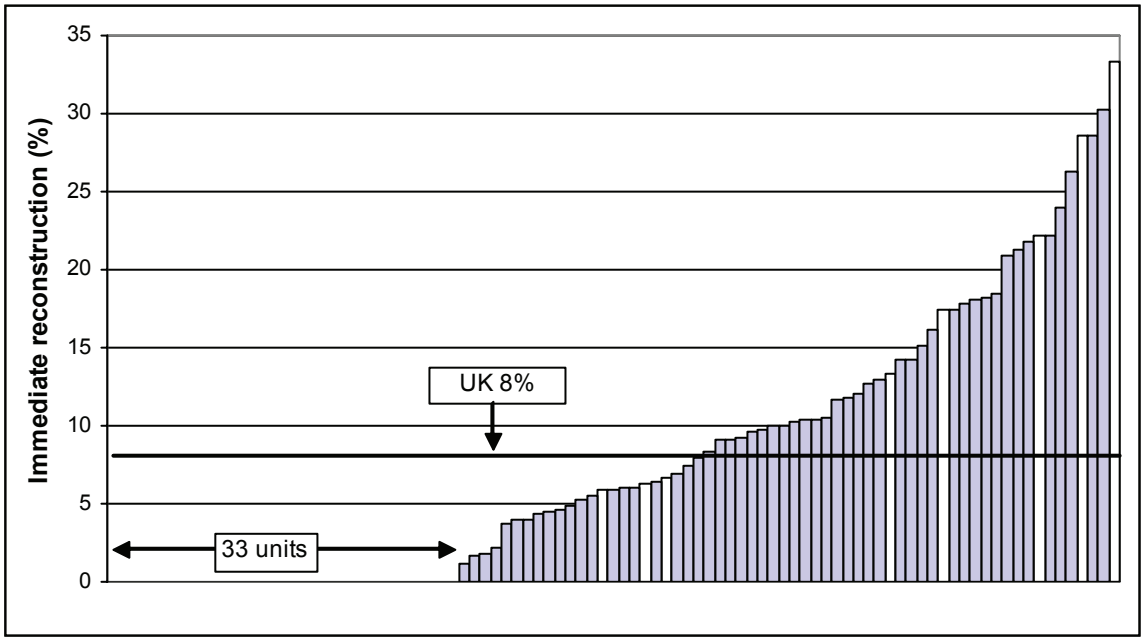

Figure 24: Variation in the proportion of immediate reconstruction in each screening unit. Smaller units are highlighted in white

COMMENT:

- In the UK as a whole, the mastectomy rate for invasive cancers was 26%. This varied between 12% and 50% in individual screening units.
- 82% of 50+mm invasive cancers were treated with mastectomy compared with 19% of small (<15mm) invasive cancers. In most regions there was a clear variation in mastectomy rate with tumour size, but in South Central and Scotland, there was relatively little difference in the mastectomy rates for cancers with diameters below 20mm.

COMMENT:

- London and South West had relatively low mastectomy rates for cancers with invasive size 50mm or above with only 56% and 67% of cancers respectively treated with mastectomy compared to 82% 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 size was not provided for 801 (6%) invasive cancers.
- 222 (28%) of the cancers without a whole size were in South Central, 174 (22%) were in London and 116 (14%) were in North East Yorkshire & Humber. The QA reference centres in these regions should ascertain why these important data were not available from their screening units.
- Only 14% of cancers with whole size <15mm were treated with mastectomy compared with 19% of cancers with invasive size <15mm. These data suggest that the presence of *in situ* disease accounts for a proportion of the mastectomies performed on tumours with invasive size <15mm.
- 12% of cancers treated with mastectomy were recorded as having immediate reconstruction. Of these cancers, 274 (55%) were invasive, 11 (2%) were micro-invasive, and 214 (43%) were non-invasive.
- 8.2% of invasive cancers treated with mastectomy were recorded as having immediate reconstruction compared with 22.3% of micro-invasive and non-invasive cancers treated with mastectomy.
- In a unit from the West Midlands, 41% of the small cancers with whole size <15mm had a mastectomy. Only 2 of these cases (7%) had immediate reconstruction. There were 3 units from other regions which had a higher than 30% mastectomy rate for small tumours with whole size <15mm and where no immediate reconstruction was recorded. 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 to ascertain the reasons for this non-random variation in clinical practice.

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 enable the accurate calculation of 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. These data are provided only for cases who had a non-operative diagnosis (94% of the 15,944 cases included in the audit), as only these cases had the date of the first therapeutic operation recorded. Data for the 944 cases who did not have a non-operative diagnosis are presented separately in Table 45. 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 46). For cases which did not have a non-operative diagnosis, only 87% of women had their first diagnostic operation within 2 month of their first assessment visit, with a median waiting time of 36 days (Table 45). 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 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 but South East Coast met the minimum standard. In the UK as whole, 56% of the women had their first therapeutic treatment within 1 month of their first assessment visit. Performance was especially good in Northern Ireland where 82% of women had their first therapeutic treatment within 1 month of their first assessment visit.

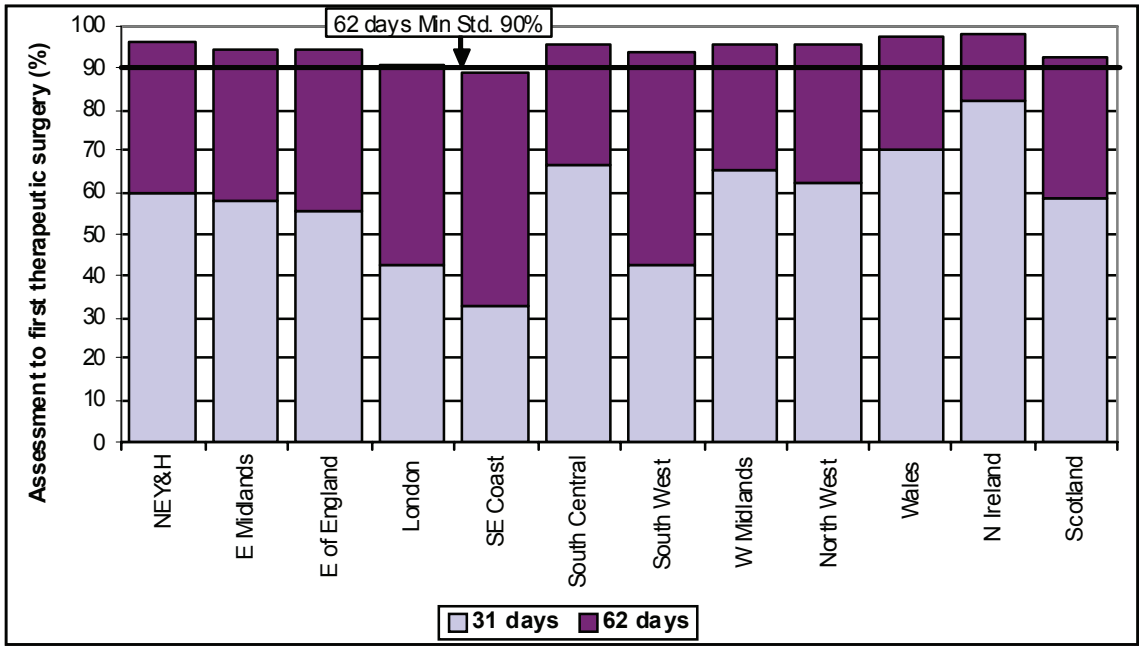

Figure 25 (Table 46) : Percentage of women who had their first therapeutic surgery within 31 days and 62 days of attending an assessment clinic

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, 69% of women had their first therapeutic surgery within 62 days (2 months) of their screening visit, with a median of 52 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 East of England and London, only 52% of women received their first therapeutic surgery within 62 days of their screening visit. In South Central this figure was 88%.

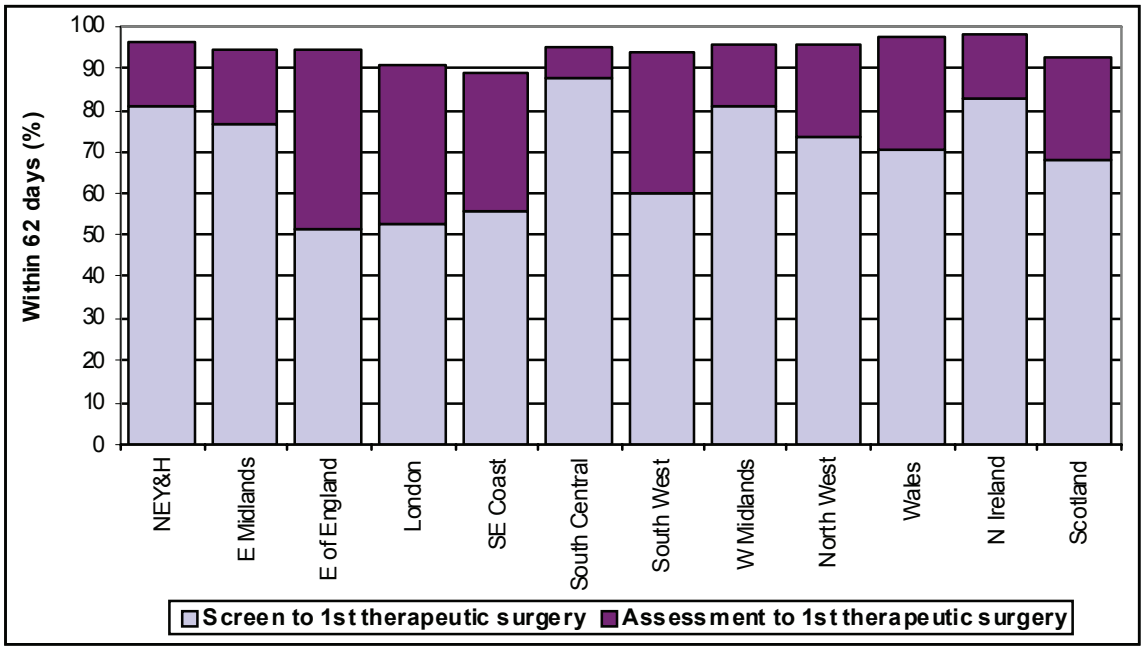

Figure 26 (Tables 46 & 47) : Percentage of women who had their first therapeutic surgery within 62 days of their screening or assessment visit

COMMENT:

- 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 but South East Coast met the minimum standard that 90% of women should have their first therapeutic treatment within 2 months of their first assessment visit.
- 69% of women had their first therapeutic surgery within 2 months of their screening visit. This varied between 52% in East of England and London and 88% in South Central.

CHAPTER 5
LYMPH NODE STATUS, INVASVIVE GRADE AND NPI

201 invasive cancers which did not have surgery (Table 28) 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 92% in London to 99% in East Midlands, West Midlands, Wales, Scotland, and North East Yorkshire & Humber (Table 48). In London and East of England, 89 (8%) and 55 (5%) invasive cancers respectively had either no nodes obtained or it was unknown if nodes had been obtained.

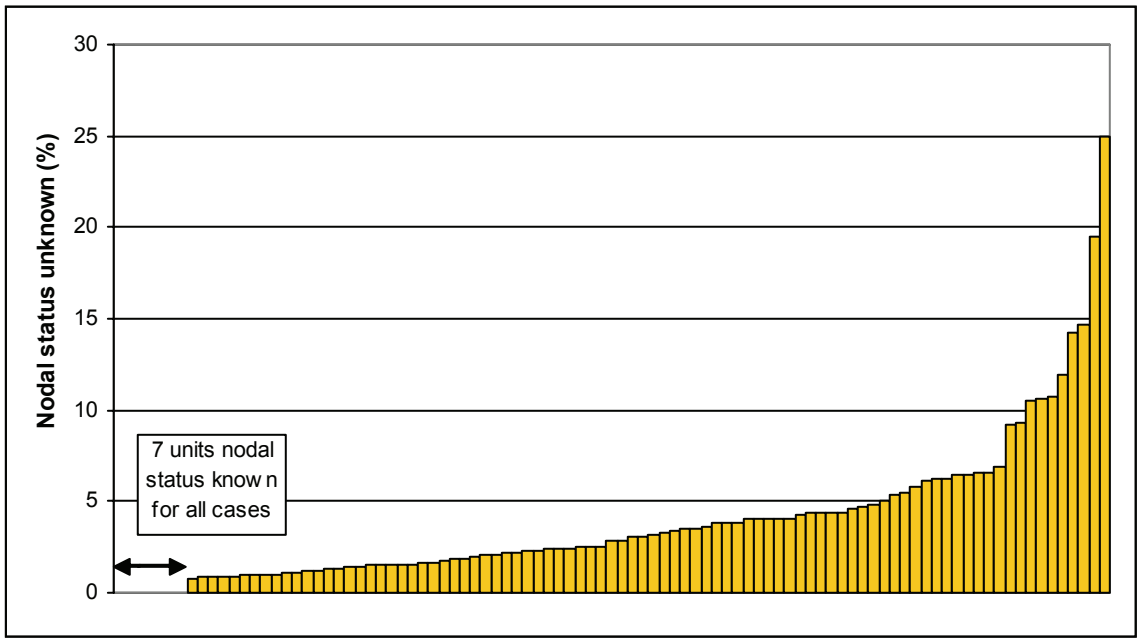

Figure 27: The availability of lymph node status for invasive breast cancers in each screening unit

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 nodal status was not recorded. Nodal status was ascertained for 100% of invasive cancers in 7 screening units. The screening unit which had 78% of cases with unknown nodal status in 2004/05 has improved its data quality and had less than 1% of cases with unknown nodal status in 2005/06. Regional QA reference centres with screening units with more than 10% 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)

For the 12,063 invasive cancers with axillary surgery, 2,859 (24%) cancers involved a sentinel lymph node procedure and 7,029 (58%) did not involve a sentinel procedure (Table 49). The table below shows the predominant axillary technique used in 2005/06 by surgeons who had a caseload of 10 or more. In the UK as a whole, 27% of surgeons performed the full sentinel lymph node procedure using isotope and blue dye. This varied from 0% in South East Coast and Northern Ireland to 56% in East of England. A further 54 surgeons (15%) carried out blue dye guided 4 node sampling. This was used by 38% of the surgeons in Wales and this was used with the same frequency (27%) as the full sentinel lymph node procedure in Scotland. A small proportion of surgeons carried out a sentinel node procedure involving blue dye only (5%) or isotope only (1%). 134 surgeons (37%) did not carry out sentinel lymph node procedures in 2005/06 and utilised other axillary techniques such as clearance and sampling.

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*
N East, Yorks & Humber	*22*	*7*	*0*	*17*	*48*
East Midlands	*44*	*0*	*8*	*12*	*36*
East of England	*56*	*14*	*0*	*19*	*11*
London	*26*	*7*	*0*	*24*	*26*
South East Coast	*0*	*0*	*0*	*0*	*3*
South Central	*42*	*8*	*0*	*0*	*50*
South West	*15*	*6*	*0*	*12*	*67*
West Midlands	*30*	*5*	*0*	*14*	*46*
North West	*21*	*0*	*0*	*13*	*28*
Wales	*15*	*0*	*0*	*38*	*46*
Northern Ireland	*0*	*0*	*0*	*0*	*80*
Scotland	*27*	*8*	*0*	*27*	*38*
UK	***27***	***5***	***1***	***15***	***37***

The median number of nodes examined for cases with and without a sentinel lymph node procedure was 4 nodes and 8 nodes respectively (Table 50). There were 2,175 cases recorded as unknown sentinel lymph node procedure. 603 (28%) of these were from North West and 456 (21%) from Wales. Regional QA reference centres should investigate why, in such a relatively high proportion of

cases, it was not known whether or not a sentinel lymph node procedure had been performed.

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. However, from 2004/05 onwards, this figure rises again because of the increased use of sentinel lymph node procedures. In 2005/06 when a sentinel lymph node procedure was recorded for 2,859 invasive cancers (Table 49), the proportion of cases with less than 4 nodes examined increased to 13.4%. 8.8% of these cases involved a sentinel lymph node procedure, leaving an underlying rate of 4.6% with less than 4 nodes examined when a sentinel lymph node procedure was not used. In 2004/05, the overall proportion of cases with less than 4 nodes examined was 8.6%, with 4.1% accounted for by the use of a sentinel lymph node procedure and an underlying rate of 4.5%.

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

*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 Lymph Node Status

Of the 12,063 invasive cancers with known nodal status, 2,743 (23%) had positive nodes (Table 52). The summary table below shows a slight decrease in the last 2 years in the proportion of cases with positive nodes. This may be related to the age expansion, because as shown in the second table, the proportion of cases with positive nodal status is lower in women aged 65 years and older.

6 YEAR COMPARISON:
AVAILABILITY OF LYMPH NODE STATUS

Year of data collection	Number of invasive cancers	% with nodal information	% of invasive cancers with known nodal status	
			Positive	Negative
2000/01	7,945	93	25	75
2001/02	7,911	94	25	75
2002/03	9,086	95	25	75
2003/04	10,400	94	24	76
2004/05*	10,848	95	23	77
2005/06*	12,399	97	23	77

*Data for 2 units from East of England are absent in 2004/05. From 2004/05 onwards cases which did not receive surgical treatment are excluded

VARIATION IN LYMPH NODE STATUS WITH AGE			
Age	Number of invasive cancers	% of invasive cancers with known nodal status	
		Positive	Negative
<50	150	27	73
50-64	8,074	24	76
65-70	3,455	20	80
71+	720	22	78

There was some regional variation in lymph node status, with the proportion of node positive cancers varying from 20% in East Midlands to 25% in South East Coast and Scotland (Table 52). 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 6% (3 cancers) to 34% (35 cancers).

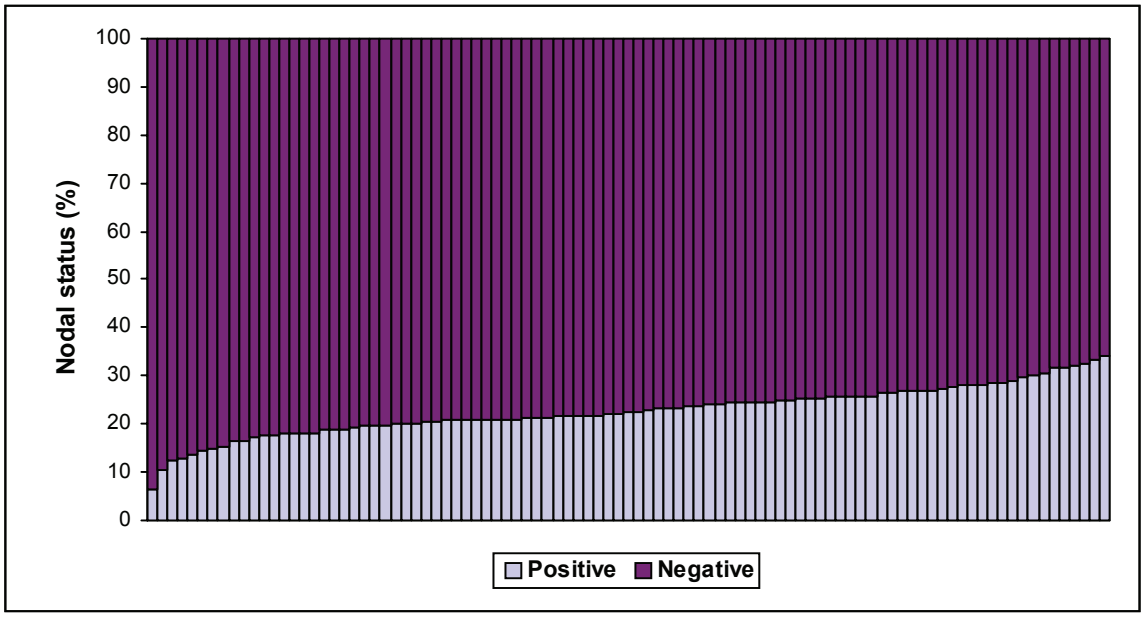

Figure 28: Variation in the lymph node status of invasive breast cancers in each screening unit

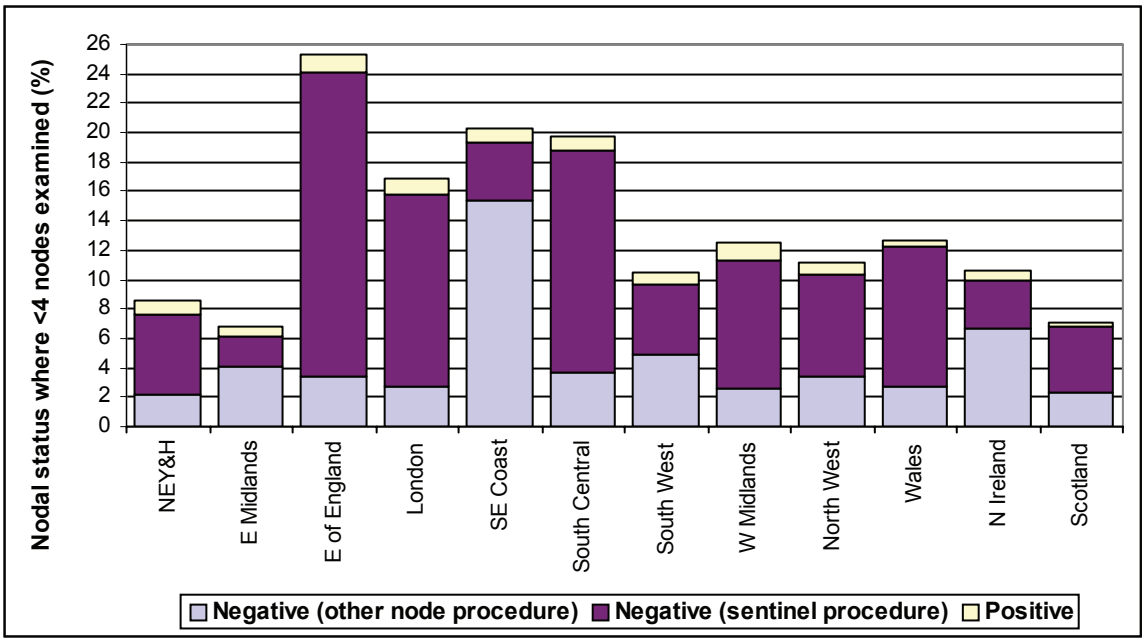

Figure 29 (Table 53): Nodal status for invasive cancers where nodal status was determined on the basis of <4 nodes, expressed as the percentage of invasive cancers with known nodal status

Overall, 505 (4.2%) 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 2.2% (35 cancers) in North East Yorkshire & Humber to 15.3% (147 cancers) in South East Coast, where the majority are recorded as unknown sentinel lymph node procedure. A further 1,009 cancers (8.4%) had their negative nodal status determined by a sentinel node procedure. This varied from 2% (20 cancers) in East Midlands to 20.6% (232 cancers) in East of England.

Table 54 shows that the proportion of cases with positive nodal status is lower (18%) for cases who underwent a sentinel lymph node procedure compared with cases who did not receive a sentinel lymph node procedure (24%). This is consistent with the selection of patients who have palpable nodes or who have positive nodes on pre-operative ultrasound guided core biopsy for axillary sampling or clearance. Of the 518 cancers which had their positive nodal status determined from a sentinel lymph node procedure, only 203 (39%) had a subsequent axillary procedure (Table 55). For 263 cases (51%), 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. For 52 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 53 invasive cancers (0.4%) 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 less than four nodes taken at a single operation 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 48)*	***Negative <4 nodes*** *(Not sentinel procedure - Table 53)*	***Insufficient nodal information***	
Region	***No.***	***No.***	***No.***	***No.***	***%***
N East, Yorks & Humber	*1,618*	*16*	*35*	*51*	*3*
East Midlands	*995*	*13*	*40*	*53*	*5*
East of England	*1,180*	*56*	*39*	*95*	*8*
London	*1,105*	*89*	*27*	*116*	*10*
South East Coast	*1,011*	*52*	*147*	*199*	*20*
South Central	*942*	*17*	*34*	*51*	*5*
South West	*1,224*	*27*	*58*	*85*	*7*
West Midlands	*1,122*	*11*	*29*	*40*	*4*
North West	*1,319*	*37*	*43*	*80*	*6*
Wales	*640*	*6*	*17*	*23*	*4*
Northern Ireland	*186*	*6*	*12*	*18*	*10*
Scotland	*1,057*	*6*	*24*	*30*	*3*
UK	***12,399***	***336***	***505***	***841***	***7***

The table above shows that of the 12,399 surgically treated invasive cancers, 336 (3%) had unknown nodal status and that 505 (4%) had their negative nodal status determined on the basis of 1, 2 or 3 nodes without a sentinel lymph node procedure. Thus, 841 (7%) of the 12,399 invasive cancers detected appear to have insufficient nodal information to provide a satisfactory diagnostic work-up. This proportion varied from 3% in Scotland and North East Yorkshire & Humber to 20% in South East Coast. 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 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 48%. 92% of the invasive cases in one screening unit in South East Coast had no sentinel lymph node procedure information provided. This is probably the cause of the high proportion of invasive cancers in this unit which appear to have had their negative nodal status determined on the basis of less than 4 nodes without a sentinel lymph node procedure.

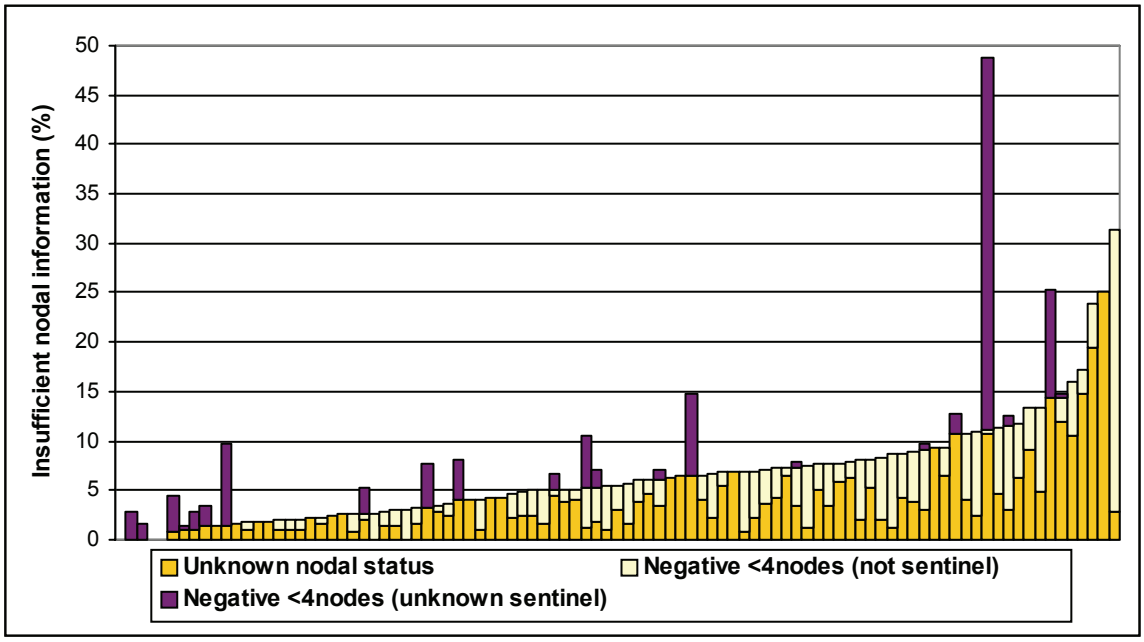

Figure 30: Proportion of invasive cancers with insufficient nodal information in each screening unit

COMMENT:

- In the UK as a whole, 97% of surgically treated invasive cancers had known nodal status. This varied between 92% in London to 99% in East Midlands, West Midlands, Wales, Scotland, and North East Yorkshire & Humber.
- In 7 screening units nodal status was ascertained for 100% of surgically treated invasive cancers. Regional QA reference centres with screening units with more than 10% of cases with unknown nodal status should audit the cases to determine the reasons for the absence of these important data.
- In the UK as a whole, 27% of surgeons performed the full sentinel lymph node procedure using isotope and blue dye. This varied from 0% in South East Coast and Northern Ireland to 56% in East of England.
- A further 54 surgeons (15%) carried out blue dye guided 4 node sampling. This was the predominant axillary technique used by surgeons in Wales (38%) and was used with the same frequency (27%) as the full sentinel lymph node procedure in Scotland.
- In 2005/06 when a sentinel lymph node procedure was recorded for 2,859 invasive cancers, the proportion of cases with less than 4 nodes examined was 13.4%. However, 8.7% of these cases involved a sentinel lymph node procedure, leaving an underlying rate of 4.7%
- In the UK as a whole, the proportion of cases with positive nodal status was again lower than in 2003/04. This may be related to the age expansion as the proportion of cases with positive nodal status is lower in women aged 65 years and older.
- 39% of the 518 cancers which had their positive nodal status determined from a sentinel lymph node procedure appear to have had a subsequent axillary procedure.
- For 52 cases, the positive nodal status was determined on the basis of fewer than 4 nodes as no subsequent axillary procedures were recorded. A further 53 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

Of the 3,122 surgically treated non-invasive cancers, 26% had known nodal status, varying from 18% in South West to 34% in North West and East Midlands (Table 56). For 1 non-invasive cancer, nodes were obtained but the nodal status was unknown. For 22 cases it was unknown whether or not nodes were taken. 10 of these cases were in London and 10 in South East Coast.

Of the 824 non-invasive cancers with known nodal status, 6 (1%) had positive nodal status recorded (Table 57). This is consistent with previous studies suggesting that 2% of non-invasive breast cancers have non-identified invasive disease removed during the diagnostic process. In the UK as a whole, the mean and median number of nodes examined for non-invasive cancers with known nodal status were both 5 (Table 58).

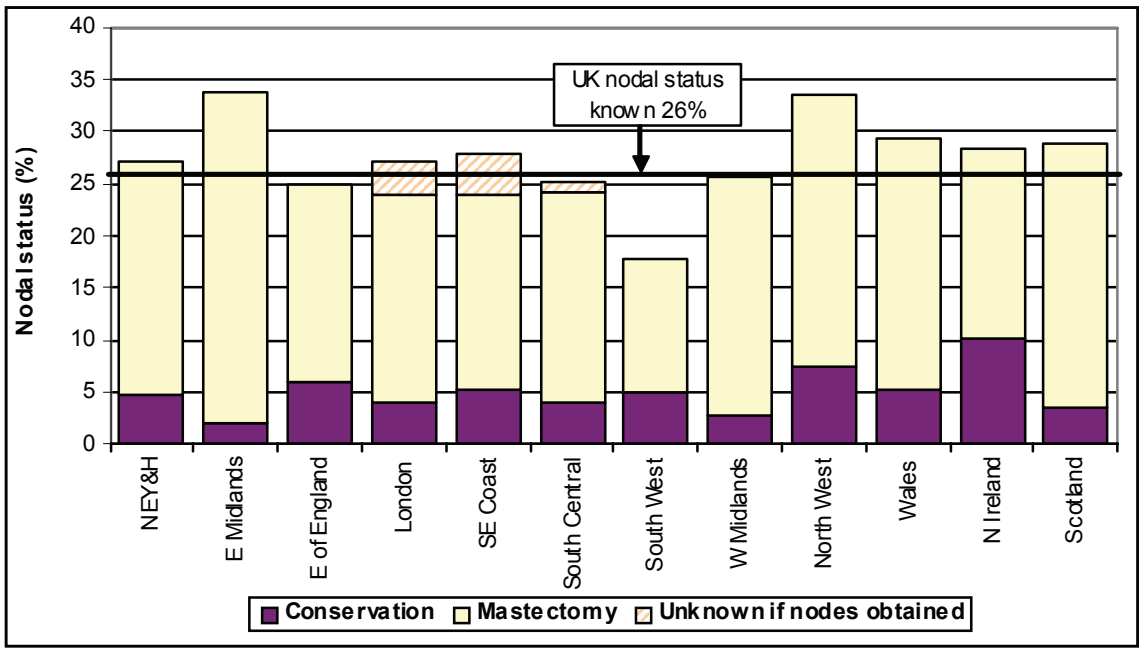

Figure 31: The proportion of non-invasive cancers treated with conservation surgery and mastectomy with known nodal status

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. 82% of the cases with known nodal status were treated by mastectomy. This varied from 64% in Northern Ireland to 94% in East Midlands. In the UK as a whole, 18% of cases treated with conservation surgery had known nodal status. This varied from 6% in East Midlands to 36% in Northern Ireland. 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 will increase.

Figure 32 shows the non-operative history for conservatively treated non-invasive cancers with known nodal status. In the UK as a whole, for 111 cancers (75%) 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. For 13 cases (9%), a B5b (Invasive) core biopsy predicted invasive disease, but the cancer was determined to be non-invasive following surgery. Nodes were therefore taken at surgery as recommended for the anticipated invasive disease. 12 cases (8%) had C5 cytology alone with no B5 core biopsy before proceeding to breast conservation with axillary surgery. For a further 5 cases, the core biopsy result was either that the tumour was not assessable or of unknown malignancy type and 7 cases had neither a C5 cytology nor a B5 core biopsy result prior to surgery.

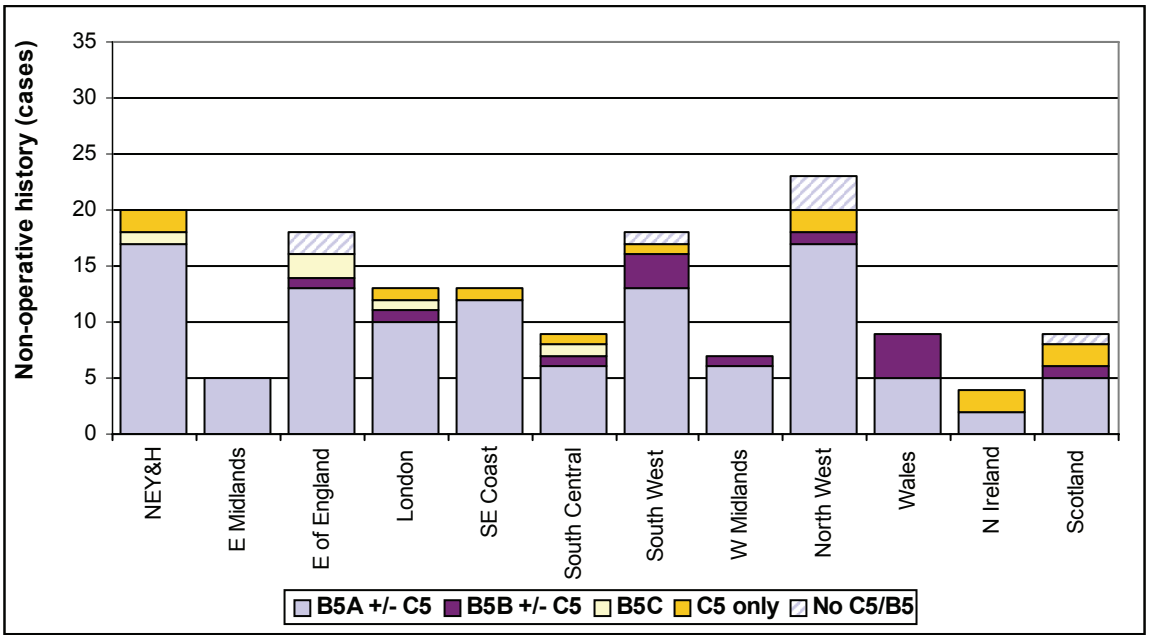

Figure 32 (Table 60): Non-operative history for non-invasive cancers with known nodal status treated by conservation surgery

COMMENT:

- Although nodal assessment is not usually indicated for non-invasive cancers, 26% of non-invasive cancers had known nodal status. This varied from 18% in South West to 34% in North West and East Midlands.
- 1% of non-invasive cancers with known nodal status had positive nodal status recorded. This is consistent with previous studies suggesting that 2% of non-invasive breast cancers have non-identified invasive disease removed during the diagnostic process.
- Non-invasive cancers treated with mastectomy were more likely to have lymph nodes removed during surgery than those treated with conservation surgery. However, 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 will increase.
- 75% of conservatively treated non-invasive cancers with known nodal status had non-invasive disease predicted by a B5a (Non-invasive) core biopsy. Radiological or clinical factors may have thus influenced the decision to take nodes for these cases.
- For 13 cases (9%) a B5b (Invasive) core biopsy predicted invasive disease but the invasive status of the cancer was determined to be non-invasive after surgery. Nodes were therefore taken at surgery as recommended for the anticipated invasive disease.

5.3 Grade of Invasive Cancers

Of the 12,399 invasive cancers which had surgery, 3,560 (29%) were Grade I, 6,226 (50%) were Grade II and 2,435 (20%) were Grade III (Table 61). Grade was not assessable for 87 cases (1%) and grade was unknown for 91 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.

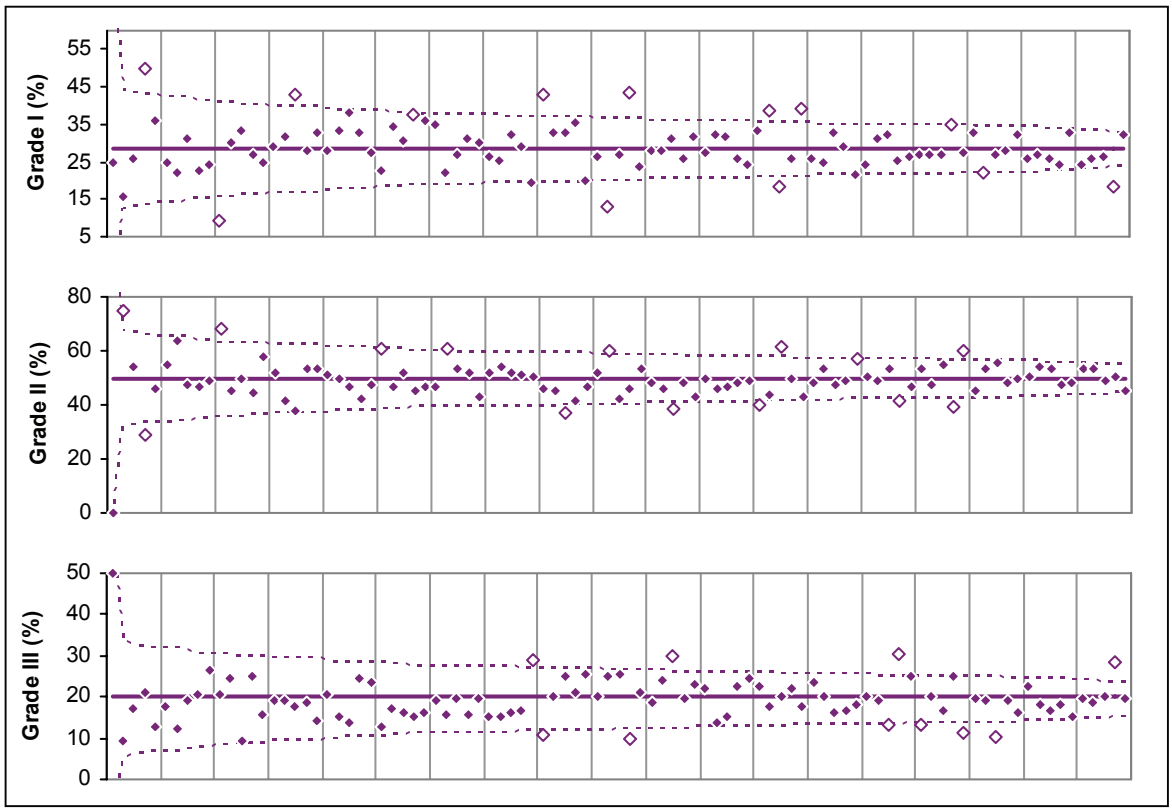

Figure 33: Variation in the grade of invasive cancers in each screening unit (open diamond shapes represent units which lie outside the control limits)

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 (≥4 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% (498 cases) of the 12,399 invasive cancers which had surgery. Figure 34 shows that the proportion of cancer with unknown NPI is the

lowest in Scotland, Wales, West Midlands and North East, Yorkshire & Humber and highest in London (10%). The high proportion of cancers with an unknown NPI score in London was largely due to unknown nodal status.

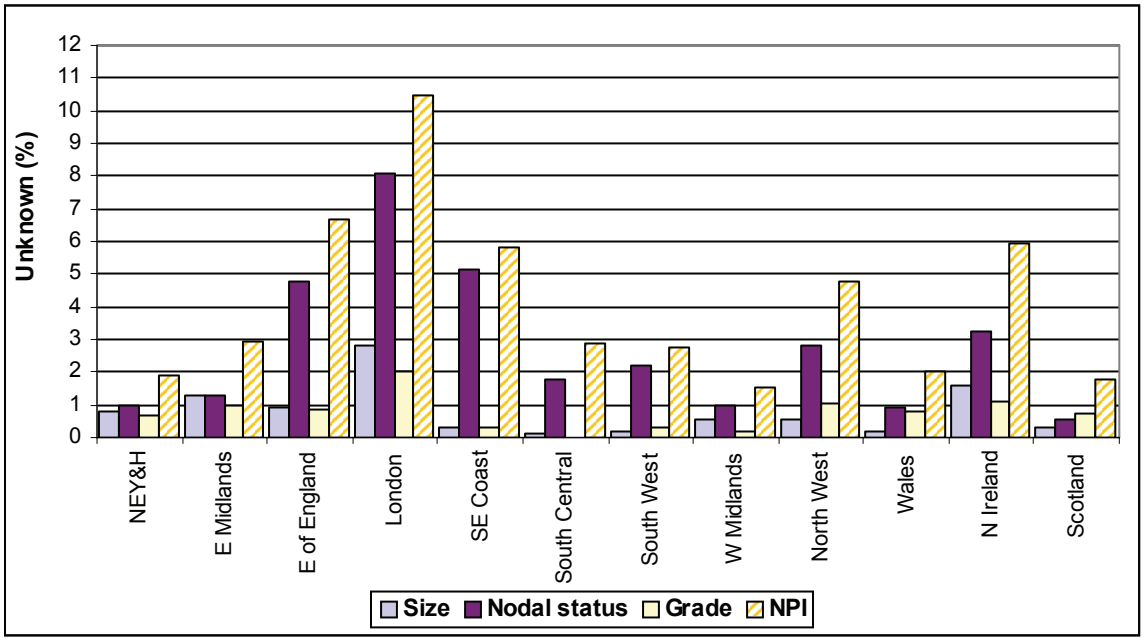

Figure 34 (Table 62): Data completeness of tumour characteristics of invasive cancers

Of the 11,901 surgically treated invasive cancers with known NPI score, the highest proportion fell into the Good Prognostic Group (37%), with only 6% (740 cases) in the Poor Prognostic Group. As expected with cancers detected by screening, the majority (60%) of cancers fell into the two best prognostic groups, EPG (Excellent Prognostic Group) and GPG (Good Prognostic Group). This varied from 54% in Scotland to 62% in East Midlands, South West and Northern Ireland (Table 63). The relatively low proportion of EPG and GPG cancers in Scotland is due to the high proportion of Grade III cancers compared with the UK as a whole (24% compared to 20%, Table 61).

In Figure 35, the proportion of invasive cancers for individual screening units in each 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% 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 10 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 3 units have a significantly higher or lower proportion of PPG cancers. 13 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.

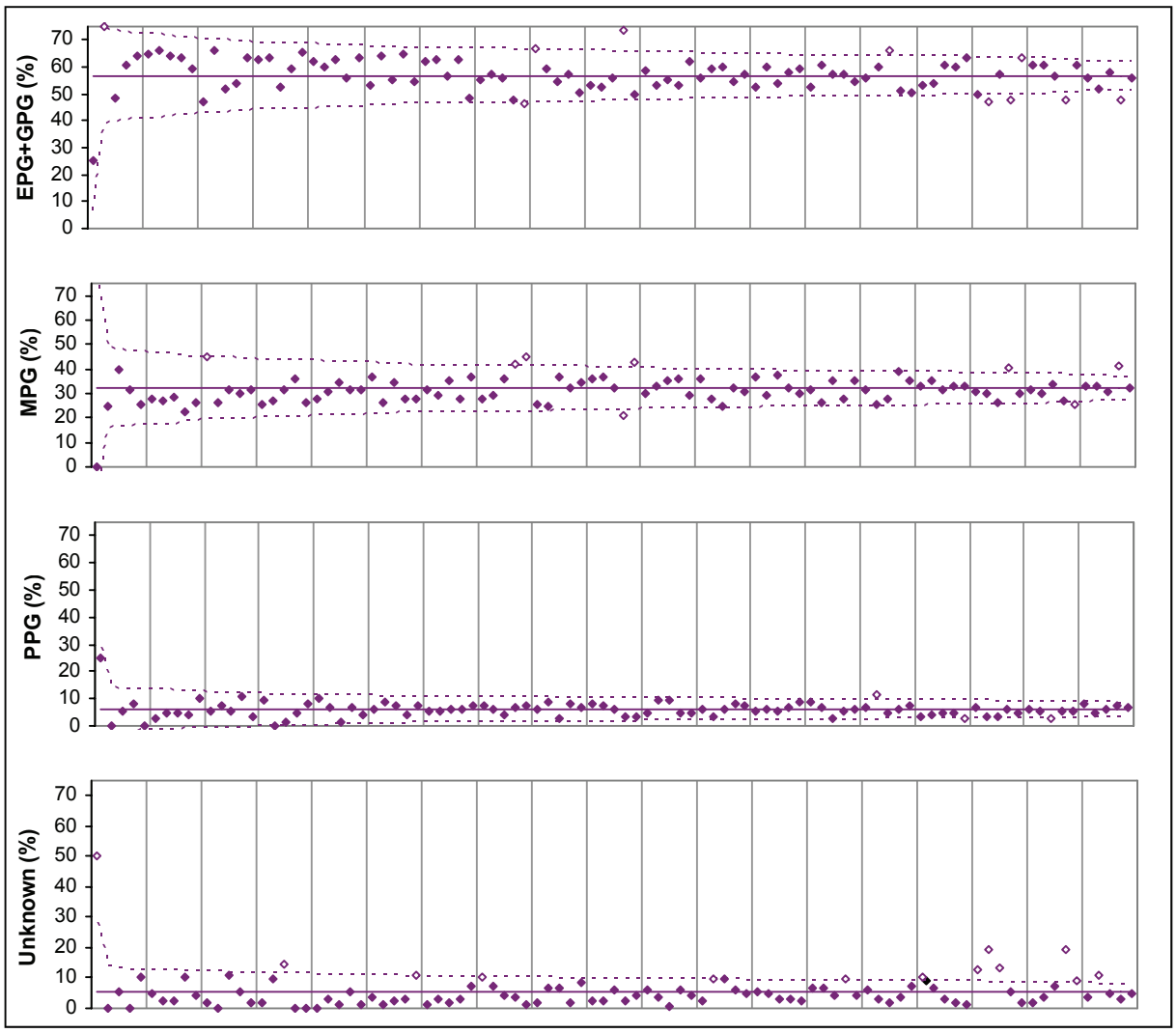

Figure 35: NPI Groups for invasive cancers in each screening unit
(open diamond shapes represent units which lie outside the control limits)

COMMENT:

- Overall, 29% of invasive cancers were Grade I, 50% were Grade II and 20% were Grade III. Grade was not assessable for 87 cases (1%) and unknown for 91 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.
- As expected with cancers detected by screening, the majority (60%) of cancers fell into the two best prognostic groups; the EPG (Excellent Prognostic Group) and GPG (Good Prognostic Group).
- The proportion of EPG and GPG cancers varied from 54% in Scotland to 62% in East Midlands, South West and Northern Ireland. The relatively low proportion of EPG and GPG cancers in Scotland is due to the high proportion of Grade III cancers compared with the UK as a whole.
- 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.

CHAPTER 6
SCREENING SURGICAL CASELOAD

There were 511 consultant breast surgeons working in the UK NHSBSP in 2005/06. This UK figure counts only once the 46 surgeons who worked in more than one region. Throughout this section, each surgeon is credited with their total UK screening caseload. 463 of the 511 consultant surgeons were identified by their unique GMC registration code. A code other than the GMC code was provided for a further 46 surgeons from Scotland. Data for the remaining 2 surgeons have been assumed to be for 2 individual surgeons.

6 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*

*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 93% in 2005/06.

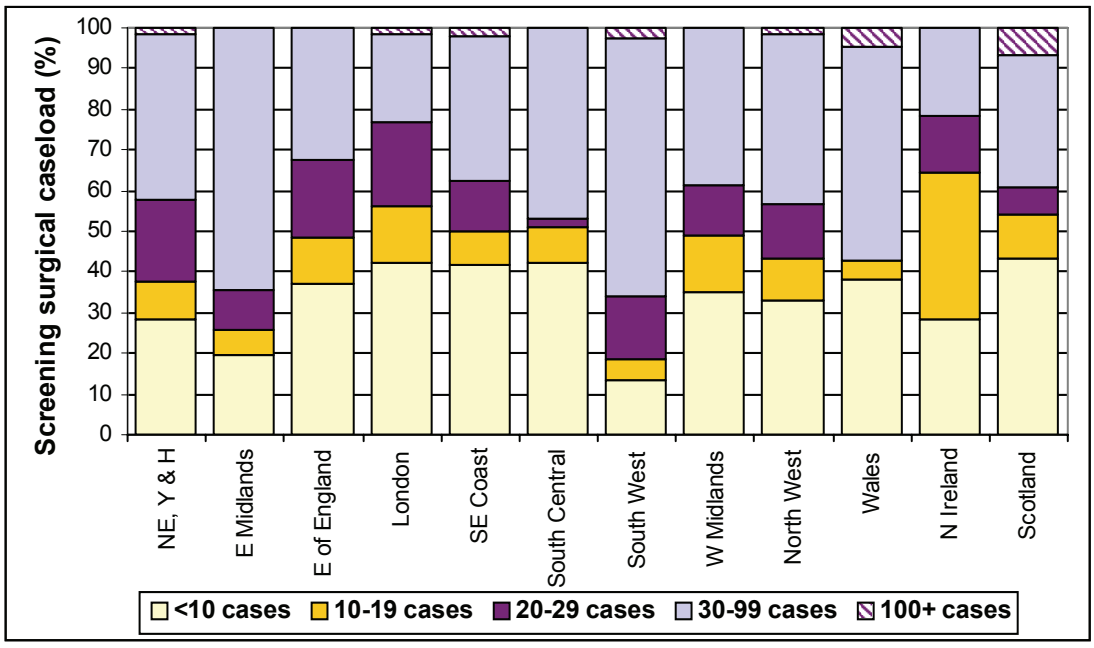

Figure 36 (Table 64): Variation in screening surgical caseload expressed as number of cases per surgeon

The screening surgical caseload is shown for each region in Figure 36. The 46 surgeons working in more than one region appear in each region's figures. 219 surgeons (43%) treated 30-99 cases and 10

surgeons (2%) treated more than 100 cases. 76 surgeons (15%) treated 20-29 screening cases, 57 (11%) treated 10-19 screening cases, and 149 surgeons (29%) had a screening caseload of fewer than 10 cases. The highest proportions of surgeons with a screening caseload of fewer than 10 were 43% in Scotland and 42% in London, South East Coast and South Central. Surgical specialisation was most advanced in South West where only 13% of surgeons (5 in total) treated fewer than 10 screening cases. Table 65 shows that the highest median surgical caseload was in East Midlands (53 cases) and the lowest in Northern Ireland (13.5 cases). The highest caseload for a single surgeon was in Scotland, where one surgeon was clinically responsible for 165 cases.

Table 66 shows the number of women treated by 1, 2, 3 or more surgeons and those with no referral to a consultant surgeon. Of the 15,944 screen detected cases included in the audit, the majority (98%) were treated by 1 consultant surgeon, 224 (1%) were treated by 2 surgeons and 91 had no consultant surgeon recorded. Six women were treated by 3 consultant surgeons.

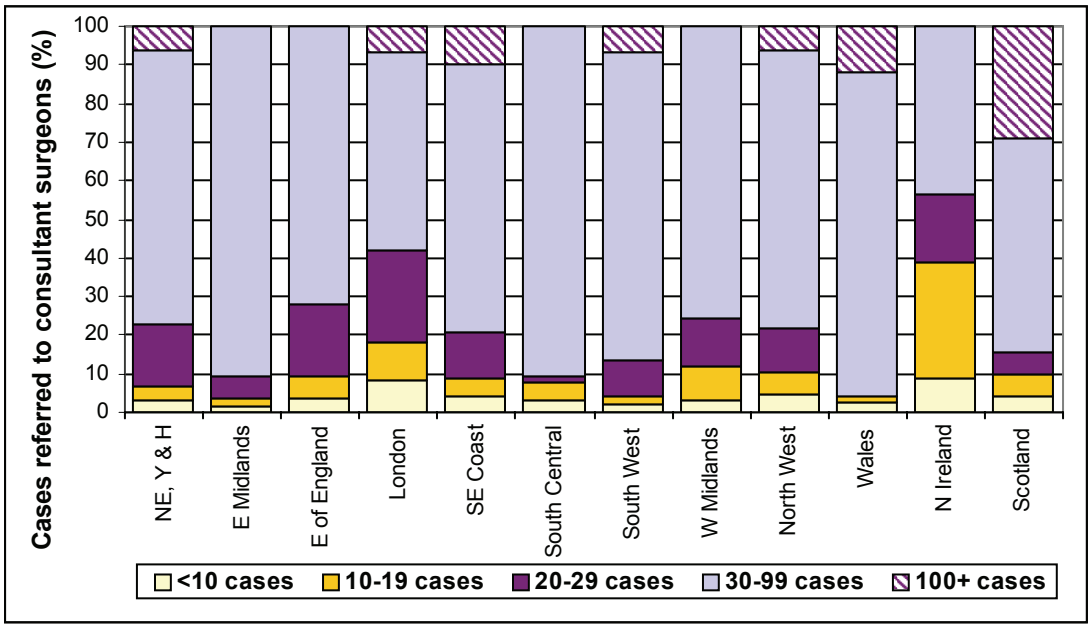

Figure 37 (Table 67): Variation in the proportion of women treated by surgeons with differing screening caseloads

Figure 37 shows the variation in the proportion of women treated by surgeons with differing screening caseloads. Of the 15,853 women who were under the care of a consultant surgeon, 11,716 (73%) were treated by a surgeon with a screening caseload of 30-99 cases. A further 1,176 women (7%) were treated by the 10 surgeons with screening caseload of 100 cases or more. For 1,889 women (12%) the treating surgeon had a screening caseload of 20-29 cases, and for 828 women (5%) the treating surgeon had a screening caseload of 10-19 cases. In the UK as a whole, 480 women (3%) were treated by a surgeon with screening caseload of less than 10 cases. 122 (25%) of these women were in London.

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

Of the 149 surgeons in the UK with a screening caseload of less than 10 cases, 69 (46%) treated more than 30 symptomatic breast cancers during 2005/06. 25 (17%) either joined or left the NHSBSP during 2005/06. 9 (6%) of the low caseload surgeons operated under patient choice. One of the other satisfactory reasons (plastic surgeon, private practice, not screening in area in 2005/06) was given for 33 surgeons (22%). For 2 surgeons a reason other than one of the 7 listed was provided. They treated a total of 11 women and the reasons provided were; screening unit suspended and covering for annual

leave. No information was available to explain the low screening caseload recorded for 11 surgeons (7%), treating a total of 23 women. 9 of these surgeons were in London. QA Reference Centre and QA surgeons should audit the cases treated by these low caseload surgeons to ascertain the reasons.

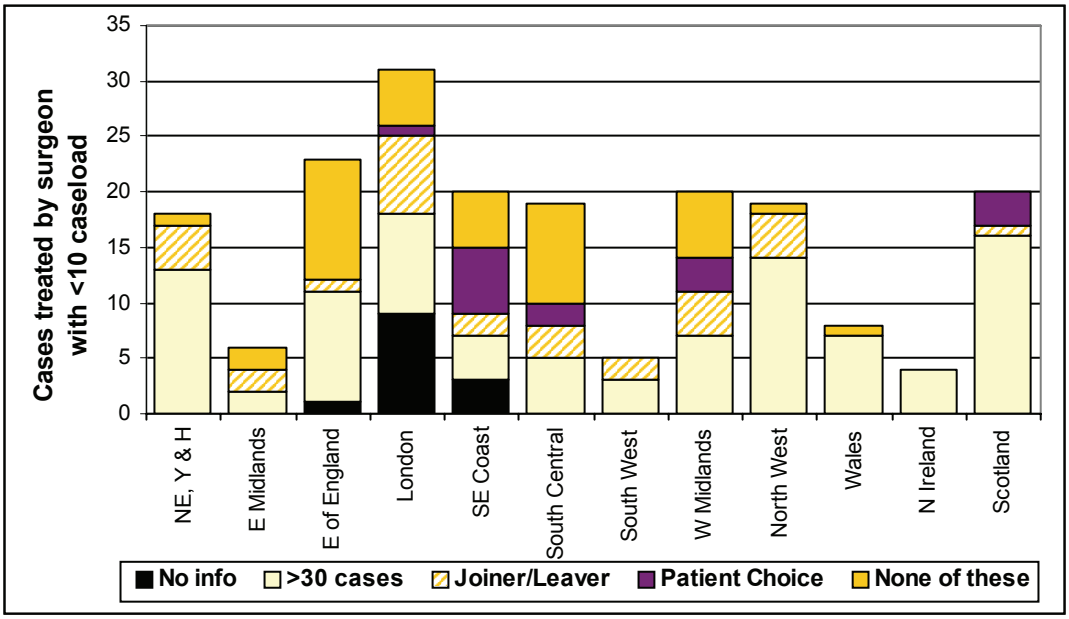

Figure 38 (Table 68): Explanations provided for surgeons treating less than 10 screening cases a year

COMMENT:

- There were 511 consultant breast surgeons working in the UK NHSBSP in 2005/06, a rise of 22% from the 419 surgeons in 2000/01.
- 93% of women were treated by a surgeon with a screening caseload of at least 20 cases.
- Of the 149 surgeons with screening caseload of less than 10 cases, 46% treated more than 30 symptomatic breast cancers during 2005/06.
- Information was unavailable to explain the low caseload of 11 surgeons treating a total of 23 women. 9 of these surgeons were in London.

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 in detail. 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 cancers are presented, together with detailed flow charts of the sequence of operations. Each flow chart represents the number of different sequences in the UK as a whole. Regional variations in the most popular sequences are summarised in Tables 73, 75, 77 and 79 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)

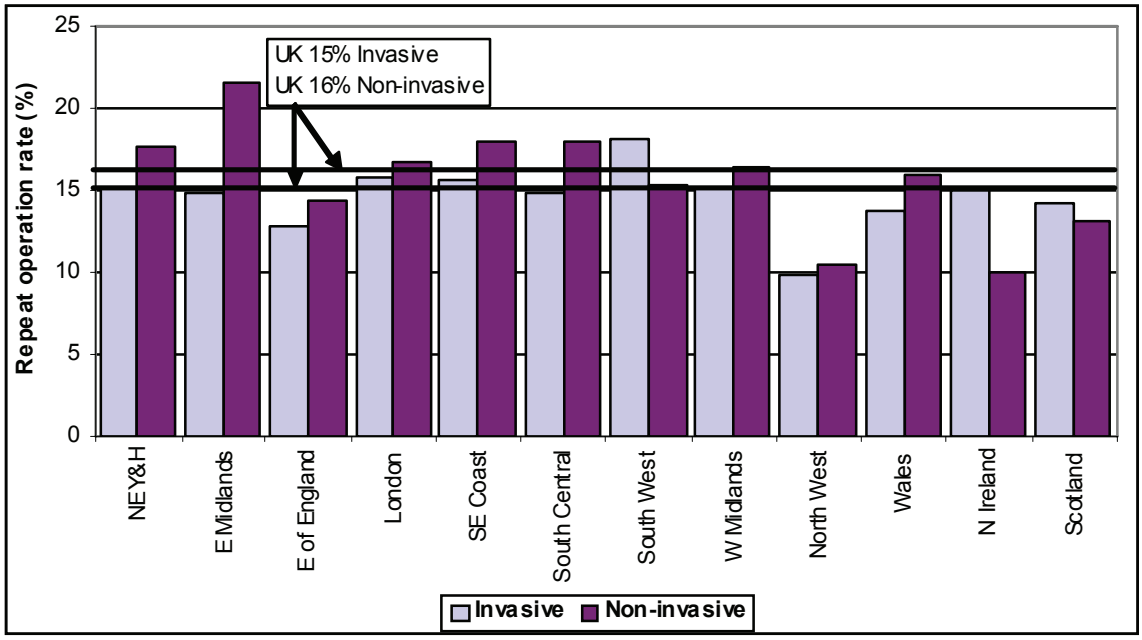

Figure 39 (Tables 70 & 71): Variation in the proportion of invasive and non-invasive cancers undergoing two or more therapeutic operations

It is not possible to identify from the information held on NBSS 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. In the UK as a whole, 2,308 cancers (15%) with a proven non-operative diagnosis by C5 cytology and/or B5 core biopsy underwent more than one therapeutic operation (Table 69). This varied from 11% in North West to 18% in South West. 1,827 invasive cancers (15%) and 502 non-invasive cancers (16%) underwent more than one therapeutic operation (Tables 70 and 71). For invasive cancers the proportion having more than one operation varied from 10% in North West (130 cancers) to 18% in South West (223 cancers). For non-invasive cancers the proportion having more than one operation varied from 10% in North West (32 cancers) and Northern Ireland (4 cancers) to 21% in East Midlands (51 cancers).

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 : Multi-focal invasive cancer present

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

Scenario 4 : Margins not clear for unexpected DCIS present with a small invasive tumour

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

Scenario 5 : 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

Sections 7.2, 7.3, 7.4 and 7.5 examine the sequence, number and nature of the therapeutic operations carried out on cancers with different non-operative diagnoses. A summary of the repeat operation rates for each type of non-operative diagnosis is provided at the end of Section 7.5.

7.2 Sequence of Operations for Cancers with B5b (Invasive) Core Biopsy Proved to be Invasive After Surgery

99% of cancers with a B5b (Invasive) core biopsy result proved to be invasive following surgery (Table 9). The treatment operation can thus be planned in advance and these cases are least likely to require a repeat therapeutic operation. In the UK as a whole, 13% of invasive cancers with a B5b (Invasive) core biopsy required a repeat therapeutic operation. This varied from 8% in North West (88 cancers) to 21% in Northern Ireland (20 cancers) (Table 72).

The flow chart in Figure 40 shows that 84% of B5b (Invasive) cancers with known surgical treatment underwent a single therapeutic operation consisting of either conservation surgery with an axillary procedure (64%, 6,749 cases) or a mastectomy with an axillary procedure (20%, 2,168 cases). A further 171 cases (2%) had a single operation (conservation surgery (116 cases) or mastectomy (55 cases)) where no axillary procedure was recorded. 43 of these cases (25%) were in London. 6 cases were recorded as having had a single operation involving only an axillary procedure. For 511 cases (5%) an initial operation involving conservation surgery with an axillary procedure was followed by one repeat conservative operation, presumably to clear involved or close margins for either the original invasive cancer or associated DCIS. 75 of these cases were in North East, Yorkshire & Humber and 74 in East Midlands. A further 19 cases had additional conservation surgery alone in a third or fourth operation, presumably for the same reason.

After initial conservation surgery and axillary surgery, 118 cancers (1%) had additional axillary surgery alone, 109 cancers (1%) had repeat conservation surgery and additional axillary surgery, 127 cases (1%) had a mastectomy and an axillary procedure. A further 33 cancers had additional axillary surgery alone after an initial mastectomy and axillary surgery. Thus, in the UK as a whole, 4% of B5b (Invasive) cancers underwent repeat operations involving additional axillary procedures which were presumably undertaken to clear the axilla when initial axillary sampling or a sentinel lymph node biopsy indicated the presence of positive nodes. In South West additional axillary procedures were performed on 7% of these cancers.

After initial conservation surgery and axillary surgery, 389 cancers (4%) went on to have a mastectomy in a repeat operation. A further 32 cancers had a mastectomy in a repeat operation after initial conservation surgery alone. Thus, in the UK as a whole, 4% of B5b (Invasive) cancers had repeat operations which converted initial conservative operations to a mastectomy presumably either because extensive DCIS was present at the margins or because multi-focal invasive disease was present. In Northern Ireland 10% of B5b (Invasive) cancers initially treated with conservation surgery eventually had a mastectomy.

171 cases had a single operation (conservation surgery or mastectomy) where no axillary procedure was recorded. 94 of the cases treated with conservation surgery alone in their first operation had axillary surgery in a second, third or fourth operation and 5 cases treated with mastectomy alone in their first operation had axillary surgery in a repeat operation. This varied from 0% in East Midlands, South Central and North East, Yorkshire & Humber to 3% in Scotland. It is not clear why these B5b (Invasive) cancers did not have axillary surgery at their first operation. QA reference centres and QA surgeons should audit these cases to determine whether this is a data collection issue or a true reflection of clinical practice.

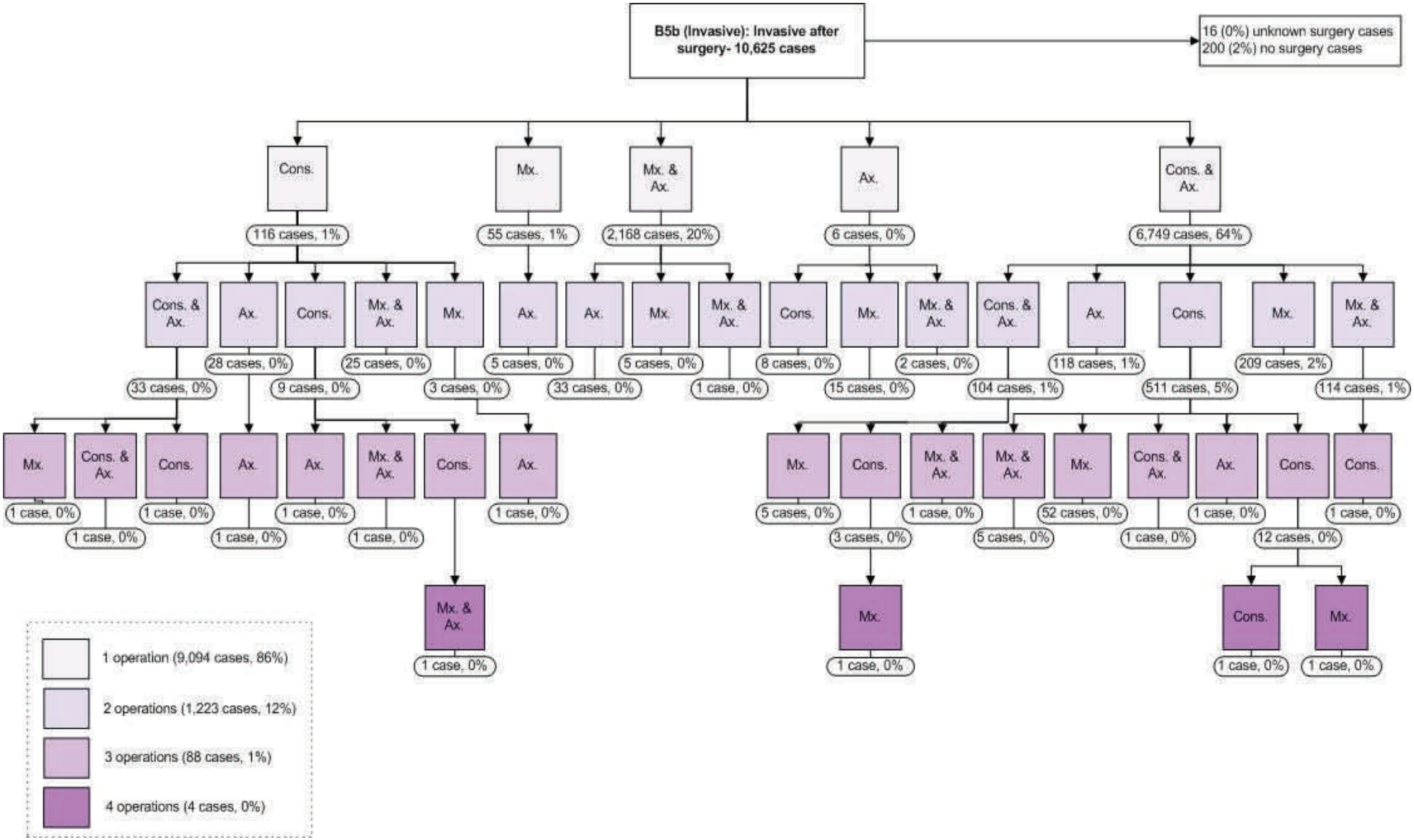

Figure 40: Sequence of operations for cancers with B5b (Invasive) core biopsy proved to be invasive after surgery

7.3 Sequence of Operations for Invasive Cancers with a C5 Cytology Only Non-operative Diagnosis

For invasive cancers with C5 cytology only and no B5 core biopsy prior to surgery where the invasive status cannot be predicted microscopically, radiological or clinical features are of increased importance when planning the treatment operation. Figure 41 shows that 83% of these cancers underwent a single therapeutic operation consisting of conservation surgery and an axillary procedure (69%, 576 cancers) or a mastectomy and an axillary procedure (14%, 115 cancers). 40 (35%) of the latter cancers were in North East Yorkshire & Humber, and 23 (20%) were in North West. Presumably for these 115 cancers, the clinical and radiological signs were strongly supportive of the presence of invasive disease. Nevertheless, regional QA reference centres and regional QA surgeons should audit these cancers to ascertain the reasons for going straight to a mastectomy after C5 cytology.

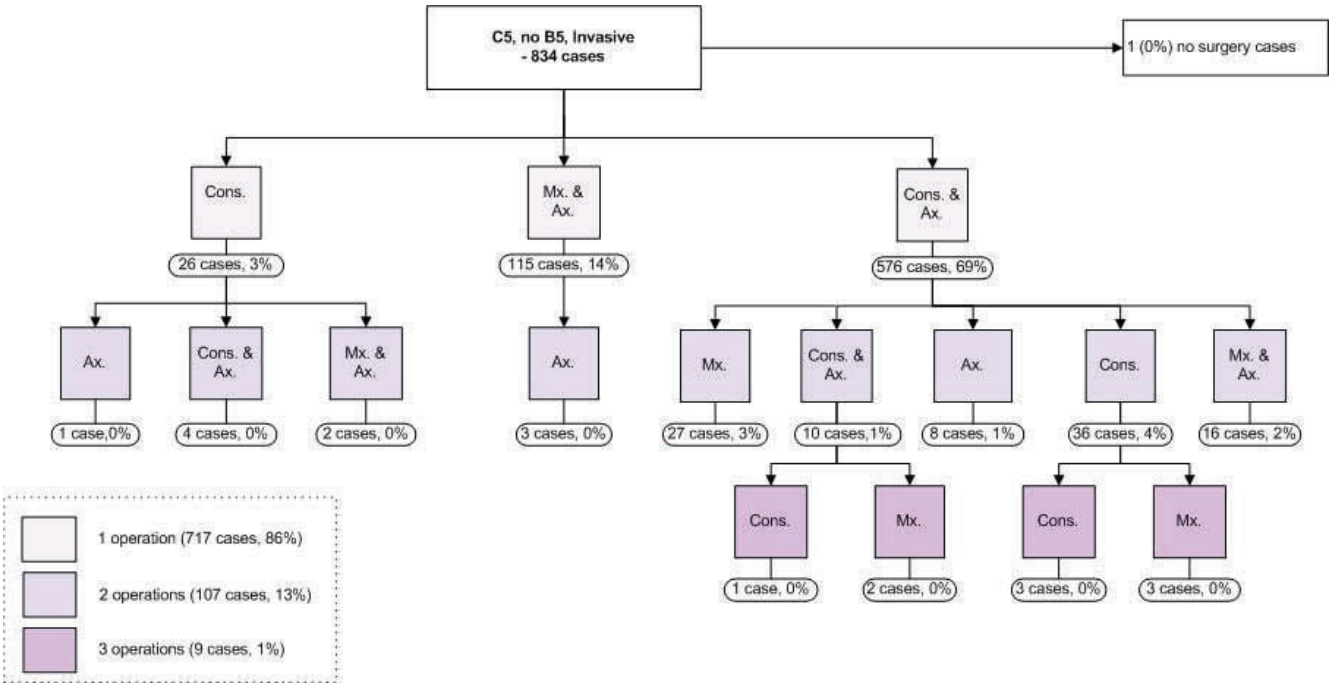

Figure 41: Sequence of operations for invasive cancers with C5 cytology only, no B5 core biopsy

In the UK as a whole, 116 (14%) of the 833 surgically treated invasive cancers diagnosed by C5 cytology only underwent a repeat operation (Table 74). 27 (23%) of these cancers were in North East Yorkshire & Humber, 26 (23%) were in South East Coast and 23 (20%) were in North West. After initial conservation surgery and axillary surgery, 8 cancers had additional axillary surgery alone, 10 cancers had repeat conservation surgery and additional axillary surgery, 16 cancers had a mastectomy with an axillary procedure. After an initial mastectomy and axillary surgery, 3 cancers had additional axillary surgery alone. In these repeat operations, the axillary procedures were again presumably undertaken to clear the axilla when initial axillary sampling or a sentinel lymph node biopsy indicated the presence of positive nodes.

40 cancers had additional conservation surgery and 32 cancers a mastectomy in a second or third operation. The repeat conservative operations and final mastectomies were presumably performed either because extensive DCIS was present at the margins or because multi-focal invasive disease was present. 7 cases treated with conservation surgery alone in their first operation had axillary surgery in a second operation, presumably because local protocols did not recommend axillary procedures for cases diagnosed by C5 cytology only.

Figure 42: Sequence of operations for cancers with B5a (Non-invasive) core biopsy proved to be non-invasive or micro-invasive after surgery

7.4 Sequence of Operations for Cancers with B5a (Non-invasive) Core Biopsy Proved to be Non-invasive or Micro-invasive After Surgery

The accuracy of a B5a (Non-invasive) core biopsy result together with radiological and clinical factors determines the planned treatment options. In the UK as a whole, 78% of cancers with a B5a (Non-invasive) core biopsy result were confirmed to be non-invasive or micro-invasive following surgery (Table 8). Figure 42 show that 80% of these cancers had a single operation to the breast. 1,260 (49%) cancers had only conservation surgery, 144 (6%) had a mastectomy, 97 (4%) had a conservation surgery with axillary surgery and 534 (21%) had a mastectomy with an axillary procedure. The proportion of B5a (Non-invasive) cancers having an initial operation involving the axilla varied from 16% in South West to 38% in North West.

It is good practice to sample nodes for non-invasive and micro-invasive cancers treated with mastectomy to reduce the chances of having to perform a second operation if unexpected invasive disease is found in the mastectomy specimen. Operating on the axilla when performing conservative surgery to the breast for non-invasive or micro-invasive cancers is also acceptable and may well become more common practice as sentinel node biopsy is rolled out across the UK. However, regional QA reference centres and regional QA surgeons should audit all non-invasive cancers with known nodal status not determined on the basis of a sentinel lymph node procedure to ascertain the number of nodes examined, as clearance of the axilla for a non-invasive cancer could be viewed as an unnecessary procedure which may lead to treatment-related side effects.

Overall, 475 (19%) of the 2,518 surgically treated cancers with B5a (Non-invasive) core biopsy result that were confirmed to be non-invasive or micro-invasive following surgery had a repeat therapeutic operation (Table 76). The repeat operation rate varied from 9% in Northern Ireland (3 cancers) to 23% in South Central (39 cancers) and East Midlands (47 cancers).

In the UK as a whole, 277 (11%) of B5a (Non-invasive) cancers initially treated with conservation surgery had a second or third conservative operation, presumably to clear DCIS which was still present at the tumour margins. This varied between 6% in Northern Ireland and 15% in South East Coast and East Midlands. 166 B5a (Non-invasive) cancers initially treated with conservation surgery alone and 15 initially treated with conservation and an axillary procedure were converted to mastectomies after one or more further operations. For 93 of these cases, an axillary procedure was performed at the same time as the mastectomy and for 13 cases an axillary procedure was performed at the same time as the conservation surgery. In the UK as a whole, 181 (7%) of B5a (Non-invasive) cancers had repeat operations which converted initial conservative operations to a mastectomy presumably either because extensive DCIS was present at the margins or because multi-focal invasive disease was present. In Northern Ireland, only 3% of B5a (Non-invasive) cancers initially treated with conservation eventually had a mastectomy.

7.5 Sequence of Operations for Cancers with B5a (Non-invasive) Core Biopsy Determined to be Invasive After Surgery

In the UK as a whole, 22% of cancers with a B5a (Non-invasive) core biopsy result were identified to have invasive disease following surgery (Table 8). There was, however, wide variation between individual screening units in the number of such cases. Furthermore, in units which had 15 or more cancers diagnosed as B5a (Non-invasive) at core biopsy, the proportion found to be invasive after surgery varied from 0% to 56%. There are also differences in the policies followed by screening units regarding exploration of the axilla for cancers with a non-invasive or micro-invasive non-operative

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

diagnosis. All of these factors lead to major differences across the UK in the proportion and number of repeat surgical operations undertaken on cancers diagnosed on core biopsy as non-invasive but later found to be invasive. The operations received by these tumours are summarised in Figure 43 for the UK as a whole and in Table 78 for individual regions.

Figure 43 shows that only 51% (361 cases) of B5a (Non-invasive) cancers found to be invasive after surgery underwent a single therapeutic operation. 51 of these cases had only conservative surgery and 10 had only a mastectomy. 300 cases had either conservative surgery (99 cases) or a mastectomy (201 cases) with an axillary procedure. The proportion of invasive B5a (Non-invasive) cancers which had surgery to the axilla at the first operation varied from 34% in West Midlands to 66% in South West (Table 79). Presumably in these cases, contrary to the core biopsy result, the clinical and radiological signs were strongly supportive of the presence of an invasive cancer.

351 (49%) of the 712 cancers with a B5a (Non-invasive) core biopsy determined to be invasive after surgery underwent a repeat operation (Table 78). This varied from 32% in East of England to 59% in North West. In the UK as a whole, 108 cancers (15%) cancers initially treated with conservation surgery alone (82 cancers) or with conservation surgery and axillary surgery (26 cancers) were converted to mastectomies after one or more further operations. This varied between 7% in East Midlands and 28% in North West. 118 (17%) invasive B5a (Non-invasive) cancers had repeat conservative operations presumably carried out because of the presence of extensive or multi-focal DCIS. In South West, 31% of these cancers had repeat conservation surgery.

After initial conservation surgery or a mastectomy alone, 281 cancers (39% of the original cohort) went on to have axillary surgery either alone (114 cancers) or in combination with additional conservation surgery (91 cancers) or a mastectomy (76 cancers). 22 cancers initially treated with conservation surgery and axillary surgery and 7 cancers initially treated with mastectomy and axillary surgery had repeat operations to the axilla.

The table below summarises the regional variation in repeat operation rates for the types of cancer discussed in Sections 7.2 to 7.5. The data show that invasive cancers with B5b (Invasive) core biopsy had fewest repeat operations (13%). Invasive cancers diagnosed on the basis of C5 cytology alone had a similar repeat operation rate of 14%. As expected, invasive cancers with a B5a (Non-invasive) core biopsy had the highest repeat operation rate (49%). Non-invasive or micro-invasive cancers with a B5a (Non-invasive) core biopsy had a repeat operation rate of 19%.

REPEAT THERAPEUTIC OPERATION RATES

	Invasive cancers						***Non-invasive or micro-invasive cancers***	
	B5b *(Table 72)*		***C5 only, no B5*** *(Table 74)*		***B5a*** *(Table 78)*		***B5a*** *(Table 76)*	
Region	***No.***	***%***	***No.***	***%***	***No.***	***%***	***No.***	***%***
N East, Yorks & Humber	*161*	*13*	*27*	*16*	*55*	*56*	*72*	*21*
East Midlands	*122*	*13*	*0*	*0*	*25*	*44*	*47*	*23*
East of England	*130*	*13*	*1*	*3*	*14*	*32*	*40*	*19*
London	*134*	*14*	*9*	*17*	*32*	*42*	*50*	*21*
South East Coast	*86*	*11*	*26*	*20*	*46*	*58*	*45*	*21*
South Central	*106*	*13*	*4*	*9*	*28*	*55*	*39*	*23*
South West	*159*	*15*	*11*	*22*	*45*	*48*	*50*	*18*
West Midlands	*124*	*13*	*9*	*13*	*37*	*57*	*36*	*18*
North West	*88*	*8*	*23*	*12*	*19*	*59*	*33*	*13*
Wales	*68*	*12*	*0*	*0*	*17*	*36*	*25*	*17*
Northern Ireland	*20*	*21*	*4*	*5*	*4*	*40*	*3*	*9*
Scotland	*117*	*12*	*2*	*29*	*29*	*51*	*35*	*16*
United Kingdom	***1315***	***13***	***116***	***14***	***351***	***49***	***475***	***19***

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

7.6 The Effect of Extensive DCIS on Repeat Operation Rates for Invasive Cancers

The quality assurance outcome measure relating to repeat therapeutic operations refers strictly only to women with single focus lesions without extensive associated DCIS. By comparing repeat operation rates for less than 20mm invasive cancers with and without the presence of extensive DCIS, Figure 44 illustrates the extent to which associated DCIS can contribute to repeat operation rates for invasive cancers. Thus, while the overall repeat operation in the UK for tumours with invasive size less than 20mm and whole size 30mm or more is 34%, the repeat operation rate for tumours with whole size and invasive size less than 20mm is only 11%.

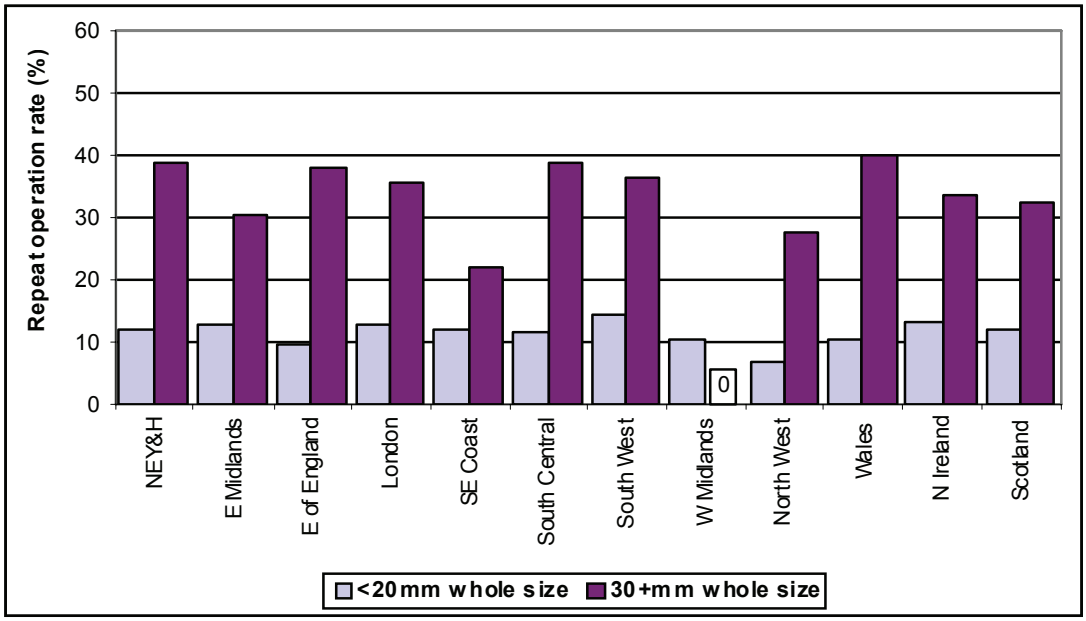

Figure 44 (Table 80): Variation in the repeat operation rates for <20mm invasive cancers with whole size <20mm and 30+mm

7.7 The Effect of a B5a (Non-invasive) Non-operative Diagnosis on Repeat Operation Rates for Invasive Cancers

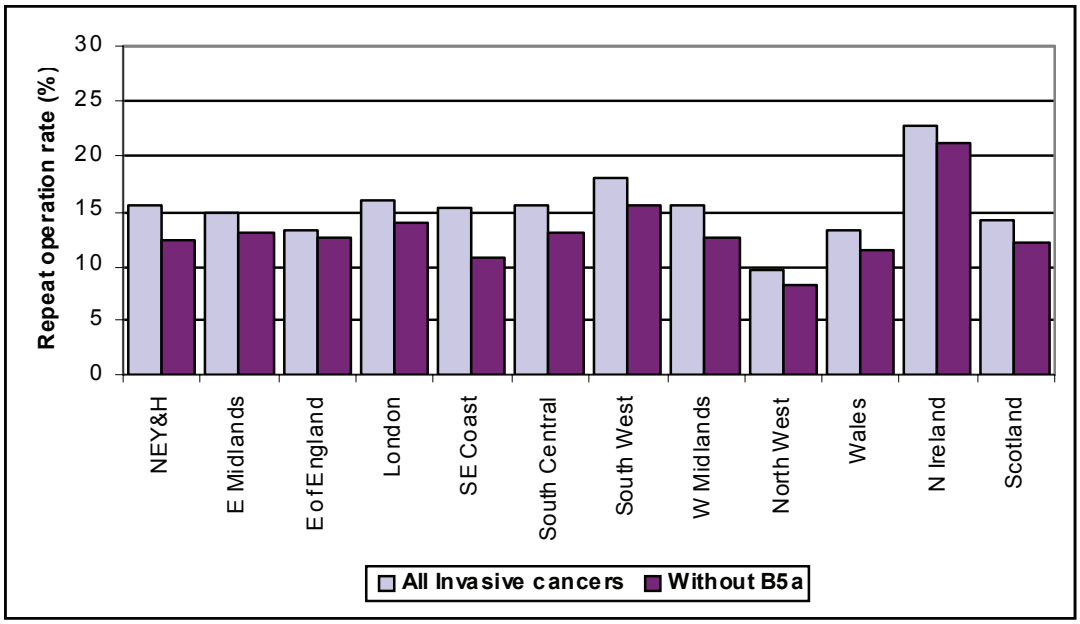

Figure 45 (Table 81): Variation in the repeat operation rates for invasive cancers including and excluding invasive cancers with a B5a (Non-invasive) non-operative diagnosis

Figure 45 illustrates the extent to which having a B5a (Non-invasive) non-operative diagnosis can contribute to repeat operation rates for invasive cancers by comparing repeat operation rates for invasive cancers including and excluding invasive cancers with a B5a (Non-invasive) non-operative diagnosis. Thus, while the overall repeat operation rate in the UK for all invasive cancers is 15%, when invasive cancers with a B5a (Non-invasive) non-operative diagnosis are excluded, this falls to 12%.

7.8 The Effect of Non-operative Diagnostic Predictions on 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 proportion of invasive cancers with axillary surgery undertaken in each region at first and repeat operations varies with the non-operative diagnostic result. In the UK as a whole, axillary surgery was performed for 98% of invasive cancers with a B5b (Invasive) core biopsy. For 97% of these cancers, the axillary surgery was carried out at the first operation and only 1% (99 cancers) had their axillary surgery at the repeat operation. 183 cancers (2%) had no axillary procedure recorded (Table 73). 49 (27%) of these cancers were in London, 28 (15%) in South East Coast, 26 (14%) in North West and 25 (14%) were 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.

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

	B5b (Table 73)			C5 (Table 75)			B5a (Table 79)		
Region	**Total**	**1st Op**	**Repeat Op**	**Total**	**1st Op**	**Repeat Op**	**Total**	**1st Op**	**Repeat Op**
N East, Yorks & Humber	99	99	0	100	100	0	98	49	48
East Midlands	99	99	0	100	100	0	93	54	39
East of England	97	97	1	80	80	0	84	57	27
London	93	91	2	98	96	2	79	53	26
South East Coast	96	96	1	92	91	2	89	43	46
South Central	99	98	0	98	93	4	92	43	49
South West	98	97	1	100	100	0	92	66	27
West Midlands	100	99	1	100	100	0	86	34	52
North West	98	96	1	97	97	0	94	41	53
Wales	100	99	1	100	100	0	94	64	30
Northern Ireland	100	100	0	97	97	0	70	40	30
Scotland	99	96	3	100	71	29	96	51	46
United Kingdom	**98**	**97**	**1**	**97**	**96**	**1**	**90**	**51**	**40**

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

A similar picture was apparent for invasive cancers diagnosed by C5 cytology only, with 97% having axillary surgery. For 96% of these cancers, the axillary surgery was carried out at the first operation. In Scotland, axillary surgery was performed for only 71% of cancers at the first operation. However, the proportion of these cancers with axillary surgery was increased to 100% via repeat operations. 26 cancers (3%) did not have any axillary procedure recorded (Table 75). 10 (38%) of these were in South East Coast and 6 in East of England, where only 80% of the C5 invasive cancers had axillary surgery recorded. Regional QA reference centres and regional QA surgeons should audit these cancers to ensure that the axilla has not been under-treated.

In the UK as a whole, 90% of invasive cancers with a B5a (Non-invasive) diagnosis had axillary surgery. This varied from 70% in Northern Ireland to 98% in North East Yorkshire & Humber. Overall, 51% of invasive cancers with a B5a (Non-invasive) diagnosis had their axillary surgery at

the first operation, with repeat operations providing nodal data for 40%.

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 South West (66%) and lowest in West Midlands (34%). In the UK as a whole, 68 (10%) B5a (Non-invasive) cancers found to be invasive after surgery did not have any axillary procedure recorded. 16 (24%) of these cancers were in London.

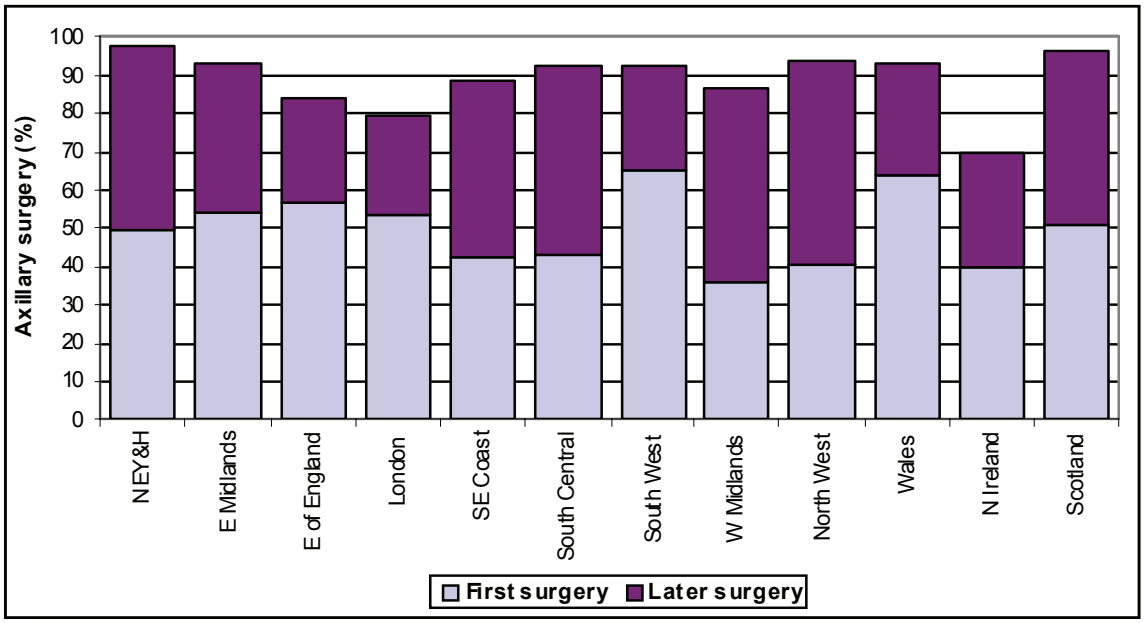

Figure 46 (Table 79) : Variation in proportion of invasive cancers with B5a (Non-invasive) non-operative diagnosis and axillary surgery at first and repeat operations

The summary table below shows the proportion of invasive cancers in each region with no axillary surgery recorded. Overall, 277 invasive cancers had no surgery to the axilla recorded. Only 2% of invasive cancers with a B5b (Invasive) core biopsy and 3% of invasive cancers with C5 cytology only had no axillary procedure recorded. In contrast, in the UK as a whole, 10% of invasive cancers with a B5a (Non-invasive) core biopsy (68 cancers) had no surgery to the axilla recorded. This varied from 2 cancers in North East Yorkshire & Humber (2%) to 16 cancers (21%) in London and 3 cancers (30%) in Northern Ireland.

INVASIVE CANCERS WITH NO AXILLARY OPERATION

	B5b *(Table 73)*		***C5 only, no B5*** *(Table 75)*		***B5a*** *(Table 79)*	
Region	***No.***	***%***	***No.***	***%***	***No.***	***%***
N East, Yorks & Humber	*11/1,285*	*1*	*0/173*	*0*	*2/99*	*2*
East Midlands	*6/913*	*1*	*0/3*	*0*	*4/57*	*7*
East of England	*25/1,031*	*2*	*6/30*	*20*	*7/44*	*16*
London	*49/936*	*5*	*1/53*	*2*	*16/77*	*21*
South East Coast	*28/772*	*4*	*10/133*	*8*	*9/80*	*11*
South Central	*11/805*	*1*	*1/45*	*2*	*4/51*	*8*
South West	*16/1,026*	*2*	*0/51*	*0*	*7/93*	*8*
West Midlands	*2/962*	*0*	*0/72*	*0*	*9/65*	*14*
North West	*26/1,063*	*2*	*6/190*	*3*	*2/32*	*6*
Wales	*1/570*	*0*	*0/1*	*0*	*3/47*	*6*
Northern Ireland	*0/94*	*0*	*2/75*	*3*	*3/10*	*30*
Scotland	*8/968*	*1*	*0/7*	*0*	*2/57*	*4*
United Kingdom	**183/10,425**	**2**	***26/833***	***3***	***68/712***	***10***

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

The following table 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 in 2006, 40% of the cases with insufficient nodal status recorded in the 2004/05 audit were actually recorded incorrectly. Regional QA reference centres and regional QA surgeons should therefore ensure that nodal information is properly recorded in order to prevent incorrect conclusions being drawn regarding the possible under-treatment of the axilla.

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

	2002/03		2003/04		2004/05	
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**
N East, Yorks & Humber	4	5	4	6	2	2
East Midlands	4	9	1	2	4	7
East of England	5	16	9	23	7	16
London	8	15	13	21	16	21
South East Coast	12	22	7	16	9	11
South Central	12	23	7	18	4	8
South West	3	6	7	11	7	8
West Midlands	3	6	4	7	9	14
North West	4	6	3	11	2	6
Wales	1	3	2	5	3	6
Northern Ireland	3	14	1	20	3	30
Scotland	4	10	2	4	2	4
UK	**63**	**11**	**60**	**11**	**68**	**10**

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

COMMENT:

- In the UK as a whole, 15% 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 11% in North West to 18% in South West.
- 15% of invasive cancers and 16% of non-invasive cancers had more than one therapeutic operation. The proportion of invasive cancers having a repeat operation varied from 10% in North West to 18% in South West. The proportion of non-invasive cancers having a repeat operation varied from 10% in Northern Ireland and North West to 21% in East Midlands.
- Invasive cancers with B5b (Invasive) core biopsy or on the basis of C5 cytology alone had fewest repeat operations (13% and 14% respectively). Invasive cancers with a B5a (Non-invasive) core biopsy had a 49% repeat operation rate. Non-invasive or micro-invasive cancers with a B5a (Non-invasive) core biopsy had a repeat operation rate of 19%.
- 84% of invasive cancers with a B5b (invasive) core biopsy underwent a single therapeutic operation consisting of conservation surgery or a mastectomy with an axillary procedure. For 5% of cancers, conservation surgery with an axillary procedure was followed by one repeat conservative operation, presumably to clear involved or close margins for either the original invasive cancer or associated DCIS.
- 4% of B5b (Invasive) cancers underwent repeat operations involving additional axillary procedures which were presumably undertaken to clear the axilla when initial axillary sampling or a sentinel lymph node biopsy indicated the presence of positive nodes. In South West, additional axillary procedures were performed on 70% of these cancers.
- 4% of B5b (Invasive) cancers had repeat operations which converted initial conservative operations to a mastectomy presumably either because extensive DCIS was present at the margins or because multi-focal invasive disease was present. In Northern Ireland, 10% of B5b (Invasive) cancers initially treated with conservation surgery eventually had a mastectomy.
- 72 B5b (Invasive) cancers had no axillary procedure recorded a first or subsequent operation. QA reference centres and QA surgeons should audit these cases to determine whether this is a data

COMMENT:

collection issue or a true reflection of clinical practice.

- 69% of invasive cancers diagnosed by C5 cytology only underwent a single therapeutic operation consisting of conservation surgery with an axillary procedure. A further 14% of these cancers underwent a single therapeutic operation consisting of a mastectomy and an axillary procedure. Presumably in these cases, the clinical and radiological signs were strongly supportive of the presence of invasive disease. Nevertheless, regional QA reference centres and regional QA surgeons should audit these cancers to ascertain the reasons for going straight to a mastectomy after C5 cytology.
- 80% of B5a (Non-invasive) cancers which were proven to be non-invasive or micro-invasive after surgery had a single operation to the breast. 49% had only conservation surgery, 6% had a mastectomy alone, 4% had a conservation surgery with axillary surgery and 534 (21%) had a mastectomy with an axillary procedure. The proportion of B5a (Non-invasive) cancers having an initial operation involving the axilla varied from 16% in South West to 38% in North West.
- 11% of non-invasive and micro-invasive cancers with a B5a (Non-invasive) diagnosis initially treated with conservation surgery had a second or third conservative operation, presumably to clear DCIS which was still present at the tumour margins. This varied between 6% in Northern Ireland and 15% in South East Coast and East Midlands.
- 7% of non-invasive and micro-invasive cancers with a B5a (Non-invasive) diagnosis had repeat operations which converted initial conservative operations to a mastectomy presumably either because extensive DCIS was present at the margins or because multi-focal invasive disease was present. In Northern Ireland only 3% of these cases eventually had a mastectomy.
- 14% of invasive cancers with a B5a (Non-invasive) core biopsy underwent a single operation consisting of conservation surgery with an axillary procedure and 28% had a mastectomy with an axillary procedure. The proportion of invasive B5a (Non-invasive) cancers which had surgery to the axilla at the first operation varied from 34% in West Midlands to 66% in South West. Presumably in these cases, contrary to the core biopsy result, the clinical and radiological signs were strongly supportive of the presence of an invasive cancer.
- 15% of invasive B5a (Non-invasive) cancers initially treated with conservation surgery alone or initially treated with conservation surgery and axillary surgery were converted to mastectomies after one or more further operations. This varied between 7% in East Midlands and 28% in North West.
- 17% of invasive B5a (Non-invasive) cancers had repeat conservative operations presumably carried out because of the presence of extensive or multi-focal DCIS. In South West, 31% of these cancers had repeat conservation surgery.
- While the overall repeat operation for tumours with invasive size less than 20mm and whole size 30mm or more is 34%, the repeat operation rate for tumours with whole size and invasive size less than 20mm is only 11%. This illustrates the extent to which associated DCIS can contribute to repeat operation rates for invasive cancers.
- The overall repeat operation rate for all invasive cancers is 15%. When invasive cancers with a B5a (Non-invasive) non-operative diagnosis are excluded, this falls to 12%.
- In the UK as a whole, axillary surgery was performed for 98% of invasive cancers with a B5b (Invasive) core biopsy. For 97% 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 operation, with 1% having their axillary surgery at a repeat operation.
- 90% of invasive cancers with a B5a (Non-invasive) diagnosis had axillary surgery. 51% of these cancers had their axillary surgery at the first operation, with repeat operations providing nodal data for the additional 40%.
- 183 invasive cancers with a B5b (Invasive) core biopsy, 26 invasive cancers with C5 cytology and 68 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 2004 and 31 March 2005, 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 2006, allowing a minimum of 12 months follow up for each case.

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 2004/05 ABS at BASO audit reported tumour characteristics and primary treatment data for 13,783 screen detected breast cancers. 30 extra cases were later found to be missing in last year's main audit. 24 (80%) of these are from North East Yorkshire & Humber. Thus, 13,813 cases were eligible for inclusion in the adjuvant therapy audit. Of these, 1,250 (9%) had no adjuvant data supplied. 773 cases (6%) were excluded from the audit due to incomplete surgery data or because the woman had had a previous cancer. Following these exclusions, 11,790 cases (85%) 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 (96%). Scotland (66%) had the lowest proportion of eligible cases because no adjuvant data were supplied for 34% of their cancers (Table 82).

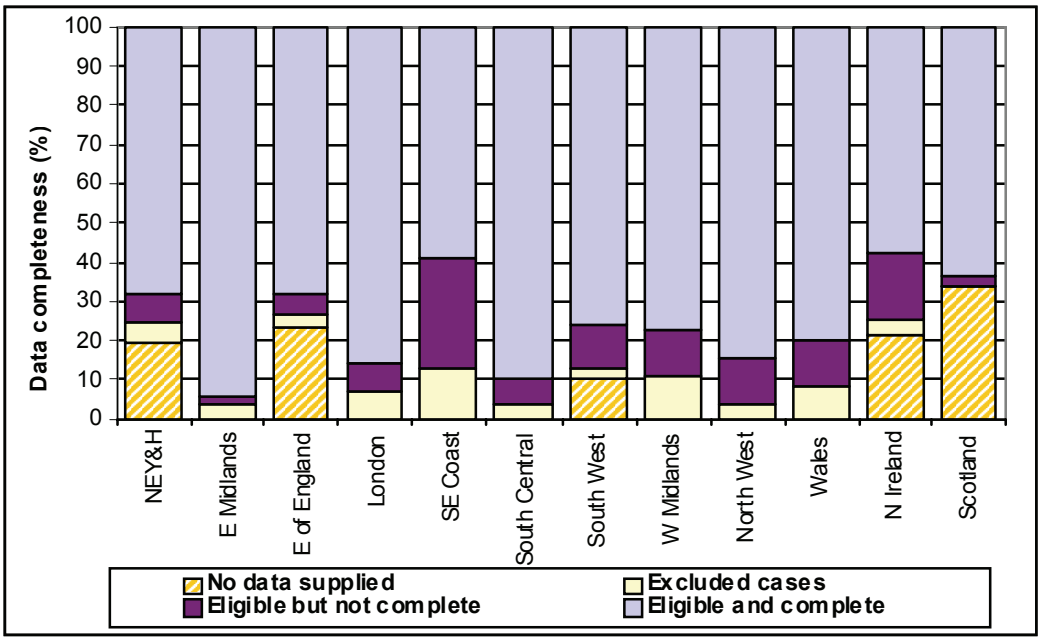

Figure 47 (Table 82): Data completeness of adjuvant analysis data

In the UK as a whole, data completeness for radiotherapy, chemotherapy and hormone therapy was 96%, 96% and 93% respectively for the 11,790 eligible cases included in the audit for which adjuvant therapy data were supplied. Complete radiotherapy, chemotherapy and hormone therapy data were available for 10,489 (89%) of these cases (Table 83). The completeness of radiotherapy, chemotherapy and hormone therapy for the eligible cases varied from 68% in South East Coast to 97% in Scotland and 98% in East Midlands.

In the UK as a whole, ER status was unknown for 388 (4%) of invasive cancers and for 1140 (49%) of non-invasive cancers (Figure 48). The proportion of invasive cancers with unknown ER status varied from 1% in Scotland and Wales to 8% in North East, Yorkshire & Humber. The proportion of non-invasive cancers with unknown ER status varied from 13% in Scotland to 77% in North East, Yorkshire & Humber. Of the 8,927 invasive cancers with known ER status, 8,036 (90%) were ER positive and 891 (10%) were ER negative. Only 76% of the 1,178 non-invasive cancers with known ER status were ER positive.

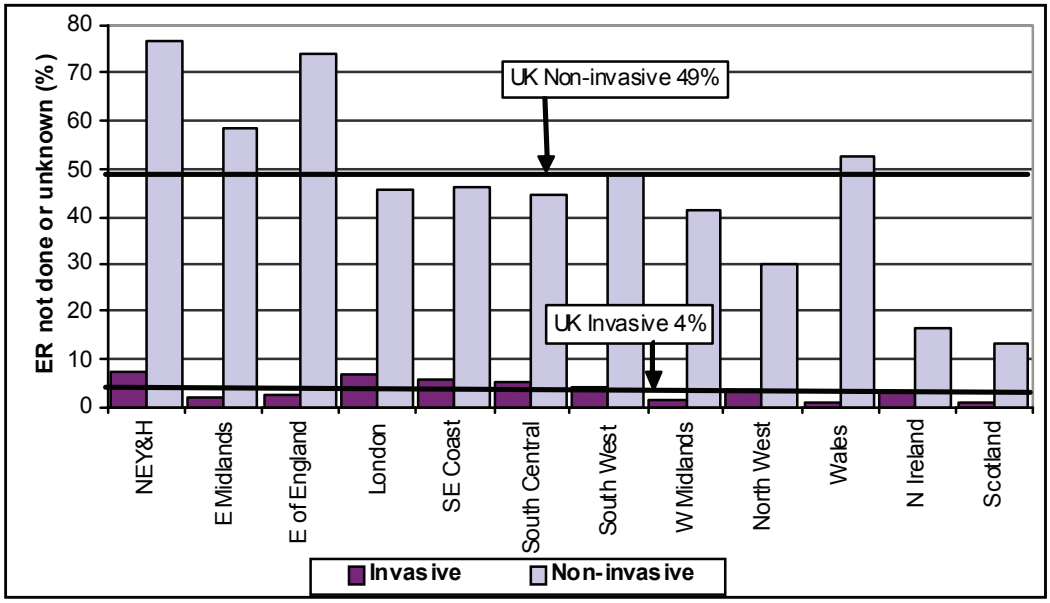

Figure 48 (Table 84): Variation in the proportion of invasive and non-invasive cancers with no ER status information provided

PgR status data were available for 6,554 (56%) of all cancers (Table 85). PgR status was known for 83% of the 891 ER negative invasive cancers, suggesting that PgR status was preferentially requested when the ER status was negative for invasive cancers. Figure 49 shows that the proportion of ER negative invasive cancers with unknown PgR status varied from 3% in South East Coast and South Central to 48% in East Midlands and 77% in Northern Ireland.

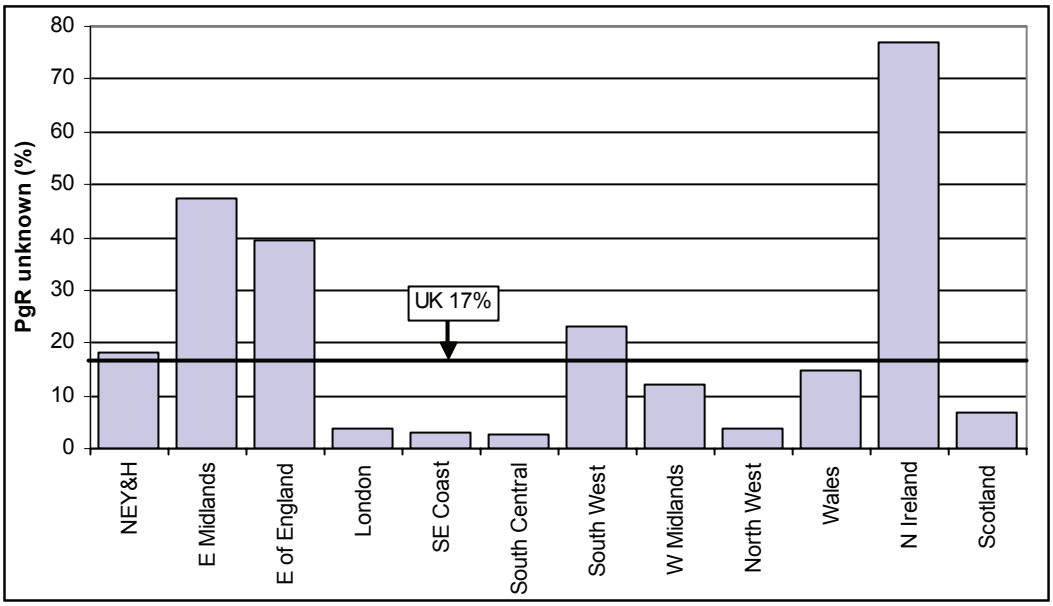

Figure 49 (Tables 86): Variation in the proportion of ER negative invasive cases with unknown PgR status

Overall, HER-2 status data were available for only 26% of the 9,315 invasive cancers included in the audit.

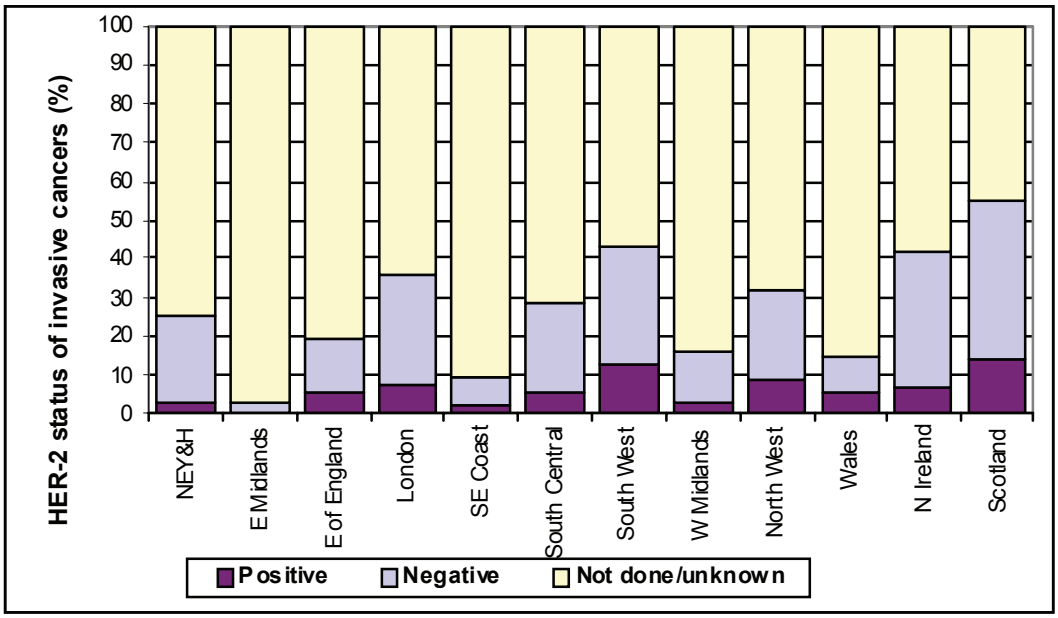

Figure 50 (Table 87): Variation in HER-2 status for invasive cancers

The proportion of cases with known HER-2 status varied from 3% in East Midlands to 55% in Scotland (Figure 50 and Table 87). Of the 2,456 invasive cancers with known HER-2 status, 571 (23%) were positive and 1,885 (77%) were negative. Regional QA reference centres and regional QA surgeons should ascertain the reasons why HER-2 status was not available for invasive cancers.

8.2 Adjuvant Treatment

Tables 88, 89 and 90 show that, of those with known adjuvant data, 7,488 (66%) cases had started radiotherapy, 1,912 (17%) had started chemotherapy and 7,980 (73%) had started hormone therapy before the audit cut off date.

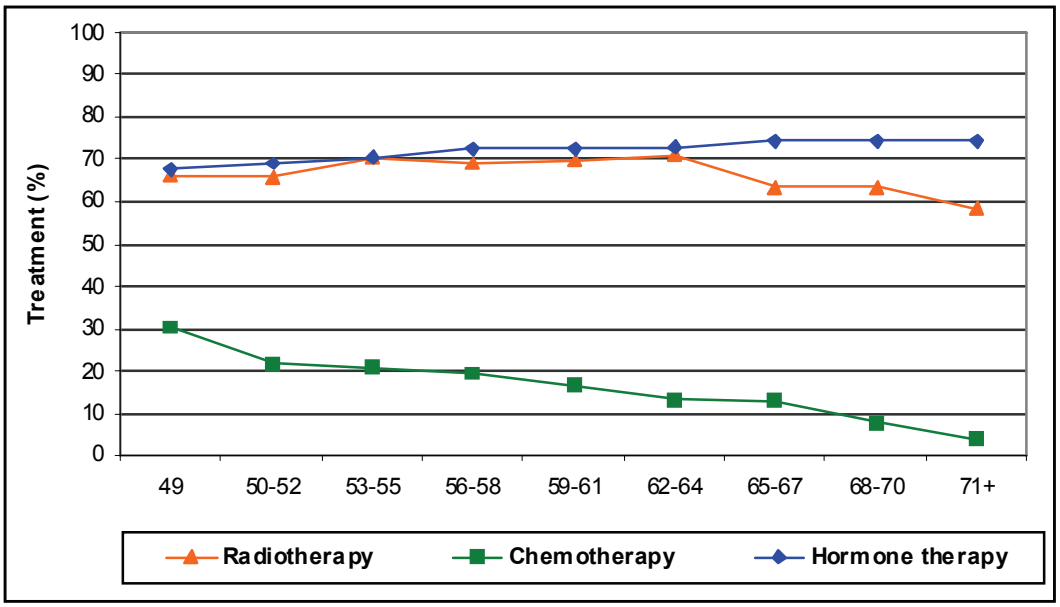

Figure 51 (Table 91): Percentage of women in each age group who had radiotherapy, chemotherapy and hormonal therapy, for cases with complete adjuvant data

A similar proportion of women aged less than 65 had started hormone therapy (71%) or radiotherapy (69%) before the audit cut off date (Figure 51). Hormone therapy was the main adjuvant treatment for women over 65; being given to 74% of the cases. Chemotherapy was the least used adjuvant therapy

in women of all ages. The proportion of women receiving chemotherapy decreased with age from 30% in women aged less than 50 to 4% in women aged over 70. There was a slight increase with age in the proportion of women receiving hormone therapy, and in women aged over 65 there was a decrease in the proportion receiving radiotherapy.

9,429 (80%) of the 11,790 cancers included in the audit had one surgical operation (diagnostic or therapeutic), 2,223 (19%) had more than one surgical operation and only 138 cases (1%) had no surgery (Table 93). The first operation was diagnostic for 799 (7%) of the 11,652 women who had surgery (Table 94). Surgery, radiotherapy and hormone therapy as a combination of treatment was the most common treatment pattern, and 44% (4,652 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 7,488 women given radiotherapy, 6,173 (82%) had one operation and 1,283 (17%) had more than one operation (Table 95). Of the 1,912 women given chemotherapy 1,526 (80%) had one operation, 357 (19%) had more than one operation and 29 (2%) had no surgery (Table 96).

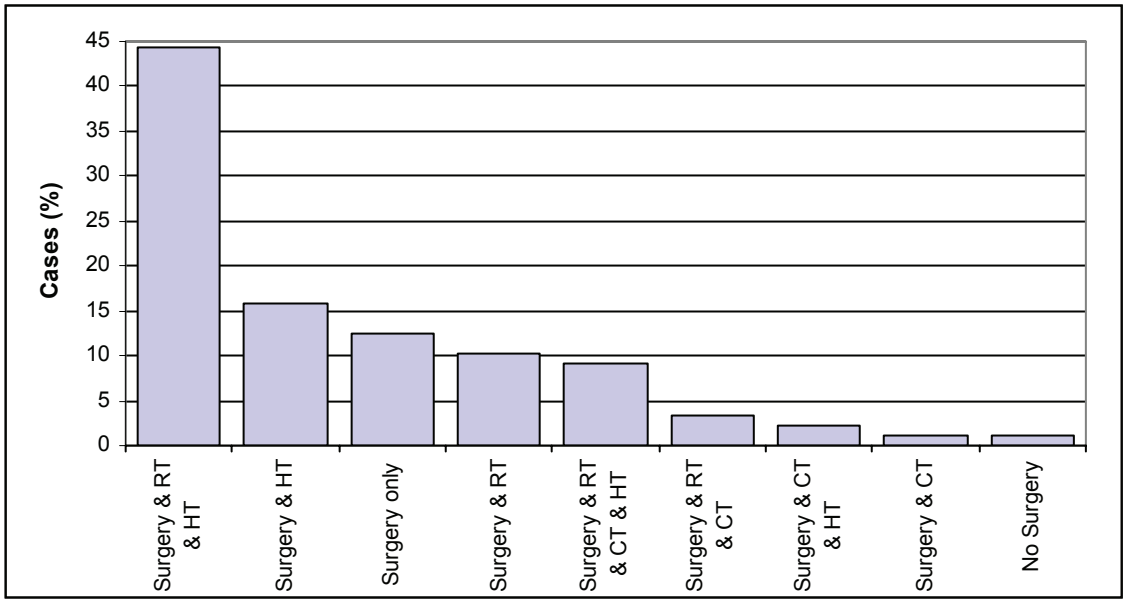

Figure 52 (Table 92): Combinations of treatment, expressed as a percentage of cases with complete adjuvant data

COMMENT:

- 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 22% in women aged 50-52 to 8% in women aged 68-70.
- 44% of women received the most common treatment for screen detected breast cancer in the UK which was surgery, radiotherapy, and hormone therapy.
- ER status was unknown for 388 (4%) of invasive cancers and 49% of non-invasive cancers. 86% of invasive cancers were ER positive.
- PgR status data were available for 83% of ER negative invasive cancers.
- HER-2 status data were available for only 26% of the invasive cancers. Of the 2,456 invasive cancers with known HER-2 status, 23% were positive. Regional QA reference centres and regional QA surgeons should ascertain the reasons why HER-2 status was not available.

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 98 to 101 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, 94% of women with a non-operative diagnosis had their therapeutic surgery within 60 days (Figure 53), but only 83% of women who had diagnostic surgery had their open surgical biopsy within 60 days of 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 to obtain a non-operative diagnosis are made.

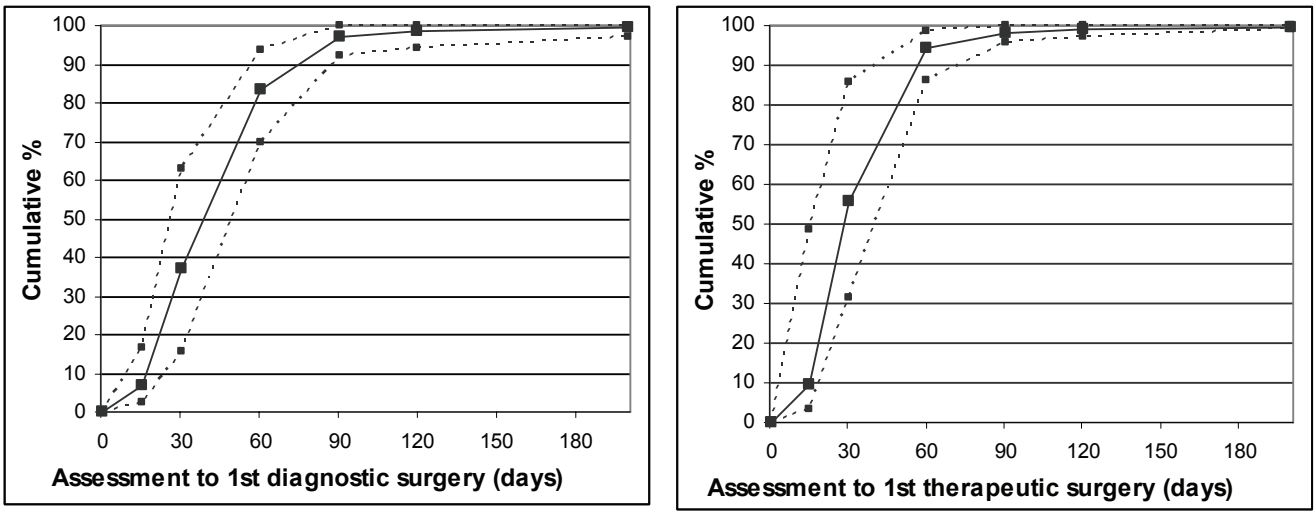

Figure 53 (Tables 98 & 99): The cumulative percentage of cases with diagnostic surgery (left) and the cases with a non-operative diagnosis (right) who had therapeutic surgery up to 200 days after assessment

The left hand graph in Figure 54 shows the time taken from final surgery to radiotherapy, excluding those cases with neo-adjuvant radiotherapy. As start dates of chemotherapy and hormone therapy were not collected, cases with chemotherapy before radiotherapy are not excluded in this analysis. In the UK as a whole, only 33% of women received radiotherapy within 60 days of their final surgery and just 63% of cases within 90 days. 9% of women had not received radiotherapy 200 days after their final surgery. Regional QA reference centres should review these cases. The median number of days between final surgery and radiotherapy varied from 58 days in East of England to 112 days in North East, Yorkshire & Humber and 113 days in South East Coast.

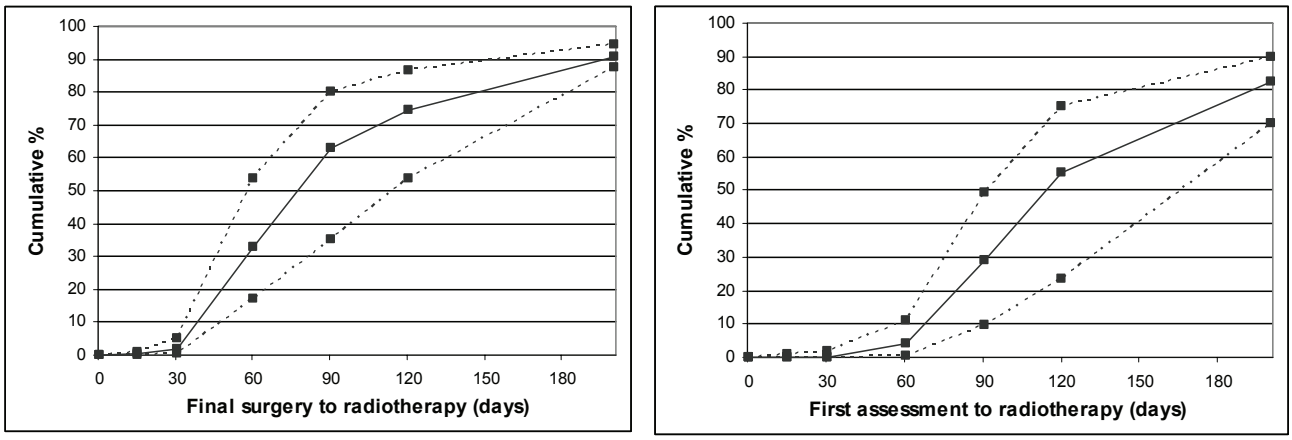

Figure 54 (Table 100 & 101) : The cumulative percentage of cases with surgery and adjuvant radiotherapy, who had radiotherapy up to 200 days after final surgery (left) and first assessment (right)

The right hand graph in Figure 54 shows that only 29% of the women who had radiotherapy had started treatment within 90 days of their first assessment. 17% of women had not started radiotherapy even 200 days after their first assessment. In the UK as a whole, the median number of days from assessment to radiotherapy was 113. This varied from 91 days in East of England to 162 days in South East Coast. Comparison of Figures 53 and 54 shows that waiting time for radiotherapy is the main factor determining the length of time taken from assessment and final surgery to radiotherapy.

MEDIAN DAYS BETWEEN THERAPIES

	Assessment to …				*Final surgery to …*	
Region	***Diagnostic surgery*** *(Table 99)*	***Therapeutic surgery*** *(Table 100)*	***RT (1 op)***	***RT (>1op)***	***RT (1 op)***	***RT (>1 op)***
N East, Yorks & Humber	*35*	*28*	*141*	*181*	*111*	*121*
East Midlands	*29*	*27*	*90*	*134*	*63*	*60*
East of England	*27*	*27*	*88*	*112*	*59*	*55*
London	*35*	*32*	*108*	*145*	*69*	*72*
SE Coast	*50*	*39*	*152*	*200*	*111*	*122*
South Central	*35*	*25*	*112*	*149*	*83*	*82*
South West	*40*	*32*	*113*	*148*	*77*	*73*
West Midlands	*36*	*26*	*97*	*129*	*68*	*62*
North West	*36*	*29*	*112*	*141*	*83*	*71*
Wales	*26*	*25*	*97*	*156*	*72*	*88*
Northern Ireland	*29*	*15*	*95*	*145*	*70*	*66*
Scotland	*41*	*31*	*99*	*134*	*64*	*63*
United Kingdom	***36***	***29***	***106***	***146***	***75***	***74***

COMMENT:

- 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 33% of cases received radiotherapy within 60 days of their final surgery. Women in North East, Yorkshire & Humber and South East Coast experienced the longest waits for radiotherapy.

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 treated with conservation surgery should normally receive radiotherapy

Of the 11,303 cases with radiotherapy data available, 79% were invasive and 20% were non-invasive (Table 102). 6,407 (72%) of the invasive cancers were treated with conservation surgery (Table 103). Of these, 563 (9%) did not have adjuvant radiotherapy recorded (Table 104). 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 varied from 2% in Wales to 23% in South East Coast. Of the 1,618 non-invasive cancers treated with conservation surgery, 816 (50%) did not have adjuvant radiotherapy recorded (Table 106). This varied from 17% in Northern Ireland to 67% in South East Coast.

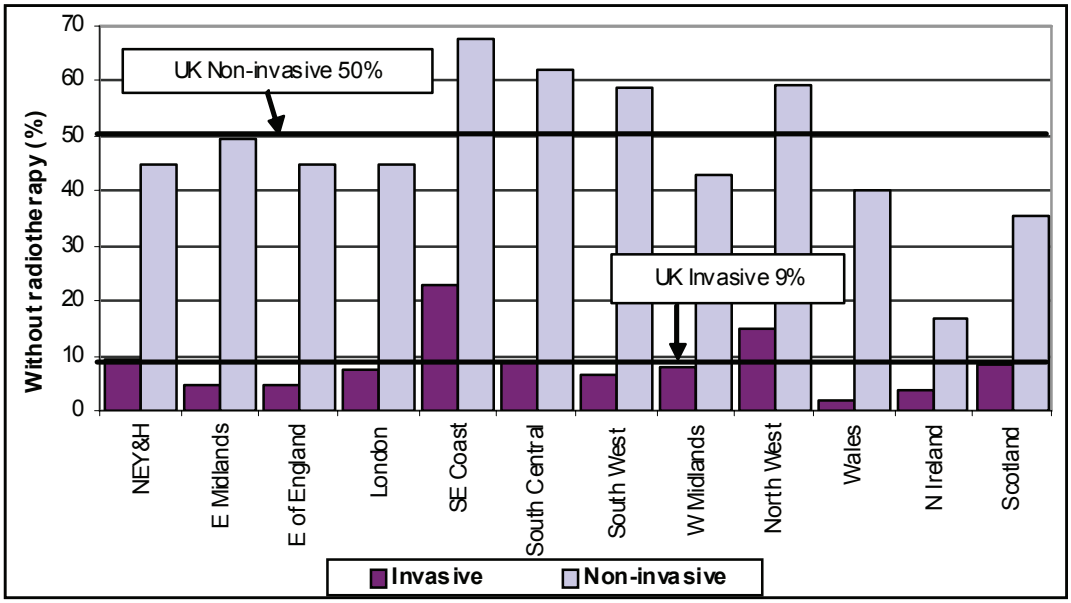

Figure 55 (Tables 104 & 106): The proportion of conservatively treated invasive cancers and non-invasive cancers that did not receive radiotherapy

In the UK as a whole, the majority (66%) of conservatively treated invasive cancers not given adjuvant radiotherapy were small (<15mm diameter) (Table 105). However, a total of 77 cancers were at least 20mm in diameter. Regional QA reference centres and regional QA surgeons should determine the reasons why these larger conservatively treated invasive cancers did not receive adjuvant radiotherapy.

In the UK as a whole, 66% of the 816 conservatively treated non-invasive cancers not given adjuvant radiotherapy were other (low or intermediate) cytonuclear grade (Table 107) and 61% were small (<15mm diameter) (Table 108). 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.

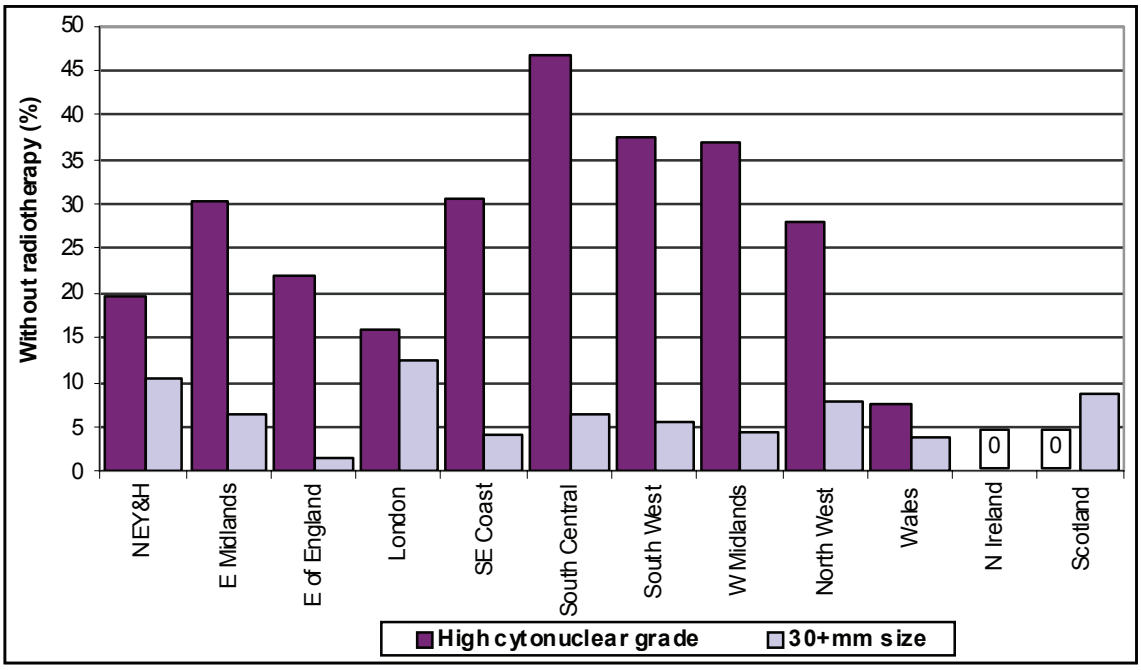

Figure 56 (Tables 107&108): The proportion of conservatively treated non-invasive cancers with high cytonuclear grade and size greater than 30mm which did not receive radiotherapy

In South Central, 47% (36 cases) of non-invasive cancers not given adjuvant radiotherapy were high cytonuclear grade, and 40% (31 cases) 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.

The following summary table 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 2002/03 to 2004/05. Regions where the proportion of cancers not receiving radiotherapy is 5% or more in excess of the UK average are shaded.

CONSERVATIVELY TREATED CANCERS WITHOUT RADIOTHERAPY

	Invasive						Non-invasive					
	2002/03		2003/04		2004/05		2002/03		2003/04		2004/05	
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
N East, Yorks & Humber	20	5	37	8	67	9	48	43	65	52	97	45
East Midlands	25	5	26	5	24	5	63	49	53	40	63	49
East of England	43	9	24	5	24	5	69	52	66	47	64	44
London	77	14	37	7	46	7	48	57	66	46	57	45
South East Coast	70	18	67	13	95	23	82	61	80	56	101	67
South Central	100	23	81	15	48	9	61	72	57	52	77	62
South West	55	10	49	8	44	6	73	59	99	55	112	59
West Midlands	32	8	12	3	56	8	45	59	35	53	65	42
North West	88	16	68	10	114	15	58	52	73	49	115	59
Wales	6	3	51	20	7	2	18	45	54	61	26	40
Northern Ireland	13	15	8	8	3	3	9	32	8	30	4	17
Scotland	21	5	32	6	35	8	33	28	33	26	35	35
UK	**550**	**11**	**492**	**9**	**563**	**9**	**607**	**52**	**689**	**48**	**816**	**50**

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

CONCLUSION 1

91% of women with invasive cancer treated with conservation surgery received adjuvant radiotherapy, compared to only 50% of women with conservatively treated non-invasive cancer. 66% of the 563 conservatively treated invasive cancers without adjuvant radiotherapy were small (<15mm) tumours. 66% of the 816 conservatively treated non-invasive cancers without radiotherapy recorded were other (low or medium) cytonuclear grade and 61% were small (<15mm) in diameter. Regional QA reference centres and QA surgeons should audit the cancers in their regions to determine the reasons why their treatment appears to have differed from that suggested in Proposition 1.

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 11,377 cancers with known chemotherapy data, 222 (2%) were recorded as ER negative, node positive invasive cancers and 600 (5%) were recorded as ER negative, node negative invasive cancers (Table 109). Of the 222 ER negative, node positive invasive cancers, 29 (13%) did not receive chemotherapy (Figure 57). This varied from 0% in East Midlands, Wales and Scotland to 23% in South Central and 21% in North West.

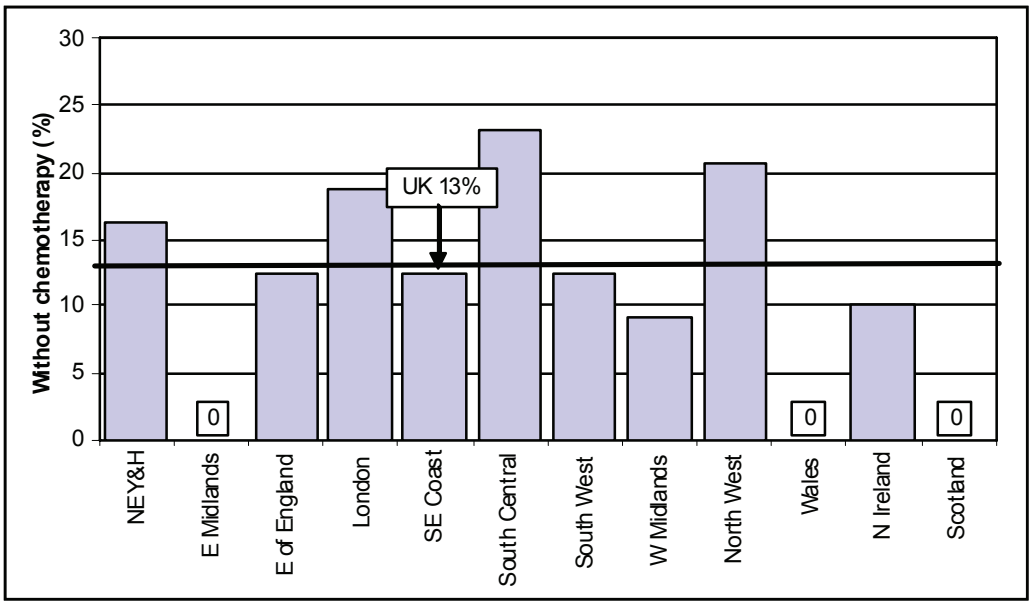

Figure 57 (Table 110): The proportion of ER negative, node positive invasive cancers that did not receive chemotherapy

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 2002/03 to 2004/05. Regions where the proportion of cancers not receiving chemotherapy 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						
	2002/03		2003/04		2004/05	
Region	No.	%	No.	%	No.	%
N East, Yorks & Humber	2	10	8	22	5	16
East Midlands	3	19	1	4	0	0
East of England	2	10	0	0	1	13
London	6	32	3	18	3	19
South East Coast	2	14	3	21	2	13
South Central	1	8	6	33	6	23
South West	1	5	2	11	3	13
West Midlands	0	0	2	10	2	9
North West	3	17	4	19	6	21
Wales	1	8	3	19	0	0
Northern Ireland	0	0	0	0	1	10
Scotland	6	27	7	26	0	0
UK	**27**	**14**	**39**	**17**	**29**	**13**

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

Of the 600 ER negative, node negative invasive cancers, 339 (57%) did not receive chemotherapy (Table 111). This varied from 32% in Scotland and 33% in Northern Ireland to 76% in South Central. 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 Northern Ireland where the highest proportion of ER negative node negative cancers received chemotherapy. Overall, 83% of the 261 ER negative, node negative invasive cancers given chemotherapy were Grade III (Table 112). Only 2 cancers were Grade I and 42 (16%) were Grade II. 60 (23%) cases were HER-2 positive.

CONCLUSION 2

13% of women with ER negative, node positive invasive cancers did not have chemotherapy recorded compared to 57% of ER negative, node negative invasive cancers. This suggests that nodal status was taken into account when deciding whether women would benefit from chemotherapy. 83% of the 261 ER negative, node negative invasive cancers given chemotherapy were Grade III and 23% were HER-2 positive. Regional QA reference centres and QA surgeons should audit the cancers in their regions to determine the reasons why their treatment appears to have differed from that suggested in Proposition 2.

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 10,993 cancers with complete hormone therapy data included in the adjuvant therapy analysis, 8,645 (79%) were ER positive, 1,147 (10%) ER negative and for 1,201 (11%) either the ER status tests were not done or the ER status was unknown (Table 113). 90% of the ER positive cancers with known hormone therapy data were invasive and 10% non-invasive (Table 114).

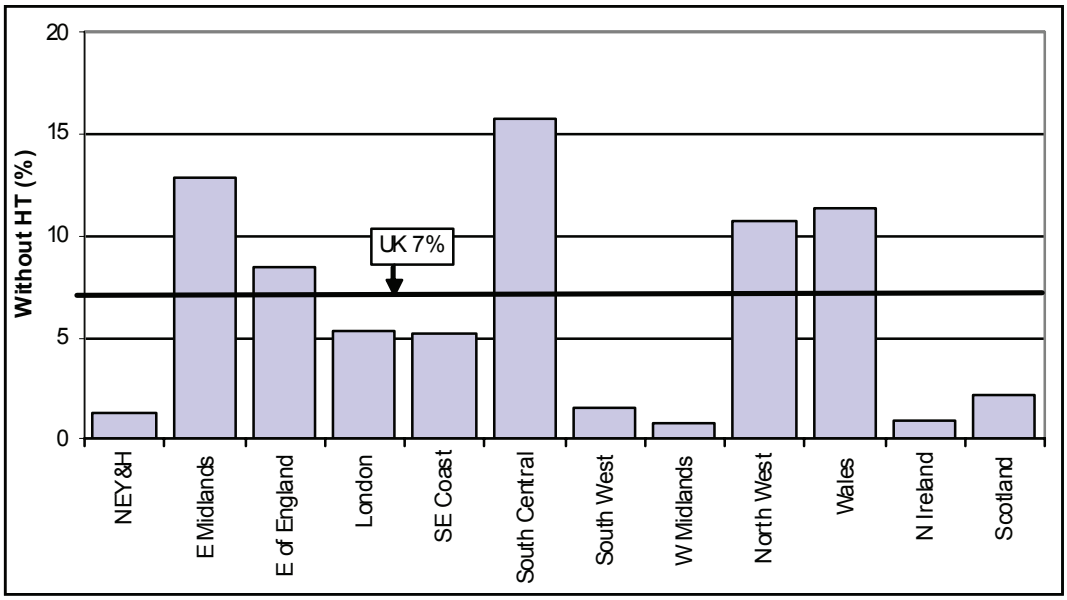

Figure 58 (Table 115): Variation in proportion of ER positive, invasive cancers that did not receive hormone therapy

In the UK as a whole, 508 (7%) ER positive, invasive cancers did not receive hormone therapy (Table 115). This varied from 1% in Northern Ireland (1 out of 114 cancers), West Midlands (6 out of 731 cancers) and North East Yorkshire & Humber (12 out of 923 cancers) to 16% in South Central (98 out of 621 cancers) (Figure 58).

ER POSITIVE INVASIVE CANCERS WITHOUT HORMONE THERAPY

	2002/03		2003/04		2004/05	
Region	**No.**	%	**No.**	%	**No.**	%
N East, Yorks & Humber	41	6	15	2	12	1
East Midlands	68	11	78	11	90	13
East of England	29	5	54	10	51	8
London	37	6	40	6	39	5
South East Coast	30	6	15	3	28	5
South Central	20	4	39	6	98	16
South West	16	3	18	3	12	2
West Midlands	13	3	11	2	6	1
North West	53	8	90	11	105	11
Wales	72	18	166	36	54	11
Northern Ireland	0	0	2	2	1	1
Scotland	27	5	30	4	12	2
UK	**406**	**6**	**558**	**8**	**508**	**7**

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

The table above 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 2002/03 to 2004/05. 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.

In the UK as a whole, 37% (17 cases) of ER negative, PgR positive invasive cancers did not receive hormone therapy (Table 116). 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, 93 ER negative cancers (8%) received hormone therapy (Table 117). 29 (31%) of these cancers were PgR positive (Table 116). 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.

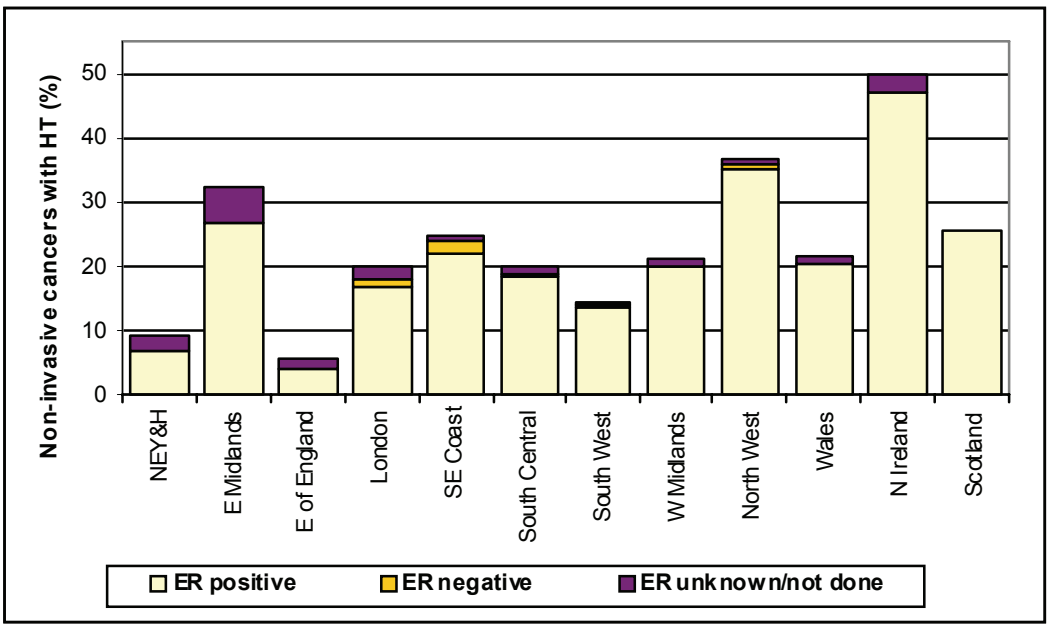

Figure 59 (Table 118): Variation in proportion of non-invasive cancers that received hormone therapy

The proportion of non-invasive cancers treated with hormone therapy varied markedly between regions from 6% in East of England and 9% in North East, Yorkshire & Humber to 50% in Northern Ireland (Table 118). Of the 460 non-invasive cancers with known ER status treated with hormone therapy, 448 were ER positive and 12 were ER negative. A further 37 non-invasive cancers with unknown ER status were also treated with hormone therapy. In East Midlands 5% of the non-invasive cancers were treated with hormone therapy without known ER status recorded. 375 ER positive, non-invasive cancers did not receive hormone therapy (Table 119). 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, 7% of ER positive, invasive cancers and 37% of ER negative, PgR positive invasive cancers did not have hormone therapy recorded and 8% 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 status.

8.4.4 ER Negative, PgR Negative Invasive Cancers and Chemotherapy

PROPOSITION 4

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

In the UK as a whole, 310 (46%) invasive cancers with ER negative PgR negative status did not receive chemotherapy (Figure 60). This varied between 19% (8 out of 42 cancers) in Scotland to 61% (42 out of 69 cancers) in South Central.

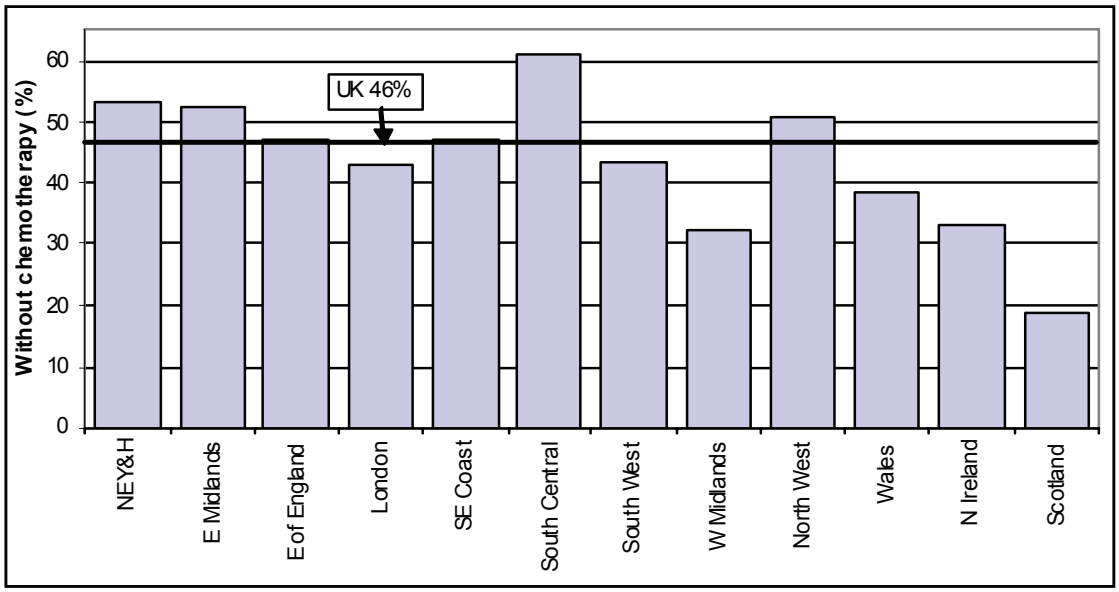

Figure 60 (Tables 120): Proportion of ER negative, PgR negative invasive cancers that did not receive chemotherapy

CONCLUSION 4

46% of ER negative, invasive cancers with negative PgR status did not have chemotherapy recorded. Regional QA reference centres and regional QA surgeons should determine the reasons why chemotherapy therapy does not appear to have been given to these cancers.

8.4.5 HER-2 Status and Chemotherapy

PROPOSITION 5

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

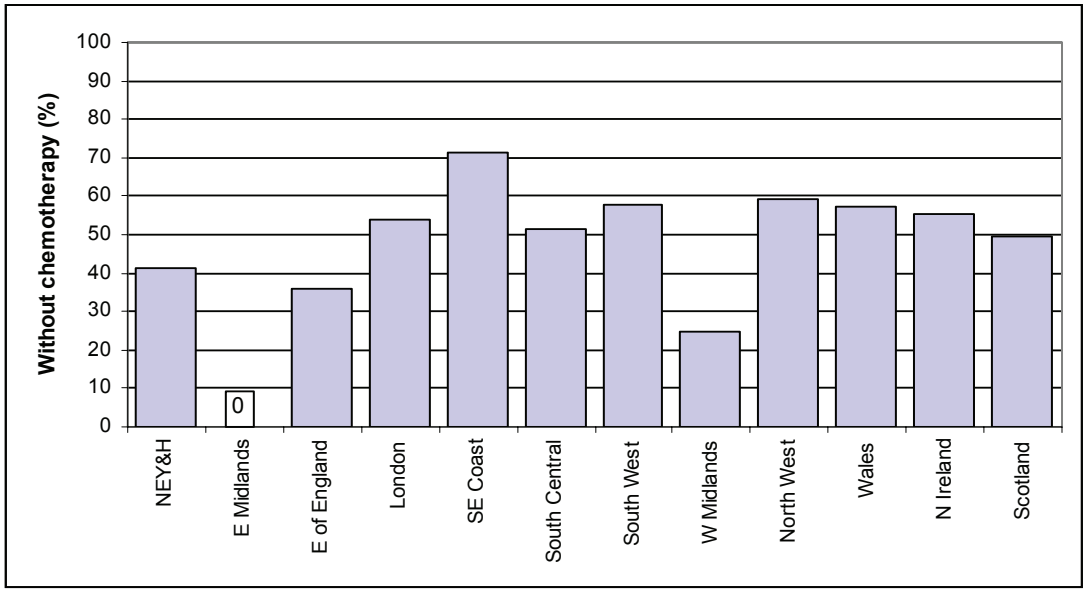

Figure 61(Table 121): Proportion of HER-2 positive invasive cancers that did not receive chemotherapy

In the UK as a whole, HER-2 status was known for 2,456 (26%) of invasive cancers (Table 87). Of these, 571 were HER-2 positive. For 290 (51%) of these cases, no chemotherapy treatment was recorded (Table 121). This varied between 0% (0 out of 4 cases) in East Midlands to 71% (10 out of 14 cases) in South East Coast. 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.

CONCLUSION 5

290 (51%) HER-2 positive cases did not have chemotherapy recorded. 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***
Region	***Invasive conservation surgery, no RT*** *(Table 104)*	***Non-invasive conservation surgery, no RT*** *(Table 106)*	***ER negative node positive invasive no CT*** *(Table 110)*	***ER positive invasive no HT*** *(Table 115)*	***ER negative PgR positive invasive no HT*** *(Table 119)*	***ER negative with HT*** *(Table 117)*	***ER negative PgR negative invasive no CT*** *(Table 120)*	***HER-2 positive invasive cancers no CT*** *(Table 121)*
NEY&H	*9*	*45*	*16*	*1*	*17*	*5*	*53*	*41*
East Midlands	*5*	*49*	*0*	*13*	*60*	*6*	*53*	*0*
E of England	*5*	*44*	*13*	*8*	*67*	*3*	*47*	*36*
London	*7*	*45*	*19*	*5*	*17*	*14*	*43*	*52*
SE Coast	*23*	*67*	*13*	*5*	*0*	*14*	*47*	*71*
South Central	*9*	*62*	*23*	*16*	*56*	*21*	*61*	*50*
South West	*6*	*59*	*13*	*2*	*0*	*6*	*43*	*57*
West Midlands	*8*	*42*	*9*	*1*	*50*	*4*	*32*	*21*
North West	*15*	*59*	*21*	*11*	*33*	*8*	*51*	*58*
Wales	*2*	*40*	*0*	*11*	*0*	*8*	*38*	*57*
N Ireland	*3*	*17*	*10*	*1*	*-*	*6*	*33*	*56*
Scotland	*8*	*35*	*0*	*2*	*-*	*2*	*19*	*49*
UK	***9 (563/6407)***	***50 (816/1618)***	***13 (29/222)***	***7 (508/7764)***	***37 (17/46)***	***8 (93/1147)***	***46 (310/677)***	***51 (290/571)***

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 April 2000 and 31 March 2001 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 March 2006, enabling survival for a period of up to 5 years post diagnosis to be calculated. By liaising with the cancer registries serving their population, 11 of the 12 regional QA reference centres were able to provide complete data for this analysis. Scotland was unable to provide data for this part of the audit.

Age at diagnosis, invasive grade, invasive tumour size and nodal status were requested from the screening services for cases detected in 2000/2001. 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 9,105 breast cancers detected by screening between 1 April 2000 and 31 March 2001 were submitted to the survival audit. Of these, 291 cancers (3%) were excluded if one of the following reasons applied.

- Unknown invasive status (14 cases)
- Case not registered at the regional cancer registry or registered with an unknown diagnosis date (206 cases)
- Screen detected cancer not confirmed to be the first primary breast tumour, either because it was flagged as a recurrence or contralateral cancer at the cancer registry/screening unit (49 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 (22 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 2000/01 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	23	2	10	1	24	2	1,245	97	**1,278**
East Midlands	20	2	5	1	24	3	792	97	**817**
East of England	98	10	0	0	28	3	875	89	**982**
London	18	2	3	0	58	6	907	97	**937**
South East Coast	4	1	0	0	3	0	779	98	**791**
South Central	0	0	15	2	22	3	678	98	**693**
South West	23	3	0	0	51	6	880	97	**908**
West Midlands	0	0	8	1	1	0	789	99	**798**
North West	20	2	4	0	56	5	1,071	98	**1,098**
Wales	0	0	4	1	18	3	560	99	**565**
Northern Ireland	0	0	0	0	5	2	238	100	**238**
Scotland	-	-	-	-	-	-	-	-	**-**
United Kingdom	**206**	**2**	**49**	**1**	**290**	**3**	**8,814**	**97**	**9,105**

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

The proportion of eligible cases increased by 1% to 97% in 2000/01 compared with 1999/2000. However, the number of cases, which were still not registered in August 2006, increased from 182 for 1999/2000 to 206 for 2000/01. 98 (48%) of these cases were in East of England. The Eastern Cancer Registration and Intelligence Centre and the East of England QA reference centre should determine the reasons why these cases were not registered. All QA reference centres should ensure that all screen detected cancers are passed to their local cancer registry for registration in the future.

The summary table below shows that the data completeness of the cancers included in the survival audit has improved markedly since 1992/93.

9 YEAR COMPARISON: DATA COMPLETENESS FOR INVASIVE CANCERS (%)

Year of data collection	Unknown size	Unknown grade	Unknown nodal status	Unknown NPI
1992/93	7	21	43	54
1993/94	5	20	40	51
1994/95	3	14	31	40
1995/96	2	11	28	35
1996/97	2	5	20	25
1997/98	2	5	16	20
1998/99*	1	3	11	14
1999/00	1	2	7	10
2000/01	1	3	8	11

* Data include cases from Scotland

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 March 2006) together with text from the death certificate to give the exact cause of death.

Table 123 shows that there were a total of 5 deaths (4%) recorded amongst the 119 women with micro-invasive cancer detected by screening. 4 were from the screen detected breast cancer and 1 was a non cancer death. Of the 58 deaths (3%) in the 1,688 women with non-invasive cancer, 24 (41%) were attributed to the tumour detected by screening, 16 (28%) were from a cancer other than the screen detected breast cancer and 16 (28%) were non cancer deaths (Table 124).

Overall, 69% of the 577 deaths among the 7,007 women with invasive cancer were recorded as being due to the screen detected breast cancer, 9% were due to a cancer other than the screen detected breast cancer and 21% due to non cancer related causes. Death cause was unknown for 7 women (1%). There was, however, still some regional variation in the proportions of women with invasive cancer recorded as dying from each cause of death. For instance, in Wales only, 61% of the deaths in women with invasive cancer were attributed to the screen detected breast cancer, compared to 85% in Northern Ireland (Table 122). The basis for these continuing differences is still being investigated by the UK Association of Cancer Registries.

9.4 5 year Relative Survival Rates for Cancers Diagnosed in 2000/01

Each year, the ABS at BASO survival audit collects a new cohort of cancer data in order to provide the latest 5 year survival figure. In the UK as a whole, 5 year relative survival has remained relatively constant in the last three audit periods, increasing slightly from 95.8% (95% CI 95.1%-96.5%) in 1998/99 to 96.4% (95% CI 95.7%-97.0%) in 2000/01 (Table 125). Figure 62 shows the regional variation in 5 year survival compared to the UK figure for cases diagnosed in 2000/01. London had the highest relative survival at 98.1%, and West Midlands and North West the lowest at 95.6%. The differences between regional survival rates are not statistically significant.

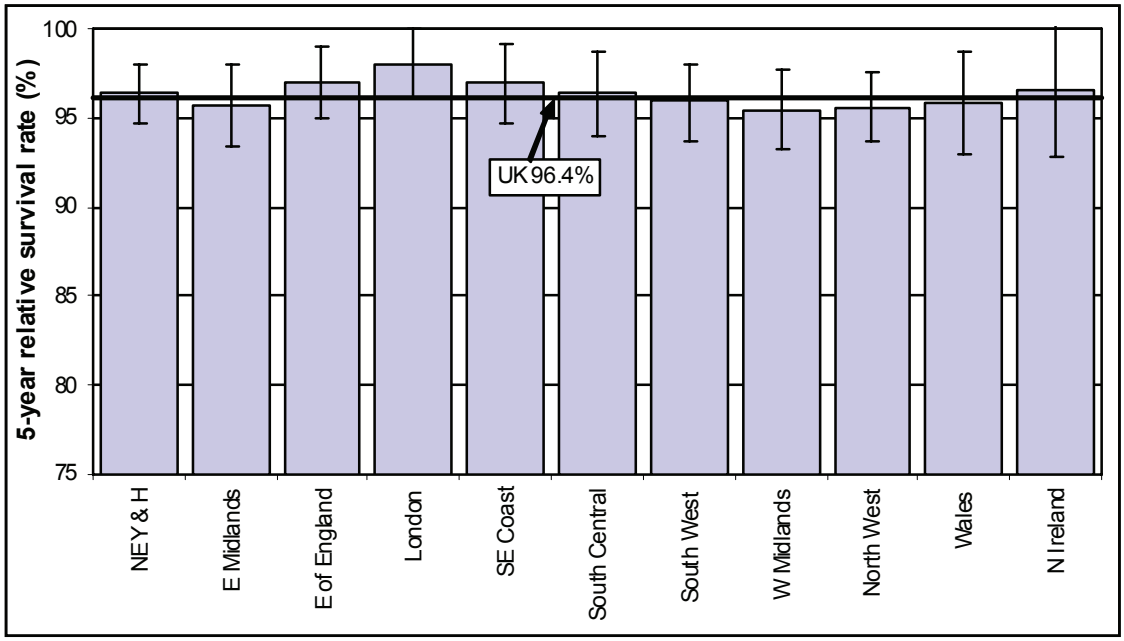

Figure 62 (Table 125): 5 year relative survival for women with screen detected invasive breast cancer diagnosed in 2000/01
(No survival data were available for Scotland)

9.5 Variation in Relative Survival with Tumour Characteristics

The following table shows the characteristics of the cancers included in the 2000/01 survival audit. 83% of the invasive cancers included in the audit were diagnosed in women aged 50-64 years. 74% of the cancers were less than 20mm in diameter, 79% of the cancers were Grade I or II and 69% were node negative.

Parameter		Cancers included in each analysis group	
		Number	%
Invasive status	Invasive	7007	79
	Micro-invasive	119	1
	Non-invasive	1688	19
Age group (invasive cancers only)	<50	137	2
	50-52	1397	20
	53-55	1131	16
	56-58	1070	15
	59-61	1114	16
	62-64	1122	16
	65-68	558	8
	69-70	172	2
	71+	295	4
	Total	7007	100
Invasive cancer size	<10mm	1694	24
	10-<20mm	3479	50
	20-<49mm	1688	24
	50mm+	86	1
	Unknown	60	1
	Total	7007	100
Invasive grade	Grade I	2282	33
	Grade II	3266	47
	Grade III	1161	17
	Not assessable	105	1
	Unknown	193	3
	Total	7007	100
Nodal status (invasive cancers only)	Negative	4833	69
	Positive	1643	23
	Unknown	531	8
	Total	7007	100
NPI group (invasive cancers only)	EPG	1602	23
	GPG	2212	32
	MPG1	1383	20
	MPG2	642	9
	PPG	388	6
	Unknown	780	11
	Total	7007	100

9.5.1 Variation in Relative Survival with Invasive Status

The following table shows that in the last 3 survival audits, the 5 year relative survival for non-invasive cancers is higher than 100%. Moreover, the lower limits of the 95% confidence intervals for the 5 year relative survival of women with non-invasive cancers are over 100%. This indicates that their chance of survival is no worse than that of the UK female population as a whole.

EFFECT OF INVASIVE CANCER STATUS ON RELATIVE SURVIVAL			
	1998/99	1999/00	2000/01
Invasive	*95.8 (95.1,96.5)*	*96.5 (95.8,97.2)*	*96.4 (95.7,97.0)*
Micro-invasive	*100.7 (97.8,103.7)*	*97.5 (93.0,102.1)*	*99.5 (95.6,103.5)*
Non-invasive	*101.3 (100.5,102.1)*	*101.1 (100.3.101.9)*	*100.5 (99.7,101.4)*

9.5.2 Variation in Relative Survival of Invasive Cancers with Age Group

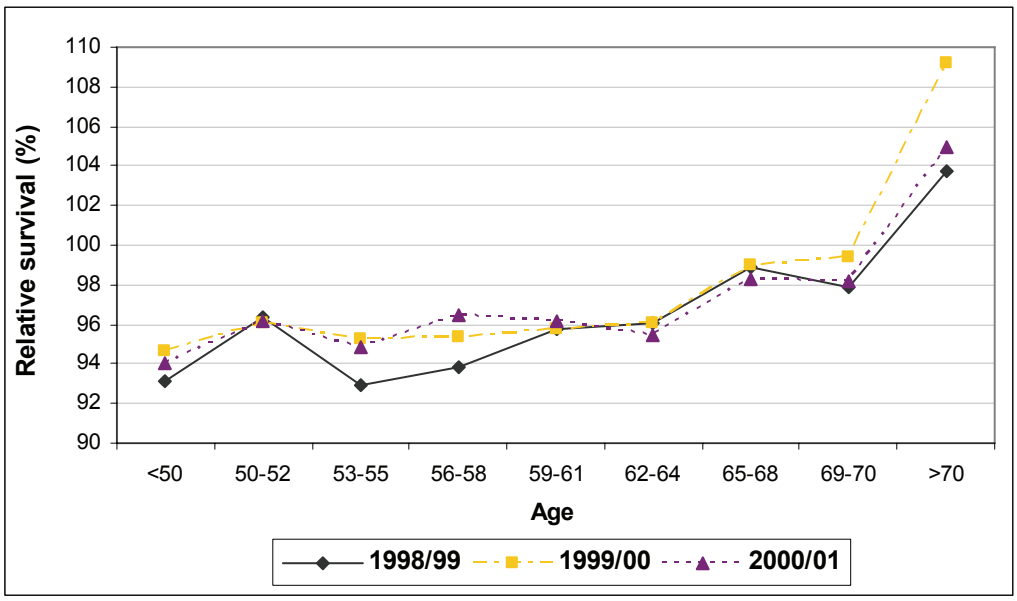

Figure 63 (Table 126): Variation in 5 year relative survival with age for women with screen detected invasive breast cancer

Table 126 and Figure 63 show the variation with age at diagnosis in the 5 year relative survival rates of women diagnosed with primary invasive cancer. There was, however, no statistical difference in the relative survival rates for women in the different age bands. The 5 year relative survival rate in 2000/01 was the highest for women aged over 70.

This effect, which is similar to that seen for non-invasive cancers diagnosed via screening may be due to a number of factors. Firstly, it is possibly that routine follow-up appointments result in the earlier diagnoses 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 in the time periods studied in the survival analysis 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 48% 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 Variation in Relative Survival of Invasive Cancers with Tumour Size, Grade and Nodal Status

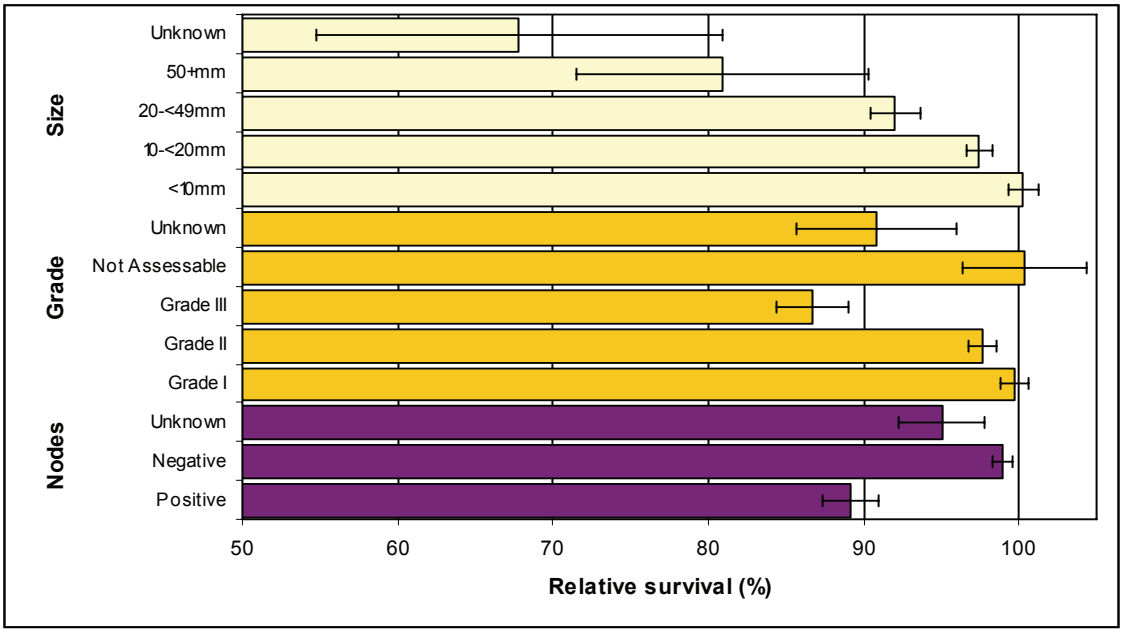

Figure 64 (Table 127, 128 & 129): Variation in 5 year relative survival with nodal status, grade and size for women with screen detected invasive breast cancer

Figure 64 shows how 5 year relative survival rates vary with tumour size, grade and nodal status. The 5 year relative survival of women with less than 10mm diameter cancers was no worse than that of the female UK population as a whole. At 80.9% (95% CI 71.5%-90.4%), 5 year relative survival was significantly lower for cancers with diameter greater than 50mm (1% of the cohort). 5 year relative survival rate was also significantly lower for Grade III cancers (17% of the cohort) at 86.7% (95% CI 84.4%-89.0%) and for node positive cancers (23% of the cohort) at 89.2% (95% CI 87.4%-91.0%). The 5 year relative survival of node negative cancers was 99.0% (95% CI 98.3%-99.6%).

9.5.4 Variation in Relative Survival of Invasive Cancers with NPI Group

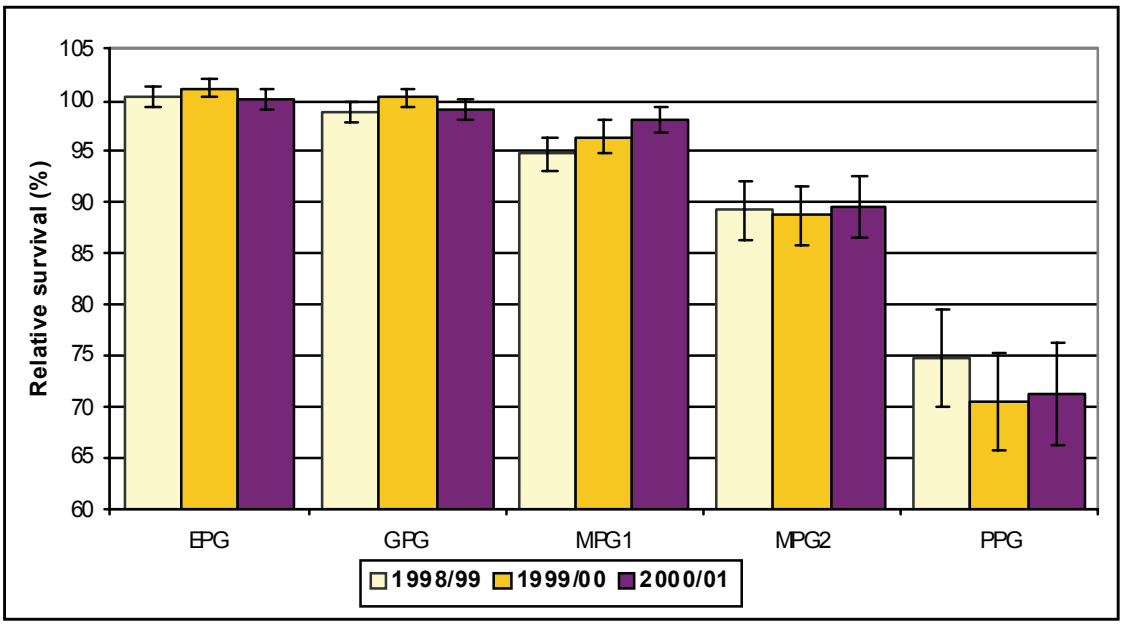

Figure 65 (Table 130): Variation in relative survival with NPI group for women with screen detected invasive breast cancer

The Nottingham Prognostic Index (NPI) is a combined score derived from the invasive size, grade and nodal status of an invasive cancer. Figure 65 shows how relative survival rates varied with NPI score at diagnosis. The 5 year relative survival rate in 2000/01 for cancers in the excellent prognostic group (EPG) was 100.2% (95% CI 99.2%-101.2%), and for cancers in the good prognostic group (GPG) and moderate prognostic group 1 (MPG1) was 99.1% (95% CI 98.1%-100.1%) and 98.1% (95% CI 96.8%-99.4%) respectively. There has been no significant change in the 5 year relative survival in these three prognostic groups in the 3 year period from 1998/99 to 2000/01.

At 89.6% (95% CI 86.7%-92.4%), the 5 year relative survival for the 9% of cancers in moderate prognostic group 2 (MPG2) was significantly worse than that of cancers in the EPG and GPG groups. The 5 year relative survival of the 6% of cancers in the PGP group was even lower at 71.2% (95% CI 66.2%-76.2%).

COMMENT:

- Of the 9,105 cancers with known invasive status submitted to the survival analysis for the period 1 April 2000 to 31 March 2001, 206 (2%) were excluded because they were not registered at cancer registries. A further 71 cancers (1%) were excluded because they were not confirmed to be primary tumours and 14 more because their invasive status was not known.
- The survival analysis included 8,814 screen detected cancers. Data completeness has improved markedly in the 8-year history of the audit with only 11% of cancers diagnosed in 2000/01 having an unknown NPI compared with 54% diagnosed in 1992/93.
- The 5 year relative survival for invasive cancers in 2000/01 was 96.4% (95% CI 95.7%-97.0%). Women with non-invasive breast cancer had a 5 year relative survival higher than 100%, indicating that their chance of survival was no worse than that of the general UK female population.
- 5 year relative survival was significantly lower for the 1% of invasive cancers with diameter greater than 50mm, for the 17% of invasive cancers which were Grade III and for the 23% of cancers which were node positive.
- 5 year relative survival in women with <10mm diameter cancers was no worse than that of the general UK population. 5 year relative survival in women with node negative cancer was 99.0% (95% CI 98.3%-99.6%).
- Women with cancers in the NPI moderate prognosis group 2 and poor prognostic group (MPG2 and PPG) have significantly lower survival rates at 3 and 5 years than those with cancers in the excellent, good and moderate prognostic group 1 (EPG, GPG and MPG1).

ABS AT BASO AUDIT OF SCREEN DETECTED BREAST CANCERS FOR THE YEAR OF SCREENING 1 APRIL 2005 - 31 MARCH 2006

AUDIT TIMETABLE	
Date	**Event**
15 June 06	Audit steering group meet to plan the 2005/06 audit.
27 June 06	Draft timetable and changes in the audit emailed to Audit Group and QA Reference Centres (QARCs) for comments. Let Cancer Registries know that the survival audit is going to be the same as last year.
27 June -7 July 06	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 10 July.
20 July 06	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 2005/06.
21 Aug 06	Deadline for QARCs to request survival audit data from Cancer Registries.
25 Sept 06	Deadline for Cancer Registries to provide data to the QARCs for the survival audit.
4 Oct 06	Audit to be discussed at the ABS at BASO Surgical National Committee meeting.
16 Oct 06	**Deadline for receipt of survival data from QARCs at the WMCIU.**
17 - 28 Oct 06	All QARCs to ensure that an appropriate member of staff is available to respond to any queries from the WMCIU regarding the survival audit.
20 Oct 06	**Deadline for nodal information audit**
6 Nov 06	**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.**
13 Nov 06	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.*
22 Nov -2 Dec 06	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.
5 Dec - 6 Jan 06	QARCs make final adjustments to the audit spreadsheets.
8 Jan 07	**Deadline for receipt of main and adjuvant audit data from QARCs at the WMCIU.**
9 -19 Jan 07	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.
28 Feb 07	Draft tables sent out to Audit Group for comment.
12 March 07	Draft Audit booklet to be taken to the ABS at BASO Screening Representatives meeting, and emailed to QA Reference Centres for information. *All draft data should be marked "Not for circulation" to avoid unpublished data getting into the public domain.*
2 April 07	**Deadline for commissioned audits abstract to Lucy Davies**
2 April 07	Audit booklet final draft sent to the Audit Group to act as scrutinisers/editors.
17 April 07	Audit group and speakers pre-conference meeting
18 April 07	Deadline for receipt of the audit booklet at the printers.
30 April - 4 May 07	Advance copies of booklet to be sent to Audit Group and commentator of the BASO conference, Nottingham.
23 May 07	**Audit booklet distributed at the 2007 ABS at BASO Conference, Motorcycle Museum Birmingham.**

ABS AT BASO AUDIT OF 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 - 31ST MARCH 2006 INCLUSIVE ACCORDING TO THE REGIONAL BOUNDARIES EXTANT FROM 1ST APRIL 2006

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

It is the responsibility of the QA co-ordinator to organise collection at unit level, on paper and/or using copies of the spreadsheet. Regional data should be sent to the West Midlands Cancer Intelligence Unit (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.**

Each unit should be identified with a distinct code such as "Unit 1", "Unit 2" etc. Data will be presented by region and unit (with only the region identified). Each surgeon should be identified by their GMC code in order to audit screening caseload accurately. The unique identifying number known as the "Sx" number is required for data validation and matching purposes.

The deadline for submission of regional data by the regional QA Co-ordinator to the WMCIU is 8th January 2007

****

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 ABS at BASO breast audit should be counted in the same way so that the total number of cancers in the ABS at BASO breast audit equals the total number of cancers counted on the KC62 report for 2005/06. 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.

Pre-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. The more familiar term "pre-operative" is retained for this audit rather than "non-operative" even though not all cancers with C5/B5 undergo surgery.

Malignant diagnostic open biopsies: Cancers diagnosed by neither C5 nor B5 will have had a diagnostic open biopsy with outcome of cancer. These cancers appear in KC62 C24 L24, which includes some cancers with 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: A cancer with no surgery has the invasive status taken from the core biopsy (B5A non-invasive, B5B invasive).

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 2005/06. 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 intended to carry 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 West Midlands Cancer Intelligence Unit. A woman with screen detected breast cancer who did not have a pre-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 (LCIS): All women with non-invasive cancer, including those with LCIS, should be included in Part C of the audit. It is accepted that for LCIS the grade 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

Regional QA co-ordinator should work with screen 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 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
qarc@wmciu.nhs.uk

ABS AT BASO BREAST AUDIT 2005/06

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 2005/06 with C5 cytology but benign histology (ie. cytology false positive) (CQA report)	Number of clients in 2005/06 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 surgical referral). 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. K - 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. L - 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. M - Immediate Reconstruction - to be completed by the surgeon for mastectomies only. Enter X if type of treatment not M.
Col. N - Invasive status refers to Non Invasive, Micro Invasive and Invasive in the crystal report. The worse invasive status of all should be recorded here. For example, DCIS with invasive component should be recorded as ‘I’. If a patient has two cancers (invasive and non-invasive), input details for the invasive cancer. (I=Invasive, M=Micro-invasive, N=Non-invasive, U=Unknown)

-Sx Number- *{C}* **Sx Number**	*-Surgeon-* *{D}* **Consultant GMC Code**	*-DOB-* *{E}* **Date of birth** *(dd/mm/yyyy*	*-DOFOA-* *{F}* **Date of first offered appt** *(dd/mm/yyyy)*	*-Screen Date-* *{G}* **Screen date** *(dd/mm/yyyy , EC,U)*	*-Ass Date-* *{H}* **First assessment date** *(dd/mm/yyyy, U)*	*-WBN Opinon-* *{I}* **Worst cytology** *(see above)*	*-WBN Opinion + Type-* *{J}* **Worst core biopsy** *(see above)*	*{K}* **Number of visits for cytology/core biopsy** *(exclude results clinic)* *(U,0,1,2,.)*	*{L}* **Type of treat-ment** *(C,M,NS,U)*	*-treatment-* *{M}* **Immediate recon-struction** *(only for M =Mastectomy)* *(Y,N,U,X)*	*{N}* **Invasive status** *(I,N,M,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- {o}* **First surgery date** *(diag or therapeutic)* *(dd/mm/yyyy,NS,U)*	*-Biopsy Date- {P}* **Final surgery date** *(excl reconstruction only)* *(dd/mm/yyyy,NS,U)*	*-Treatment + No des- {Q}* **First operation type** *(diag or therapeutic)* *(C,M,AX, C+AX,M+AX, NS,U)*	*-Treatment + No des- {R}* **Second operation type** *(C,M,AX, C+AX,M+AX, NS,U)*	*-Treatment + No des- {S}* **Third operation type** *(C,M,AX, C+AX,M+AX, NS,U)*	*-Treatment + No des- {T}* **Fourth operation type** *(C,M,AX, C+AX,M+AX, NS,U)*	*-Treatment + No des- {U}* **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-{V}* **Total nodes obtained** *(NS,U, 0,1,2,..)*	*-Pos Nod-{W}* **Number nodes positive** *(NS,U, 0,1,2,..)*	*-Total Node-{X}* **Total nodes obtained** *(NS,U, 0,1,2,..)*	*-Pos Nod-{Y}* **Number nodes positive** *(NS,U, 0,1,2,..)*	*-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,..)*	*{AF}* **Any Sentinel Procedure** *(Y/N/U)*

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

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

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

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

Col. AN - Grade (H = High grade, O = Other grade, NA = Not assessable, U = Unknown)
Col. AO - Pathological size (enter size in millimetres, NA = Not assessable, U = Unknown)

{C} **Sx Number**	*-Non Invasive-* *{AN}* **Grade** (H,O,NA,U)	*-Whole Size-* *{AO}* **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 caseload > 30 per year	**Joined NHSBSP 2005/06**	**Left NHSBSP 2005/06**	**Surgeon operated on patient request**	**Surgeon is a plastic surgeon**	**Surgeon operated in private practice**	**Not screening in area 2005/06**	**No information available for surgeon**	**Other reason (text)**
NoRef											

ABS AT BASO ADJUVANT AUDIT FOR WOMEN WITH SCREEN DETECTED BREAST CANCERS DETECTED BETWEEN 1ST APRIL 2004 AND 31ST MARCH 2005

PLEASE SUPPLY DATA FOR WOMEN OF ALL AGES WITH SCREEN DETECTED BREAST CANCERS WITH FIRST OFFERED APPOINTMENT FROM 1ST APRIL 2004 TO 31ST MARCH 2005 INCLUSIVE ACCORDING TO THE REGIONAL BOUNDARIES EXTANT FROM 1ST APRIL 2006

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

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

Data will be presented by region and unit (with only the region identified). The unique identifying number known as the "Sx" number is required for data validation and matching purposes. **Names 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 8th January 2007

DEFINITIONS AND GUIDANCE NOTES

Audit cut-off date: If a woman has not received radiotherapy or chemotherapy or hormonal therapy before 31st March 2006 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 BASO breast audit should be counted in the same way so that the number of cancers in the BASO breast audit equals the number counted on the KC62 report. If bilateral or multiple cancers have been detected the KC62 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 cohort of cases required for the adjuvant audit is the same as the most recent ABS at BASO 2004/05 main audit presented on 14th June 2006 (14,040 UK NHSBSP cancers in total). To aid data collection, coded identifiers and screening dates already collected in the 2004/05 main audit have been prefilled in the regional data collection spreadsheets. The adjuvant data collected in this audit will be matched by the WMCIU to previously collected tumour data by linking on the unique identifier "UniqueMain" assigned by the WMCIU and given in the data collection spreadsheet. The WMCIU must be advised of any changes in the region or anonymous 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 2004 TO 31ST MARCH 2005 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 2004 TO 31ST MARCH 2005 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 31/03/06, N = No therapy given before 31/03/06, 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)*

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

ABS AT BASO SURVIVAL AUDIT FOR WOMEN WITH SCREEN DETECTED BREAST CANCERS DETECTED BETWEEN 1ST APRIL 2000 AND 31ST MARCH 2001

The completed spreadsheets should be submitted by the Breast Screening QA Reference Centre to the WMCIU by 16th October 2006. 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 1st April 2000 and 31st March 2001 with data recorded by regional cancer registries to enable analysis of breast cancer survival for a period of up to 5 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 1st April 2000 and 31st March 2001 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 31st March 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 2000/01 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.

All requests for data should be submitted to the Cancer Registry by 21st August 2006

The following data items are required from the cancer registry for all breast tumours screen detected between 1st April 2000 and 31st March 2001.

- 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 (leave blank 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 **31st March 2006**. The cancer registry should confirm to the QA Reference Centre that death data are complete to 31st March 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:

Ms Shan Cheung
Breast Screening QA Information Officer
West Midlands Cancer Intelligence Unit
Public Health Building
The University of Birmingham
Birmingham
B15 2TT

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shan.cheung@wmciu.nhs.uk
qarc@wmciu.nhs.uk

SURVIVAL AUDIT: SCREENING OFFICE DATA FOR CASES DETECTED IN 2000/01

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 2000/01

Region:
Screening Unit:
Cancer Registry: **Data complete to: 31/03/2006 (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 ABS at BASO Survival audit is only concerned with details of screen detected breast cancers diagnosed in 2000/01. If when cases are matched, the diagnosis date recorded at the Cancer Registry is outside the audit period (2000/01), it may mean that the breast cancer the BASO audit is examining is not registered (NR) at the Cancer Registry.

Remember- The ABS at BASO Survival audit is only concerned with details of screen-detected primary breast cancers which were diagnosed between 1st April 2000 – 31st March 2001.

When matching cases it is important that the breast cancer occurrence (the occurrence in 2000/01) 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 2000/01 (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 2000/01 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 QARC. 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

APPENDIX E

DATA FROM THE 2005/06 AUDIT OF SCREEN DETECTED BREAST CANCERS IN WOMEN ALL AGES FOR THE PERIOD 1 APRIL 2005 – 31 MARCH 2006

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
	No.	%	No.	%	No.	%	No.	%	No.	%			
N East, Yorks & Humber	1643	78	27	1	427	20	5	0	2102	100	258471	1.8	6.4
East Midlands	1020	80	10	1	238	19	5	0	1273	100	149060	1.7	6.8
East of England	1205	79	10	1	306	20	0	0	1521	100	178909	1.8	6.7
London	1132	77	13	1	325	22	2	0	1472	100	198791	1.7	5.7
South East Coast	1028	79	12	1	257	20	3	0	1300	100	149114	1.8	6.9
South Central	950	81	9	1	218	19	0	0	1177	100	137057	1.7	6.9
South West	1232	77	0	0	360	23	6	0	1598	100	185657	1.9	6.6
West Midlands	1140	81	15	1	245	17	1	0	1401	100	177411	1.5	6.4
North West	1330	79	33	2	307	18	5	0	1675	100	209303	1.6	6.4
Wales	658	78	8	1	176	21	0	0	842	100	99458	1.9	6.6
Northern Ireland	187	81	5	2	40	17	0	0	232	100	33149	1.4	5.6
Scotland	1075	80	16	1	260	19	0	0	1351	100	166069	1.7	6.5
United Kingdom	**12600**	**79**	**158**	**1**	**3159**	**20**	**27**	**0**	**15944**	**100**	**1942449**	**1.7**	**6.5**

Table 2 : Age at first offered appointment

Region	<50		50-64		65-70		>70		Total	>65	
	No.	%	No.	%	No.	%	No.	%		No.	%
N East, Yorks & Humber	28	1	1385	66	617	29	72	3	2102	689	33
East Midlands	21	2	856	67	330	26	66	5	1273	396	31
East of England	11	1	1013	67	385	25	112	7	1521	497	33
London	31	2	966	66	398	27	77	5	1472	475	32
South East Coast	25	2	843	65	344	26	88	7	1300	432	33
South Central	20	2	756	64	343	29	58	5	1177	401	34
South West	15	1	992	62	476	30	115	7	1598	591	37
West Midlands	30	2	925	66	395	28	51	4	1401	446	32
North West	28	2	1085	65	478	29	84	5	1675	562	34
Wales	14	2	637	76	131	16	60	7	842	191	23
Northern Ireland	0	0	219	94	12	5	1	0	232	13	6
Scotland	0	0	853	63	404	30	94	7	1351	498	37
United Kingdom	**223**	**1**	**10530**	**66**	**4313**	**27**	**878**	**6**	**15944**	**5191**	**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	2102	1	0.05
East Midlands	1273	1	0.08
East of England	1521	0	0.00
London	1472	0	0.00
South East Coast	1300	1	0.08
South Central	1177	0	0.00
South West	1598	1	0.06
West Midlands	1401	0	0.00
North West	1675	0	0.00
Wales	842	1	0.12
Northern Ireland	232	0	0.00
Scotland	1351	1	0.07
United Kingdom	**15944**	**6**	**0.04**

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	2102	180	9	207	10	1599	76	1986	94	116	6
East Midlands	1273	4	0	22	2	1187	93	1213	95	60	5
East of England	1521	31	2	38	2	1344	88	1413	93	108	7
London	1472	58	4	72	5	1237	84	1367	93	105	7
South East Coast	1300	139	11	48	4	1044	80	1231	95	69	5
South Central	1177	46	4	79	7	956	81	1081	92	96	8
South West	1598	54	3	32	2	1417	89	1503	94	95	6
West Midlands	1401	74	5	6	0	1251	89	1331	95	70	5
North West	1675	194	12	50	3	1321	79	1565	93	110	7
Wales	842	1	0	10	1	792	94	803	95	39	5
Northern Ireland	232	78	34	66	28	76	33	220	95	12	5
Scotland	1351	13	1	298	22	976	72	1287	95	64	5
United Kingdom	**15944**	**872**	**5**	**928**	**6**	**13200**	**83**	**15000**	**94**	**944**	**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	1643	173	11	184	11	1254	76	1611	98	32	2
East Midlands	1020	4	0	21	2	976	96	1001	98	19	2
East of England	1205	30	2	38	3	1096	91	1164	97	41	3
London	1132	53	5	70	6	973	86	1096	97	36	3
South East Coast	1028	133	13	46	4	823	80	1002	97	26	3
South Central	950	45	5	77	8	787	83	909	96	41	4
South West	1232	51	4	31	3	1120	91	1202	98	30	2
West Midlands	1140	72	6	6	1	1039	91	1117	98	23	2
North West	1330	190	14	48	4	1060	80	1298	98	32	2
Wales	658	1	0	9	1	630	96	640	97	18	3
Northern Ireland	187	75	40	59	32	46	25	180	96	7	4
Scotland	1075	7	1	282	26	764	71	1053	98	22	2
United Kingdom	**12600**	**834**	**7**	**871**	**7**	**10568**	**84**	**12273**	**97**	**327**	**3**

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	427	4	1	18	4	325	76	347	81	80	19
East Midlands	238	0	0	1	0	198	83	199	84	39	16
East of England	306	1	0	0	0	240	78	241	79	65	21
London	325	5	2	2	1	251	77	258	79	67	21
South East Coast	257	3	1	2	1	209	81	214	83	43	17
South Central	218	1	0	2	1	160	73	163	75	55	25
South West	360	2	1	1	0	295	82	298	83	62	17
West Midlands	245	1	0	0	0	199	81	200	82	45	18
North West	307	3	1	2	1	228	74	233	76	74	24
Wales	176	0	0	1	1	154	88	155	88	21	12
Northern Ireland	40	3	8	5	13	27	68	35	88	5	13
Scotland	260	6	2	13	5	199	77	218	84	42	16
United Kingdom	**3159**	**29**	**1**	**47**	**1**	**2485**	**79**	**2561**	**81**	**598**	**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	1806	446	25	1310	73	50	3
East Midlands	1209	265	22	937	78	7	1
East of England	1382	261	19	1061	77	60	4
London	1309	322	25	980	75	7	1
South East Coast	1092	298	27	794	73	0	0
South Central	1035	217	21	817	79	1	0
South West	1449	380	26	1039	72	30	2
West Midlands	1257	271	22	983	78	3	0
North West	1371	287	21	1077	79	7	1
Wales	802	199	25	598	75	5	1
Northern Ireland	142	46	32	96	68	0	0
Scotland	1274	275	22	993	78	6	0
United Kingdom	**14128**	**3267**	**23**	**10685**	**76**	**176**	**1**

Table 8 : B5a (Non-invasive) core biopsy: histological invasive status after surgery								
	Invasive		Micro-invasive		Non-invasive		Total with surgery	
Region	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	99	23	21	5	320	73	440	100
East Midlands	57	22	10	4	193	74	260	100
East of England	44	17	3	1	208	82	255	100
London	77	25	11	4	219	71	307	100
South East Coast	80	27	12	4	203	69	295	100
South Central	51	24	9	4	157	72	217	100
South West	93	25	0	0	284	75	377	100
West Midlands	65	24	11	4	194	72	270	100
North West	32	11	28	10	227	79	287	100
Wales	47	24	4	2	146	74	197	100
Northern Ireland	10	22	4	9	31	69	45	100
Scotland	57	21	13	5	202	74	272	100
United Kingdom	**712**	**22**	**126**	**4**	**2384**	**74**	**3222**	**100**

Table 9 : B5b (Invasive) core biopsy: histological invasive status after surgery								
	Invasive		Micro-invasive		Non-invasive		Total with surgery	
Region	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	1285	100	0	0	0	0	1285	100
East Midlands	913	100	0	0	0	0	913	100
East of England	1030	100	2	0	3	0	1035	100
London	922	98	1	0	16	2	939	100
South East Coast	772	99	0	0	5	1	777	100
South Central	805	100	0	0	4	0	809	100
South West	1026	100	0	0	5	0	1031	100
West Midlands	962	100	0	0	3	0	965	100
North West	1063	100	1	0	2	0	1066	100
Wales	570	98	4	1	6	1	580	100
Northern Ireland	94	99	1	1	0	0	95	100
Scotland	967	99	2	0	5	1	974	100
United Kingdom	**10409**	**99**	**11**	**0**	**49**	**0**	**10469**	100

Table 10 : C5 only: histological invasive status after surgery										
	Invasive		Micro-invasive		Non-invasive		Unknown status		Total	
Region	No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	173	98	0	0	4	2	0	0	177	100
East Midlands	3	100	0	0	0	0	0	0	3	100
East of England	30	97	0	0	1	3	0	0	31	100
London	53	91	0	0	5	9	0	0	58	100
South East Coast	133	97	0	0	3	2	1	1	137	100
South Central	45	98	0	0	1	2	0	0	46	100
South West	51	96	0	0	2	4	0	0	53	100
West Midlands	72	97	0	0	1	1	1	1	74	100
North West	190	98	0	0	3	2	0	0	193	100
Wales	1	100	0	0	0	0	0	0	1	100
Northern Ireland	75	96	0	0	3	4	0	0	78	100
Scotland	7	54	0	0	6	46	0	0	13	100
United Kingdom	**833**	**96**	**0**	**0**	**29**	**3**	**2**	**0**	**864**	**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	1880	89	213	10	6	0	0	0	2102	100	219	10
East Midlands	0	0	1162	91	106	8	5	0	0	0	1273	100	111	9
East of England	4	0	1413	93	101	7	3	0	0	0	1521	100	104	7
London	10	1	1334	91	123	8	1	0	4	0	1472	100	128	9
South East Coast	1	0	1079	83	210	16	10	1	0	0	1300	100	220	17
South Central	5	0	1011	86	145	12	16	1	0	0	1177	100	161	14
South West	3	0	1435	90	149	9	9	1	2	0	1598	100	160	10
West Midlands	1	0	1287	92	107	8	6	0	0	0	1401	100	113	8
North West	0	0	1338	80	321	19	16	1	0	0	1675	100	337	20
Wales	2	0	749	89	85	10	6	1	0	0	842	100	91	11
Northern Ireland	0	0	214	92	17	7	1	0	0	0	232	100	18	8
Scotland	1	0	1263	93	84	6	3	0	0	0	1351	100	87	6
United Kingdom	**30**	**0**	**14165**	**89**	**1661**	**10**	**82**	**1**	**6**	**0**	**15944**	**100**	**1749**	**11**

Table 12 : Average number of visits					
Region	Total	Mean	Min.	Median	Max.
N East, Yorks & Humber	2102	1.1	0	1	3
East Midlands	1273	1.1	1	1	3
East of England	1521	1.1	0	1	3
London	1472	1.1	0	1	3
South East Coast	1300	1.2	0	1	3
South Central	1177	1.1	0	1	4
South West	1598	1.1	0	1	3
West Midlands	1401	1.1	0	1	3
North West	1675	1.2	1	1	3
Wales	842	1.1	0	1	4
Northern Ireland	232	1.1	1	1	3
Scotland	1351	1.1	0	1	4
United Kingdom	**15944**	**1.1**	**0**	**1**	**4**

Table 13 : All cancers versus C5 and/or B5 at first visit						
	1 C5/B5		Non-operative diagnosis rate		All cancers	
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**
N East, Yorks & Humber	1800	86	1986	94	2102	100
East Midlands	1121	88	1213	95	1273	100
East of England	1323	87	1413	93	1521	100
London	1247	85	1367	93	1472	100
South East Coast	1035	80	1231	95	1300	100
South Central	948	81	1081	92	1177	100
South West	1362	85	1503	94	1598	100
West Midlands	1238	88	1331	95	1401	100
North West	1264	75	1565	93	1675	100
Wales	718	85	803	95	842	100
Northern Ireland	205	88	220	95	232	100
Scotland	1213	90	1287	95	1351	100
United Kingdom	**13474**	**85**	**15000**	**94**	**15944**	**100**

Table 14 : 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	229	66	116	34	345	100	258471	0.89	0.45
East Midlands	125	68	60	32	185	100	149060	0.84	0.40
East of England	211	66	108	34	319	100	178909	1.18	0.60
London	180	63	105	37	285	100	198791	0.91	0.53
South East Coast	153	69	69	31	222	100	149114	1.03	0.46
South Central	155	62	96	38	251	100	137057	1.13	0.70
South West	200	68	95	32	295	100	185657	1.08	0.51
West Midlands	144	67	70	33	214	100	177411	0.81	0.39
North West	204	65	110	35	314	100	209303	0.97	0.53
Wales	81	68	39	33	120	100	99458	0.81	0.39
Northern Ireland	15	56	12	44	27	100	33149	0.45	0.36
Scotland	150	70	64	30	214	100	166069	0.90	0.39
United Kingdom	**1847**	**66**	**944**	**34**	**2791**	**100**	**1942449**	**0.95**	**0.49**

Table 15 : 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	1	0.39	2	0.77
East Midlands	0	0.00	5	3.35
East of England	1	0.56	1	0.56
London	1	0.50	4	2.01
South East Coast	0	0.00	1	0.67
South Central	0	0.00	3	2.19
South West	1	0.54	4	2.15
West Midlands	1	0.56	5	2.82
North West	1	0.48	5	2.39
Wales	0	0.00	0	0.00
Northern Ireland	0	0.00	0	0.00
Scotland	1	0.60	2	1.20
United Kingdom	**7**	**0.36**	**32**	**1.65**

Table 16 : 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	116	32	28	4	3	80	69	0	0
East Midlands	60	19	32	0	0	39	65	2	3
East of England	108	41	38	2	2	65	60	0	0
London	105	36	34	1	1	67	64	1	1
South East Coast	69	26	38	0	0	43	62	0	0
South Central	96	41	43	0	0	55	57	0	0
South West	95	30	32	0	0	62	65	3	3
West Midlands	70	23	33	2	3	45	64	0	0
North West	110	32	29	3	3	74	67	1	1
Wales	39	18	46	0	0	21	54	0	0
Northern Ireland	12	7	58	0	0	5	42	0	0
Scotland	64	22	34	0	0	42	66	0	0
United Kingdom	**944**	**327**	**35**	**12**	**1**	**598**	**63**	**7**	**1**

Table 17 : 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	32	1	3	0	0	24	75	7	22
East Midlands	19	0	0	0	0	17	89	2	11
East of England	41	3	7	6	15	29	71	3	7
London	36	5	14	6	17	22	61	3	8
South East Coast	26	1	4	3	12	21	81	1	4
South Central	41	4	10	2	5	30	73	5	12
South West	30	2	7	7	23	16	53	5	17
West Midlands	23	0	0	5	22	17	74	1	4
North West	32	1	3	5	16	21	66	5	16
Wales	18	2	11	0	0	16	89	0	0
Northern Ireland	7	0	0	0	0	2	29	5	71
Scotland	22	0	0	1	5	15	68	6	27
United Kingdom	**327**	**19**	**6**	**35**	**11**	**230**	**70**	**43**	**13**

Table 18 : 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	80	1	1	0	0	69	86	10	13
East Midlands	39	0	0	0	0	38	97	1	3
East of England	65	1	2	0	0	63	97	1	2
London	67	5	7	3	4	52	78	7	10
South East Coast	43	0	0	1	2	38	88	4	9
South Central	55	1	2	0	0	53	96	1	2
South West	62	1	2	0	0	56	90	5	8
West Midlands	45	1	2	0	0	43	96	1	2
North West	74	0	0	3	4	67	91	4	5
Wales	21	0	0	0	0	20	95	1	5
Northern Ireland	5	0	0	0	0	2	40	3	60
Scotland	42	1	2	0	0	36	86	5	12
United Kingdom	**598**	**11**	**2**	**7**	**1**	**537**	**90**	**43**	**7**

Table 19 : 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	32	1	3	19	59	7	22	2	6	3	9
East Midlands	19	0	0	6	32	12	63	1	5	0	0
East of England	41	3	7	26	63	4	10	3	7	5	12
London	36	5	14	10	28	10	28	7	19	4	11
South East Coast	26	1	4	14	54	5	19	4	15	2	8
South Central	41	4	10	14	34	14	34	5	12	4	10
South West	30	2	7	10	33	14	47	2	7	2	7
West Midlands	23	0	0	13	57	5	22	2	9	3	13
North West	32	1	3	11	34	15	47	2	6	3	9
Wales	18	2	11	6	33	8	44	0	0	2	11
Northern Ireland	7	0	0	2	29	3	43	1	14	1	14
Scotland	22	0	0	3	14	14	64	2	9	3	14
United Kingdom	**327**	**19**	**6**	**134**	**41**	**111**	**34**	**31**	**9**	**32**	**10**

Table 20 : 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	80	1	1	27	34	49	61	1	1	2	3
East Midlands	39	0	0	17	44	21	54	0	0	1	3
East of England	65	1	2	26	40	31	48	1	2	6	9
London	67	5	7	15	22	42	63	4	6	1	1
South East Coast	43	0	0	10	23	32	74	1	2	0	0
South Central	55	1	2	18	33	31	56	1	2	4	7
South West	62	1	2	30	48	26	42	5	8	0	0
West Midlands	45	1	2	15	33	26	58	1	2	2	4
North West	74	0	0	32	43	39	53	2	3	1	1
Wales	21	0	0	6	29	12	57	3	14	0	0
Northern Ireland	5	0	0	2	40	3	60	0	0	0	0
Scotland	42	1	2	13	31	26	62	2	5	0	0
United Kingdom	**598**	**11**	**2**	**211**	**35**	**338**	**57**	**21**	**4**	**17**	**3**

Table 21 : 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	288	63	160	35	6	1	0	0	454	100
East Midlands	147	59	96	39	5	2	0	0	248	100
East of England	217	69	93	29	6	2	0	0	316	100
London	230	68	91	27	7	2	10	3	338	100
South East Coast	195	72	71	26	3	1	0	0	269	100
South Central	161	71	66	29	0	0	0	0	227	100
South West	278	77	79	22	3	1	0	0	360	100
West Midlands	168	65	91	35	1	0	0	0	260	100
North West	228	67	112	33	0	0	0	0	340	100
Wales	121	66	61	33	2	1	0	0	184	100
Northern Ireland	31	69	13	29	1	2	0	0	45	100
Scotland	196	71	77	28	3	1	0	0	276	100
United Kingdom	**2260**	**68**	**1010**	**30**	**37**	**1**	**10**	**0**	**3317**	**100**

Table 22 : Cytonuclear grade of surgically treated non-invasive cancers										
	High		Other		Not assessable		Unknown		Total with surgery	
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
N East, Yorks & Humber	224	53	173	41	14	3	10	2	421	100
East Midlands	150	64	76	33	4	2	3	1	233	100
East of England	154	51	135	45	8	3	3	1	300	100
London	163	51	128	40	5	2	22	7	318	100
South East Coast	139	55	103	41	6	2	6	2	254	100
South Central	139	64	72	33	0	0	7	3	218	100
South West	197	55	137	38	11	3	12	3	357	100
West Midlands	160	66	82	34	0	0	2	1	244	100
North West	162	53	137	45	2	1	6	2	307	100
Wales	94	54	70	40	9	5	1	1	174	100
Northern Ireland	20	51	16	41	0	0	3	8	39	100
Scotland	166	65	77	30	1	0	13	5	257	100
United Kingdom	**1768**	**57**	**1206**	**39**	**60**	**2**	**88**	**3**	**3122**	**100**

Table 23 : Size of non-invasive cancers												
	<15mm		15-<30mm		30+ mm		Size not assessable		Size unknown		Total non-invasive	
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
N East, Yorks & Humber	169	40	114	27	106	25	0	0	38	9	427	100
East Midlands	98	41	73	31	54	23	5	2	8	3	238	100
East of England	118	39	93	30	57	19	18	6	20	7	306	100
London	136	42	90	28	48	15	3	1	48	15	325	100
South East Coast	106	41	73	28	56	22	5	2	17	7	257	100
South Central	86	39	62	28	53	24	4	2	13	6	218	100
South West	170	47	80	22	66	18	21	6	23	6	360	100
West Midlands	115	47	62	25	58	24	2	1	8	3	245	100
North West	109	36	96	31	64	21	7	2	31	10	307	100
Wales	63	36	39	22	33	19	11	6	30	17	176	100
Northern Ireland	17	43	11	28	6	15	0	0	6	15	40	100
Scotland	100	38	86	33	62	24	0	0	12	5	260	100
United Kingdom	**1287**	**41**	**879**	**28**	**663**	**21**	**76**	**2**	**254**	**8**	**3159**	**100**

Table 24: 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	10	2	32	8	33	8	421
East Midlands	3	1	3	1	3	1	233
East of England	3	1	14	5	16	5	300
London	22	7	41	13	43	14	318
South East Coast	6	2	14	6	15	6	254
South Central	7	3	13	6	15	7	218
South West	12	3	20	6	22	6	357
West Midlands	2	1	7	3	9	4	244
North West	6	2	31	10	31	10	307
Wales	1	1	28	16	28	16	174
Northern Ireland	3	8	5	13	5	13	39
Scotland	13	5	9	4	18	7	257
United Kingdom	**88**	**3**	**217**	**7**	**238**	**8**	**3122**

Table 25 : Treatment of non-invasive cases with high cytonuclear grade and unknown size								
	Conservation surgery		Mastectomy		Unknown		Total	
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
N East, Yorks & Humber	5	83	1	17	0	0	6	100
East Midlands	0	-	0	-	0	-	0	-
East of England	3	75	1	25	0	0	4	100
London	2	50	2	50	0	0	4	100
South East Coast	4	80	1	20	0	0	5	100
South Central	2	40	3	60	0	0	5	100
South West	4	100	0	0	0	0	4	100
West Midlands	2	100	0	0	0	0	2	100
North West	6	46	7	54	0	0	13	100
Wales	5	50	5	50	0	0	10	100
Northern Ireland	2	100	0	0	0	0	2	100
Scotland	3	100	0	0	0	0	3	100
United Kingdom	**38**	**66**	**20**	**34**	**0**	**0**	**58**	100

Table 26 : Treatment of non-invasive cancers with unknown cytonuclear grade and unknown size										
	Conservation surgery		Mastectomy		Unknown treatment		No surgery		Total	
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
N East, Yorks & Humber	7	47	2	13	0	0	6	40	15	100
East Midlands	3	38	0	0	0	0	5	63	8	100
East of England	1	14	0	0	0	0	6	86	7	100
London	13	48	2	7	5	19	7	26	27	100
South East Coast	5	63	0	0	0	0	3	38	8	100
South Central	5	100	0	0	0	0	0	0	5	100
South West	9	69	1	8	0	0	3	23	13	100
West Midlands	0	0	0	0	0	0	1	100	1	100
North West	3	50	3	50	0	0	0	0	6	100
Wales	1	33	0	0	0	0	2	67	3	100
Northern Ireland	3	75	0	0	0	0	1	25	4	100
Scotland	4	57	0	0	0	0	3	43	7	100
United Kingdom	**54**	**52**	**8**	**8**	**5**	**5**	**37**	**36**	**104**	**100**

Table 27 : Treatment of high cytonuclear grade non-invasive cancers (30+mm)								
	Conservation surgery		Mastectomy		Unknown		Total	
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
N East, Yorks & Humber	20	27	54	73	0	0	74	100
East Midlands	12	29	29	71	0	0	41	100
East of England	11	28	28	72	0	0	39	100
London	14	44	18	56	0	0	32	100
South East Coast	16	36	29	64	0	0	45	100
South Central	12	31	27	69	0	0	39	100
South West	18	40	27	60	0	0	45	100
West Midlands	15	31	33	69	0	0	48	100
North West	10	26	28	74	0	0	38	100
Wales	7	25	21	75	0	0	28	100
Northern Ireland	0	0	4	100	0	0	4	100
Scotland	13	27	35	73	0	0	48	100
United Kingdom	**148**	**31**	**333**	**69**	**0**	**0**	**481**	**100**

Table 28 : Treatment for invasive breast cancers										
	Conservation surgery		Mastectomy		Unknown		No Surgery		Total	
Region	No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	1092	66	526	32	0	0	25	2	1643	100
East Midlands	682	67	313	31	0	0	25	2	1020	100
East of England	894	74	285	24	1	0	25	2	1205	100
London	807	71	284	25	14	1	27	2	1132	100
South East Coast	777	76	234	23	0	0	17	2	1028	100
South Central	699	74	243	26	0	0	8	1	950	100
South West	946	77	278	23	0	0	8	1	1232	100
West Midlands	858	75	264	23	0	0	18	2	1140	100
North West	949	71	370	28	0	0	11	1	1330	100
Wales	446	68	194	29	0	0	18	3	658	100
Northern Ireland	147	79	39	21	0	0	1	1	187	100
Scotland	759	71	297	28	1	0	18	2	1075	100
United Kingdom	**9056**	**72**	**3327**	**26**	**16**	**0**	**201**	**2**	**12600**	100

Table 29 : 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	411	25	446	27	329	20	395	24	24	1	38	2	1643	100
East Midlands	281	28	290	28	204	20	198	19	9	1	38	4	1020	100
East of England	309	26	365	30	221	18	255	21	19	2	36	3	1205	100
London	266	23	272	24	233	21	294	26	9	1	58	5	1132	100
South East Coast	259	25	305	30	189	18	232	23	23	2	20	2	1028	100
South Central	224	24	275	29	169	18	253	27	20	2	9	1	950	100
South West	339	28	339	28	244	20	282	23	18	1	10	1	1232	100
West Midlands	259	23	315	28	241	21	281	25	20	2	24	2	1140	100
North West	323	24	373	28	251	19	341	26	24	2	18	1	1330	100
Wales	174	26	195	30	120	18	136	21	14	2	19	3	658	100
Northern Ireland	55	29	54	29	24	13	46	25	4	2	4	2	187	100
Scotland	261	24	288	27	214	20	277	26	14	1	21	2	1075	100
United Kingdom	**3161**	**25**	**3517**	**28**	**2439**	**19**	**2990**	**24**	**198**	**2**	**295**	**2**	**12600**	**100**

Table 30 : Treatment for invasive breast cancers (invasive size <10mm)								
	Conservation surgery		Mastectomy		Unknown		Total	
Region	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	315	77	96	23	0	0	411	100
East Midlands	216	77	65	23	0	0	281	100
East of England	256	83	53	17	0	0	309	100
London	207	78	59	22	0	0	266	100
South East Coast	210	81	49	19	0	0	259	100
South Central	175	78	49	22	0	0	224	100
South West	282	83	57	17	0	0	339	100
West Midlands	224	86	35	14	0	0	259	100
North West	262	81	61	19	0	0	323	100
Wales	139	80	35	20	0	0	174	100
Northern Ireland	49	89	6	11	0	0	55	100
Scotland	215	82	46	18	0	0	261	100
United Kingdom	**2550**	**81**	**611**	**19**	**0**	**0**	**3161**	**100**

Table 31 : Treatment for invasive breast cancers (invasive size 10-<15mm)								
	Conservation surgery		Mastectomy		Unknown		Total	
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
N East, Yorks & Humber	334	75	112	25	0	0	446	100
East Midlands	227	78	63	22	0	0	290	100
East of England	306	84	59	16	0	0	365	100
London	221	81	51	19	0	0	272	100
South East Coast	266	87	39	13	0	0	305	100
South Central	231	84	44	16	0	0	275	100
South West	286	84	53	16	0	0	339	100
West Midlands	265	84	50	16	0	0	315	100
North West	308	83	65	17	0	0	373	100
Wales	161	83	34	17	0	0	195	100
Northern Ireland	46	85	8	15	0	0	54	100
Scotland	223	77	65	23	0	0	288	100
United Kingdom	**2874**	**82**	**643**	**18**	**0**	**0**	**3517**	**100**

Table 32 : Treatment for invasive breast cancers (invasive size <15mm)								
	Conservation surgery		Mastectomy		Unknown		Total	
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
N East, Yorks & Humber	649	76	208	24	0	0	857	100
East Midlands	443	78	128	22	0	0	571	100
East of England	562	83	112	17	0	0	674	100
London	428	80	110	20	0	0	538	100
South East Coast	476	84	88	16	0	0	564	100
South Central	406	81	93	19	0	0	499	100
South West	568	84	110	16	0	0	678	100
West Midlands	489	85	85	15	0	0	574	100
North West	570	82	126	18	0	0	696	100
Wales	300	81	69	19	0	0	369	100
Northern Ireland	95	87	14	13	0	0	109	100
Scotland	438	80	111	20	0	0	549	100
United Kingdom	**5424**	**81**	**1254**	**19**	**0**	**0**	**6678**	**100**

Table 33 : Treatment for invasive breast cancers (invasive size 15-<20mm)								
	Conservation surgery		Mastectomy		Unknown		Total	
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
N East, Yorks & Humber	229	70	100	30	0	0	329	100
East Midlands	141	69	63	31	0	0	204	100
East of England	179	81	42	19	0	0	221	100
London	172	74	61	26	0	0	233	100
South East Coast	143	76	46	24	0	0	189	100
South Central	136	80	33	20	0	0	169	100
South West	196	80	48	20	0	0	244	100
West Midlands	196	81	45	19	0	0	241	100
North West	193	77	58	23	0	0	251	100
Wales	75	63	45	38	0	0	120	100
Northern Ireland	23	96	1	4	0	0	24	100
Scotland	168	79	46	21	0	0	214	100
United Kingdom	**1851**	**76**	**588**	**24**	**0**	**0**	**2439**	**100**

Table 34 : Treatment for invasive breast cancers (invasive size 20-<50mm)								
	Conservation surgery		Mastectomy		Unknown		Total	
Region	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	203	51	192	49	0	0	395	100
East Midlands	88	44	110	56	0	0	198	100
East of England	143	56	112	44	0	0	255	100
London	189	64	105	36	0	0	294	100
South East Coast	150	65	82	35	0	0	232	100
South Central	153	60	100	40	0	0	253	100
South West	174	62	108	38	0	0	282	100
West Midlands	167	59	114	41	0	0	281	100
North West	180	53	161	47	0	0	341	100
Wales	68	50	68	50	0	0	136	100
Northern Ireland	28	61	18	39	0	0	46	100
Scotland	150	54	127	46	0	0	277	100
United Kingdom	**1693**	**57**	**1297**	**43**	**0**	**0**	**2990**	**100**

Table 35 : Treatment for invasive breast cancers (invasive size 50+mm)								
	Conservation surgery		Mastectomy		Unknown		Total	
Region	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	2	8	22	92	0	0	24	100
East Midlands	2	22	7	78	0	0	9	100
East of England	4	21	15	79	0	0	19	100
London	4	44	5	56	0	0	9	100
South East Coast	6	26	17	74	0	0	23	100
South Central	3	15	17	85	0	0	20	100
South West	6	33	12	67	0	0	18	100
West Midlands	3	15	17	85	0	0	20	100
North West	2	8	22	92	0	0	24	100
Wales	2	14	12	86	0	0	14	100
Northern Ireland	0	0	4	100	0	0	4	100
Scotland	1	7	13	93	0	0	14	100
United Kingdom	**35**	**18**	**163**	**82**	**0**	**0**	**198**	**100**

Table 36 : 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	241	15	356	22	327	20	536	33	67	4	116	7	1643	100
East Midlands	182	18	261	26	204	20	301	30	34	3	38	4	1020	100
East of England	192	16	337	28	247	20	344	29	38	3	47	4	1205	100
London	148	13	207	18	204	18	372	33	27	2	174	15	1132	100
South East Coast	127	12	234	23	205	20	313	30	47	5	102	10	1028	100
South Central	109	11	180	19	136	14	265	28	38	4	222	23	950	100
South West	226	18	293	24	258	21	403	33	42	3	10	1	1232	100
West Midlands	154	14	270	24	273	24	374	33	45	4	24	2	1140	100
North West	222	17	359	27	260	20	426	32	42	3	21	2	1330	100
Wales	137	21	174	26	125	19	165	25	38	6	19	3	658	100
Northern Ireland	34	18	51	27	33	18	60	32	5	3	4	2	187	100
Scotland	177	16	260	24	218	20	359	33	37	3	24	2	1075	100
United Kingdom	**1949**	**15**	**2982**	**24**	**2490**	**20**	**3918**	**31**	**460**	**4**	**801**	**6**	**12600**	**100**

Table 37 : 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	597	70	80	9	109	13	23	3	48	6	857	100
East Midlands	443	78	50	9	66	12	12	2	0	0	571	100
East of England	528	78	55	8	73	11	7	1	11	2	674	100
London	355	66	48	9	64	12	13	2	58	11	538	100
South East Coast	361	64	65	12	71	13	17	3	50	9	564	100
South Central	289	58	36	7	55	11	16	3	103	21	499	100
South West	519	77	64	9	82	12	13	2	0	0	678	100
West Midlands	424	74	69	12	69	12	11	2	1	0	574	100
North West	581	83	53	8	57	8	4	1	1	0	696	100
Wales	311	84	27	7	19	5	12	3	0	0	369	100
Northern Ireland	85	78	13	12	11	10	0	0	0	0	109	100
Scotland	437	80	43	8	51	9	15	3	3	1	549	100
United Kingdom	**4930**	**74**	**603**	**9**	**727**	**11**	**143**	**2**	**275**	**4**	**6678**	**100**

Table 38 : Treatment for invasive breast cancers <15mm with whole size <15mm								
	Conservation surgery		Mastectomy		Unknown		Total	
Region	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	490	82	107	18	0	0	597	100
East Midlands	371	84	72	16	0	0	443	100
East of England	458	87	70	13	0	0	528	100
London	304	86	51	14	0	0	355	100
South East Coast	322	89	39	11	0	0	361	100
South Central	255	88	34	12	0	0	289	100
South West	461	89	58	11	0	0	519	100
West Midlands	379	89	45	11	0	0	424	100
North West	493	85	88	15	0	0	581	100
Wales	259	83	52	17	0	0	311	100
Northern Ireland	76	89	9	11	0	0	85	100
Scotland	378	86	59	14	0	0	437	100
United Kingdom	**4246**	**86**	**684**	**14**	**0**	**0**	**4930**	**100**

Table 39 : Treatment for invasive breast cancers <15mm with whole size <15mm or whole size unknown								
	Conservation surgery		Mastectomy		Unknown		Total	
Region	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	525	81	120	19	0	0	645	100
East Midlands	371	84	72	16	0	0	443	100
East of England	466	86	73	14	0	0	539	100
London	346	84	67	16	0	0	413	100
South East Coast	368	90	43	10	0	0	411	100
South Central	338	86	54	14	0	0	392	100
South West	461	89	58	11	0	0	519	100
West Midlands	380	89	45	11	0	0	425	100
North West	494	85	88	15	0	0	582	100
Wales	259	83	52	17	0	0	311	100
Northern Ireland	76	89	9	11	0	0	85	100
Scotland	380	86	60	14	0	0	440	100
United Kingdom	**4464**	**86**	**741**	**14**	**0**	**0**	**5205**	**100**

Table 40 : Treatment for invasive breast cancers <15mm with whole size 15-<20mm								
	Conservation surgery		Mastectomy		Unknown		Total	
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
N East, Yorks & Humber	57	71	23	29	0	0	80	100
East Midlands	40	80	10	20	0	0	50	100
East of England	43	78	12	22	0	0	55	100
London	42	88	6	13	0	0	48	100
South East Coast	56	86	9	14	0	0	65	100
South Central	29	81	7	19	0	0	36	100
South West	52	81	12	19	0	0	64	100
West Midlands	58	84	11	16	0	0	69	100
North West	44	83	9	17	0	0	53	100
Wales	22	81	5	19	0	0	27	100
Northern Ireland	12	92	1	8	0	0	13	100
Scotland	38	88	5	12	0	0	43	100
United Kingdom	**493**	**82**	**110**	**18**	**0**	**0**	**603**	**100**

Table 41 : Treatment for invasive breast cancers <15mm with whole size 20-<50mm								
	Conservation surgery		Mastectomy		Unknown		Total	
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
N East, Yorks & Humber	65	60	44	40	0	0	109	100
East Midlands	32	48	34	52	0	0	66	100
East of England	51	70	22	30	0	0	73	100
London	37	58	27	42	0	0	64	100
South East Coast	51	72	20	28	0	0	71	100
South Central	37	67	18	33	0	0	55	100
South West	54	66	28	34	0	0	82	100
West Midlands	48	70	21	30	0	0	69	100
North West	31	54	26	46	0	0	57	100
Wales	14	74	5	26	0	0	19	100
Northern Ireland	7	64	4	36	0	0	11	100
Scotland	20	39	31	61	0	0	51	100
United Kingdom	**447**	**61**	**280**	**39**	**0**	**0**	**727**	**100**

Table 42 : Treatment for invasive breast cancers <15mm with whole size 50+mm								
	Conservation surgery		Mastectomy		Unknown		Total	
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
N East, Yorks & Humber	2	9	21	91	0	0	23	100
East Midlands	0	0	12	100	0	0	12	100
East of England	2	29	5	71	0	0	7	100
London	3	23	10	77	0	0	13	100
South East Coast	1	6	16	94	0	0	17	100
South Central	2	13	14	88	0	0	16	100
South West	1	8	12	92	0	0	13	100
West Midlands	3	27	8	73	0	0	11	100
North West	1	25	3	75	0	0	4	100
Wales	5	42	7	58	0	0	12	100
Northern Ireland	0	-	0	-	0	-	0	-
Scotland	0	0	15	100	0	0	15	100
United Kingdom	**20**	**14**	**123**	**86**	**0**	**0**	**143**	**100**

Table 43 : Immediate reconstruction with mastectomy (all cancers)								
	Immediate reconstruction		No immediate reconstruction		Unknown		Total mastectomies	
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
N East, Yorks & Humber	57	8	411	60	218	32	686	100
East Midlands	31	8	309	76	69	17	409	100
East of England	40	11	196	52	142	38	378	100
London	59	16	205	55	111	30	375	100
South East Coast	65	21	48	16	192	63	305	100
South Central	41	13	265	86	3	1	309	100
South West	39	11	286	80	32	9	357	100
West Midlands	44	12	310	87	1	0	355	100
North West	49	10	173	36	261	54	483	100
Wales	31	12	224	88	0	0	255	100
Northern Ireland	3	6	48	92	1	2	52	100
Scotland	40	11	333	89	1	0	374	100
United Kingdom	**499**	**12**	**2808**	**65**	**1031**	**24**	**4338**	**100**

Table 44 : Invasive status of immediate reconstruction with mastectomy								
	Invasive		Micro-invasive		Non-invasive		Total	
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
N East, Yorks & Humber	17	30	2	4	38	67	57	100
East Midlands	15	48	2	6	14	45	31	100
East of England	25	63	0	0	15	38	40	100
London	41	69	1	2	17	29	59	100
South East Coast	41	63	0	0	24	37	65	100
South Central	24	59	0	0	17	41	41	100
South West	29	74	0	0	10	26	39	100
West Midlands	22	50	1	2	21	48	44	100
North West	26	53	3	6	20	41	49	100
Wales	13	42	0	0	18	58	31	100
Northern Ireland	0	0	0	0	3	100	3	100
Scotland	21	53	2	5	17	43	40	100
United Kingdom	**274**	**55**	**11**	**2**	**214**	**43**	**499**	**100**

Table 45: 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	116	2	2	45	39	80	69	94	81	110	95	39.0
East Midlands	60	7	12	23	38	40	67	51	85	54	90	40.0
East of England	108	7	6	49	45	76	70	96	89	103	95	34.0
London*	104	6	6	37	36	66	63	93	89	100	96	36.0
South East Coast	69	0	0	8	12	30	43	55	80	66	96	50.0
South Central	96	5	5	48	50	78	81	93	97	94	98	31.5
South West	93	1	1	28	30	53	57	76	82	83	89	41.0
West Midlands	70	6	9	28	40	52	74	64	91	69	99	36.0
North West	110	10	9	47	43	81	74	98	89	106	96	34.0
Wales	39	6	15	22	56	31	79	36	92	37	95	25.0
Northern Ireland	12	0	0	7	58	9	75	12	100	12	100	28.5
Scotland	64	8	13	23	36	39	61	49	77	61	95	41.0
United Kingdom	**941***	**58**	**6**	**365**	**39**	**635**	**67**	**817**	**87**	**895**	**95**	**36.0**

**3 LCIS cases excluded (2 cases from South West and 1 from London)*

Table 46 : Waiting time - assessment 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	1951	176	9	1173	60	1740	89	1880	96	1927	99	28.0
East Midlands	1181	142	12	681	58	1020	86	1114	94	1152	98	28.0
East of England	1381	102	7	771	56	1172	85	1299	94	1353	98	29.0
London*	1312	50	4	559	43	1013	77	1186	90	1250	95	34.0
South East Coast	1209	39	3	394	33	849	70	1068	88	1157	96	37.0
South Central	1073	120	11	714	67	949	88	1024	95	1056	98	27.0
South West	1489	65	4	633	43	1171	79	1396	94	1447	97	34.0
West Midlands	1312	172	13	861	66	1155	88	1256	96	1296	99	27.0
North West	1551	259	17	963	62	1378	89	1484	96	1526	98	28.0
Wales	783	118	15	550	70	719	92	766	98	777	99	25.0
Northern Ireland	218	82	38	178	82	206	94	214	98	218	100	17.0
Scotland	1265	166	13	742	59	1049	83	1167	92	1221	97	29.0
United Kingdom	**14725**	**1491**	**10**	**8219**	**56**	**12421**	**84**	**13854**	**94**	**14380**	**98**	**29.0**

Table 47 : 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	1946	1	0	165	8	857	44	1577	81	1883	97	48.0
East Midlands	1180	1	0	113	10	494	42	903	77	1117	95	49.0
East of England	1377	0	0	67	5	304	22	712	52	1226	89	62.0
London	1309	1	0	32	2	214	16	687	52	1139	87	61.0
South East Coast	1207	0	0	34	3	218	18	671	56	1063	88	60.0
South Central	1065	3	0	244	23	651	61	934	88	1023	96	41.0
South West	1480	2	0	62	4	329	22	885	60	1378	93	58.0
West Midlands	1308	2	0	197	15	694	53	1058	81	1265	97	44.0
North West	1546	19	1	273	18	644	42	1142	74	1470	95	50.0
Wales	783	0	0	57	7	282	36	550	70	743	95	52.0
Northern Ireland	216	7	3	34	16	105	49	179	83	210	97	46.0
Scotland	1262	2	0	111	9	451	36	860	68	1158	92	52.0
United Kingdom	**14679**	**38**	**0**	**1389**	**9**	**5243**	**36**	**10158**	**69**	**13675**	**93**	**52.0**

Table 48: 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	1618	1602	99	0	0	16	1	0	0
East Midlands	995	982	99	0	0	13	1	0	0
East of England	1180	1124	95	1	0	53	4	2	0
London	1105	1016	92	0	0	73	7	16	1
South East Coast	1011	959	95	0	0	43	4	9	1
South Central	942	925	98	0	0	16	2	1	0
South West	1224	1197	98	0	0	27	2	0	0
West Midlands	1122	1111	99	0	0	11	1	0	0
North West	1319	1282	97	0	0	36	3	1	0
Wales	640	634	99	0	0	6	1	0	0
Northern Ireland	186	180	97	0	0	6	3	0	0
Scotland	1057	1051	99	0	0	5	0	1	0
United Kingdom	**12399**	**12063**	**97**	**1**	**0**	**305**	**2**	**30**	**0.2**

Table 49 : 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	158	10	1341	84	103	6	1602	100
East Midlands	106	11	543	55	332	34	981	100
East of England	519	46	606	54	4	0	1129	100
London	446	44	566	56	6	1	1018	100
South East Coast	110	11	576	60	273	28	959	100
South Central	343	37	582	63	0	0	925	100
South West	279	23	776	65	142	12	1197	100
West Midlands	273	25	834	75	4	0	1111	100
North West	274	21	405	32	603	47	1282	100
Wales	112	18	66	10	456	72	634	100
Northern Ireland	9	5	171	95	0	0	180	100
Scotland	230	22	563	54	252	24	1045	100
United Kingdom	**2859**	**24**	**7029**	**58**	**2175**	**18**	**12063**	**100**

Table 50 : Average number of nodes obtained - invasive cancers						
	Without SLNB			**With SLNB**		
Region	**Total**	**Mean**	**Median**	**Total**	**Mean**	**Median**
N East, Yorks & Humber	1444	10	9	158	5	3.0
East Midlands	876	8	6	106	6	5.0
East of England	608	10	8	519	6	4.0
London	586	13	12	446	7	5.0
South East Coast	858	9	7	110	7	5.0
South Central	583	10	9	343	6	4.0
South West	918	10	8	279	8	6.0
West Midlands	838	9	8	273	6	4.0
North West	1009	11	10	274	6	4.0
Wales	522	10	7	112	4	3.0
Northern Ireland	171	17	17	9	4	1.0
Scotland	823	9	6	229	5	4.0
United Kingdom	**9236**	**10**	**8**	**2858**	**6**	**4.0**

Table 51 : Predominant axillary technique used by surgeons with a >10 caseload													
	Sentinel procedure						**Other axillary procedure**				**Unknown**		
	BDO		**IO**		**IBD**		**BDS**		**O**				
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**Total**
N East, Yorks & Humber	3	7	0	0	10	22	8	17	22	48	3	7	46
East Midlands	0	0	2	8	11	44	3	12	9	36	0	0	25
East of England	5	14	0	0	20	56	7	19	4	11	0	0	36
London	3	7	0	0	11	26	10	24	11	26	7	17	42
South East Coast	0	0	0	0	0	0	0	0	1	3	28	97	29
South Central	2	8	0	0	11	42	0	0	13	50	0	0	26
South West	2	6	0	0	5	15	4	12	22	67	0	0	33
West Midlands	2	5	0	0	11	30	5	14	17	46	2	5	37
North West	0	0	0	0	8	21	5	13	11	28	15	38	39
Wales	0	0	0	0	2	15	5	38	6	46	0	0	13
Northern Ireland	0	0	0	0	0	0	0	0	8	80	2	20	10
Scotland	2	8	0	0	7	27	7	27	10	38	0	0	26
UK	**19**	**5**	**2**	**1**	**96**	**27**	**54**	**15**	**134**	**37**	**57**	**16**	**362**

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)5
Unknown = No information

Table 52 : Nodal status of invasive cancers with known status				
	Total known nodal status	Positive		Negative
Region		No.	%	No.	%
N East, Yorks & Humber	1602	365	23	1237	77
East Midlands	982	201	20	781	80
East of England	1124	259	23	865	77
London	1016	227	22	789	78
South East Coast	959	241	25	718	75
South Central	925	195	21	730	79
South West	1197	252	21	945	79
West Midlands	1111	267	24	844	76
North West	1282	300	23	982	77
Wales	634	141	22	493	78
Northern Ireland	180	37	21	143	79
Scotland	1051	258	25	793	75
United Kingdom	**12063**	**2743**	**23**	**9320**	**77**

Table 53 : Status of 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	1602	138	8.6	10	0.6	6	0.4	87	5.4	35	2.2	0	0.0
East Midlands	982	67	6.8	1	0.1	6	0.6	20	2.0	40	4.1	0	0.0
East of England	1124	284	25.3	8	0.7	5	0.4	232	20.6	39	3.5	0	0.0
London	1016	171	16.8	8	0.8	2	0.2	134	13.2	27	2.7	0	0.0
South East Coast	959	194	20.2	1	0.1	7	0.7	39	4.1	147	15.3	0	0.0
South Central	925	183	19.8	7	0.8	2	0.2	140	15.1	34	3.7	0	0.0
South West	1197	126	10.5	3	0.3	8	0.7	57	4.8	58	4.8	0	0.0
West Midlands	1111	139	12.5	9	0.8	5	0.5	96	8.6	29	2.6	0	0.0
North West	1282	143	11.2	1	0.1	9	0.7	90	7.0	43	3.4	0	0.0
Wales	634	80	12.6	1	0.2	1	0.2	61	9.6	17	2.7	0	0.0
Northern Ireland	180	19	10.6	1	0.6	0	0.0	6	3.3	12	6.7	0	0.0
Scotland	1051	75	7.1	2	0.2	2	0.2	47	4.5	24	2.3	0	0.0
United Kingdom	**12063**	**1619**	**13.4**	**52**	**0.4**	**53**	**0.4**	**1009**	**8.4**	**505**	**4.2**	**0**	**0.0**

Table 54 : 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	36	23	122	77	307	23	1034	77
East Midlands	12	11	94	89	115	21	429	79
East of England	93	18	426	82	166	27	435	72
London	85	19	361	81	141	25	424	75
South East Coast	15	14	95	86	160	28	416	72
South Central	65	19	278	81	130	22	452	78
South West	72	26	207	74	152	20	624	80
West Midlands	51	19	222	81	214	26	620	74
North West	41	15	233	85	116	29	289	71
Wales	12	11	100	89	2	3	64	97
Northern Ireland	2	22	7	78	35	20	136	80
Scotland	34	15	195	85	138	25	432	77
United Kingdom	**518**	**18**	**2340**	**82**	**1676**	**24**	**5355**	**76**

Table 55 : 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	10	100	0	0	10	2	8	24	92	26
East Midlands	1	100	0	0	1	11	100	0	0	11
East of England	8	100	0	0	8	46	54	39	46	85
London	8	100	0	0	8	57	74	20	26	77
South East Coast	1	100	0	0	1	10	71	4	29	14
South Central	7	100	0	0	7	19	33	39	67	58
South West	3	100	0	0	3	36	52	33	48	69
West Midlands	9	100	0	0	9	25	60	17	40	42
North West	1	100	0	0	1	23	58	17	43	40
Wales	1	100	0	0	1	7	64	4	36	11
Northern Ireland	1	100	0	0	1	0	0	1	100	1
Scotland	2	100	0	0	2	27	84	5	16	32
United Kingdom	**52**	**100**	**0**	**0**	**52**	**263**	**56**	**203**	**44**	**466**

Table 56 : 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	421	114	27	0	0	307	73	0	0
East Midlands	233	79	34	0	0	154	66	0	0
East of England	300	75	25	0	0	225	75	0	0
London	318	76	24	0	0	232	73	10	3
South East Coast	254	61	24	0	0	183	72	10	4
South Central	218	53	24	0	0	163	75	2	1
South West	357	64	18	1	0	292	82	0	0
West Midlands	244	63	26	0	0	181	74	0	0
North West	307	103	34	0	0	204	66	0	0
Wales	174	51	29	0	0	123	71	0	0
Northern Ireland	39	11	28	0	0	28	72	0	0
Scotland	257	74	29	0	0	183	71	0	0
United Kingdom	**3122**	**824**	**26**	**1**	**0**	**2275**	**73**	**22**	**0.7**

Table 57 : Nodal status of nodes with status known for non-invasive cancers					
	Total known nodal status	Positive		Negative	
Region		No.	%	No.	%
N East, Yorks & Humber	114	2	2	112	98
East Midlands	79	0	0	79	100
East of England	75	0	0	75	100
London	76	1	1	75	99
South East Coast	61	1	2	60	98
South Central	53	0	0	53	100
South West	64	0	0	64	100
West Midlands	63	0	0	63	100
North West	103	0	0	103	100
Wales	51	0	0	51	100
Northern Ireland	11	0	0	11	100
Scotland	74	2	3	72	97
United Kingdom	**824**	**6**	**1**	**818**	**99**

Table 58 : Average number of nodes obtained - non-invasive cancers			
Region	**Total with known nodal status**	**Mean number of nodes examined**	**Median number of nodes examined**
N East, Yorks & Humber	114	6	5.0
East Midlands	79	6	5.0
East of England	75	5	4.0
London	76	6	4.5
South East Coast	61	5	4.0
South Central	53	6	4.0
South West	64	6	5.0
West Midlands	63	5	5.0
North West	103	5	5.0
Wales	51	6	5.0
Northern Ireland	11	6	3.0
Scotland	74	5	4.0
United Kingdom	**824**	**5**	**5.0**

Table 59 : Treatment for non-invasive cancers with known nodal status					
	Total	**Conservation**		**Mastectomy**	
Region		**No.**	**%**	**No.**	**%**
N East, Yorks & Humber	114	20	18	94	82
East Midlands	79	5	6	74	94
East of England	75	18	24	57	76
London	76	13	17	63	83
South East Coast	61	13	21	48	79
South Central	53	9	17	44	83
South West	64	18	28	46	72
West Midlands	63	7	11	56	89
North West	103	23	22	80	78
Wales	51	9	18	42	82
Northern Ireland	11	4	36	7	64
Scotland	74	9	12	65	88
United Kingdom	**824**	**148**	**18**	**676**	**82**

Table 60 : Non-operative history for non-invasive cancers with known nodal status treated by conservation											
	Total	**B5A**		**B5B**		**B5C**		**C5 only**		**No C5/B5**	
Region		**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
N East, Yorks & Humber	20	17	85	0	0	1	5	2	10	0	0
East Midlands	5	5	100	0	0	0	0	0	0	0	0
East of England	18	13	72	1	6	2	11	0	0	2	11
London	13	10	77	1	8	1	8	1	8	0	0
South East Coast	13	12	92	0	0	0	0	1	8	0	0
South Central	9	6	67	1	11	1	11	1	11	0	0
South West	18	13	72	3	17	0	0	1	6	1	6
West Midlands	7	6	86	1	14	0	0	0	0	0	0
North West	23	17	74	1	4	0	0	2	9	3	13
Wales	9	5	56	4	44	0	0	0	0	0	0
Northern Ireland	4	2	50	0	0	0	0	2	50	0	0
Scotland	9	5	56	1	11	0	0	2	22	1	11
United Kingdom	**148**	**111**	**75**	**13**	**9**	**5**	**3**	**12**	**8**	**7**	**5**

Table 61 : Grade of invasive cancers												
	Grade I		Grade II		Grade III		Not assessable		Unknown		Total	
Region	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	494	31	786	49	320	20	7	0	11	1	1618	100
East Midlands	292	29	486	49	200	20	7	1	10	1	995	100
East of England	325	28	601	51	233	20	11	1	10	1	1180	100
London	308	28	565	51	188	17	22	2	22	2	1105	100
South East Coast	290	29	497	49	216	21	5	0	3	0	1011	100
South Central	288	31	456	48	188	20	10	1	0	0	942	100
South West	347	28	655	54	212	17	6	0	4	0	1224	100
West Midlands	321	29	581	52	218	19	0	0	2	0	1122	100
North West	402	30	654	50	239	18	10	1	14	1	1319	100
Wales	191	30	315	49	128	20	1	0	5	1	640	100
Northern Ireland	57	31	90	48	36	19	1	1	2	1	186	100
Scotland	245	23	540	51	257	24	7	1	8	1	1057	100
United Kingdom	**3560**	**29**	**6226**	**50**	**2435**	**20**	**87**	**1**	**91**	**1**	**12399**	**100**

Table 62 : Data completeness for invasive cancers (with surgery)									
	Unknown invasive size		Unknown nodal status		Unknown grade		Unknown NPI		Total invasive
Region	No.	%	No.	%	No.	%	No.	%	
N East, Yorks & Humber	13	1	16	1	11	1	31	2	1618
East Midlands	13	1	13	1	10	1	29	3	995
East of England	11	1	56	5	10	1	79	7	1180
London	31	3	89	8	22	2	116	10	1105
South East Coast	3	0	52	5	3	0	59	6	1011
South Central	1	0	17	2	0	0	27	3	942
South West	2	0	27	2	4	0	34	3	1224
West Midlands	6	1	11	1	2	0	17	2	1122
North West	7	1	37	3	14	1	63	5	1319
Wales	1	0	6	1	5	1	13	2	640
Northern Ireland	3	2	6	3	2	1	11	6	186
Scotland	3	0	6	1	8	1	19	2	1057
United Kingdom	**94**	**1**	**336**	**3**	**91**	**1**	**498**	**4**	**12399**

Table 63 : NPI Group of invasive cancers												
	EPG		GPG		MPG1		MPG2		PPG		Total	
Region	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	388	24	571	36	363	23	174	11	91	6	1587	100
East Midlands	239	25	360	37	224	23	94	10	49	5	966	100
East of England	259	24	408	37	256	23	108	10	70	6	1101	100
London	216	22	385	39	223	23	102	10	63	6	989	100
South East Coast	215	23	333	35	218	23	120	13	66	7	952	100
South Central	235	26	322	35	202	22	95	10	61	7	915	100
South West	281	24	454	38	279	23	110	9	66	6	1190	100
West Midlands	245	22	420	38	238	22	137	12	65	6	1105	100
North West	296	24	453	36	298	24	132	11	77	6	1256	100
Wales	164	26	216	34	141	22	60	10	46	7	627	100
Northern Ireland	40	23	69	39	38	22	20	11	8	5	175	100
Scotland	198	19	366	35	268	26	128	12	78	8	1038	100
United Kingdom	**2776**	**23**	**4357**	**37**	**2748**	**23**	**1280**	**11**	**740**	**6**	**11901**	**100**

Table 64 : Annual screening surgical caseload per surgeon											
Region	Total surgeons	<10 cases		10-19 cases		20-29 cases		30-99 cases		100+ cases	
		No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	64	18	28	6	9	13	20	26	41	1	2
East Midlands	31	6	19	2	6	3	10	20	65	0	0
East of England	62	23	37	7	11	12	19	20	32	0	0
London	73	31	42	10	14	15	21	16	22	1	1
South East Coast	48	20	42	4	8	6	13	17	35	1	2
South Central	45	19	42	4	9	1	2	21	47	0	0
South West	38	5	13	2	5	6	16	24	63	1	3
West Midlands	57	20	35	8	14	7	12	22	39	0	0
North West	58	19	33	6	10	8	14	24	41	1	2
Wales	21	8	38	1	5	0	0	11	52	1	5
Northern Ireland	14	4	29	5	36	2	14	3	21	0	0
Scotland	46	20	43	5	11	3	7	15	33	3	7
United Kingdom	**511**	**149**	**29**	**57**	**11**	**76**	**15**	**219**	**43**	**10**	**2**

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 65 : Screening cases per surgeon					
Region	Total surgeons	Mean	Min.	Median	Max.
N East, Yorks & Humber	64	33.1	1	28	128
East Midlands	31	43.0	1	53	90
East of England	62	24.7	1	20	81
London	73	20.3	1	15	100
South East Coast	48	26.9	1	19	127
South Central	45	26.7	1	18	91
South West	38	41.8	3	35.5	109
West Midlands	57	24.9	1	20	88
North West	58	29.1	1	23	107
Wales	21	40.7	1	52	104
Northern Ireland	14	16.4	1	13.5	39
Scotland	46	29.3	1	16.5	165
United Kingdom	**511**	**31.6**	**1**	**23**	**165**

Table 66 : 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	2102	18	1	2049	97	34	2	1	0
East Midlands	1273	0	0	1214	95	58	5	1	0
East of England	1521	16	1	1477	97	27	2	1	0
London	1472	22	1	1421	97	27	2	2	0
South East Coast	1300	8	1	1292	99	0	0	0	0
South Central	1177	4	0	1146	97	26	2	1	0
South West	1598	10	1	1588	99	0	0	0	0
West Midlands	1401	8	1	1367	98	26	2	0	0
North West	1675	1	0	1661	99	13	1	0	0
Wales	842	0	0	829	98	13	2	0	0
Northern Ireland	232	2	1	230	99	0	0	0	0
Scotland	1351	2	0	1349	100	0	0	0	0
United Kingdom	**15944**	**91**	**1**	**15623**	**98**	**224**	**1**	**6**	**0**

Table 67 : 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	2084	61	3	82	4	338	16	1511	71	128	6
East Midlands	1273	19	1	28	2	74	6	1212	91	0	0
East of England	1505	52	3	93	6	286	19	1103	72	0	0
London	1450	122	8	146	10	355	24	758	51	100	7
South East Coast	1292	56	4	56	4	154	12	899	70	127	10
South Central	1173	37	3	55	5	23	2	1086	90	0	0
South West	1588	30	2	33	2	151	10	1265	80	109	7
West Midlands	1393	46	3	121	9	178	13	1074	76	0	0
North West	1674	78	5	95	6	190	11	1217	72	107	6
Wales	842	24	3	12	1	0	0	715	84	104	12
Northern Ireland	230	20	9	69	30	41	18	100	43	0	0
Scotland	1349	57	4	75	6	77	6	747	55	393	29
United Kingdom	**15853**	**480**	**3**	**828**	**5**	**1889**	**12**	**11716**	**73**	**1176**	**7**

Table 68 : Explanations for surgeons treating less than 10 screening cases in 2005/06										
Region	Total	Other caseload >30 year	Joined NHS BSP	Left NHS BSP	Patient choice	Plastic surgeon	Private practice	Not screening in area	No information	Other
N East, Yorks & Humber	18	13	2	2	0	0	0	0	0	1
East Midlands	6	2	0	2	0	2	0	0	0	0
East of England	23	10	0	1	0	6	3	1	1	1
London	31	9	4	3	1	1	3	1	9	0
South East Coast	20	4	1	1	6	0	2	3	3	0
South Central	19	5	0	3	2	6	3	0	0	0
South West	5	3	1	1	0	0	0	0	0	0
West Midlands	20	7	3	1	3	5	0	0	0	1
North West	19	14	2	2	0	0	0	0	0	1
Wales	8	7	0	0	0	1	0	0	0	0
Northern Ireland	4	4	0	0	0	0	0	0	0	0
Scotland	20	16	0	1	3	0	0	0	0	0
United Kingdom	**149**	**69**	**10**	**15**	**9**	**21**	**7**	**5**	**11**	**2**

Table 69 : Number of therapeutic operations for cancers with a non-operative diagnosis (C5 and/or B5)														
Region	0		1		2		3+		Unknown		Total		Repeat (2+) rate	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	35	2	1626	82	305	15	20	1	0	0	1986	100	325	16
East Midlands	32	3	985	81	179	15	17	1	0	0	1213	100	196	16
East of England	31	2	1184	84	188	13	9	1	1	0	1413	100	197	14
London	35	3	1079	79	211	15	20	1	22	2	1367	100	231	17
South East Coast	22	2	1003	81	183	15	23	2	0	0	1231	100	206	17
South Central	8	1	895	83	160	15	18	2	0	0	1081	100	178	16
South West	14	1	1218	81	251	17	20	1	0	0	1503	100	271	18
West Midlands	19	1	1103	83	190	14	19	1	0	0	1331	100	209	16
North West	14	1	1386	89	152	10	13	1	0	0	1565	100	165	11
Wales	20	2	671	84	100	12	12	1	0	0	803	100	112	14
Northern Ireland	2	1	187	85	30	14	1	0	0	0	220	100	31	14
Scotland	21	2	1078	84	174	14	13	1	1	0	1287	100	187	15
United Kingdom	**253**	**2**	**12415**	**83**	**2123**	**14**	**185**	**1**	**24**	**0**	**15000**	**100**	**2308**	**15**

Table 70 : 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	31	2	1364	83	233	14	15	1	0	0	1643	100	248	15
East Midlands	28	3	842	83	135	13	15	1	0	0	1020	100	150	15
East of England	48	4	1002	83	148	12	6	0	1	0	1205	100	154	13
London	39	3	901	80	161	14	17	2	14	1	1132	100	178	16
South East Coast	32	3	835	81	144	14	17	2	0	0	1028	100	161	16
South Central	12	1	798	84	125	13	15	2	0	0	950	100	140	15
South West	18	1	991	80	207	17	16	1	0	0	1232	100	223	18
West Midlands	26	2	941	83	160	14	13	1	0	0	1140	100	173	15
North West	24	2	1176	88	118	9	12	1	0	0	1330	100	130	10
Wales	21	3	547	83	83	13	7	1	0	0	658	100	90	14
Northern Ireland	3	2	156	83	28	15	0	0	0	0	187	100	28	15
Scotland	26	2	896	83	138	13	14	1	1	0	1075	100	152	14
United Kingdom	**308**	**2**	**10449**	**83**	**1680**	**13**	**147**	**1**	**16**	**0**	**12600**	**100**	**1827**	**15**

Table 71 : 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	42	10	310	73	69	16	6	1	0	0	427	100	75	18
East Midlands	25	11	162	68	48	20	3	1	0	0	238	100	51	21
East of England	47	15	215	70	41	13	3	1	0	0	306	100	44	14
London	47	14	214	66	51	16	3	1	10	3	325	100	54	17
South East Coast	31	12	180	70	40	16	6	2	0	0	257	100	46	18
South Central	29	13	150	69	35	16	4	2	0	0	218	100	39	18
South West	38	11	267	74	50	14	5	1	0	0	360	100	55	15
West Midlands	19	8	186	76	35	14	5	2	0	0	245	100	40	16
North West	51	17	224	73	30	10	2	1	0	0	307	100	32	10
Wales	9	5	139	79	23	13	5	3	0	0	176	100	28	16
Northern Ireland	3	8	33	83	3	8	1	3	0	0	40	100	4	10
Scotland	36	14	190	73	33	13	1	0	0	0	260	100	34	13
United Kingdom	**377**	**12**	**2270**	**72**	**458**	**14**	**44**	**1**	**10**	**0**	**3159**	**100**	**502**	**16**

Table 72 : Number of therapeutic operations (B5b (invasive) core biopsies : invasive after surgery)												
	1		2		3+		Unknown		Total		Repeat (2+) rate	
Region	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	1124	87	152	12	9	1	0	0	1285	100	161	13
East Midlands	791	87	112	12	10	1	0	0	913	100	122	13
East of England	900	87	126	12	4	0	1	0	1031	100	130	13
London	788	84	124	13	10	1	14	1	936	100	134	14
South East Coast	686	89	78	10	8	1	0	0	772	100	86	11
South Central	699	87	96	12	10	1	0	0	805	100	106	13
South West	867	85	148	14	11	1	0	0	1026	100	159	15
West Midlands	838	87	115	12	9	1	0	0	962	100	124	13
North West	975	92	79	7	9	1	0	0	1063	100	88	8
Wales	502	88	63	11	5	1	0	0	570	100	68	12
Northern Ireland	74	79	20	21	0	0	0	0	94	100	20	21
Scotland	850	88	110	11	7	1	1	0	968	100	117	12
United Kingdom	**9094**	**87**	**1223**	**12**	**92**	**1**	**16**	**0**	**10425**	**100**	**1315**	**13**

Table 73 : Sequence of operations (B5b (invasive) core biopsies : invasive after 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	772	60	339	26	75	6	34	3	52	4	2	0	11	1	0	0	1285	100
East Midlands	552	60	234	26	74	8	17	2	30	3	0	0	6	1	0	0	913	100
East of England	688	67	187	18	33	3	18	2	72	7	7	1	25	2	1	0	1031	100
London	568	61	177	19	53	6	20	2	32	3	23	2	49	5	14	1	936	100
South East Coast	522	68	136	18	31	4	11	1	39	5	5	1	28	4	0	0	772	100
South Central	525	65	163	20	39	5	10	1	55	7	2	0	11	1	0	0	805	100
South West	704	69	148	14	56	5	19	2	73	7	10	1	16	2	0	0	1026	100
West Midlands	661	69	175	18	49	5	26	3	43	4	6	1	2	0	0	0	962	100
North West	699	66	249	23	16	2	21	2	38	4	14	1	26	2	0	0	1063	100
Wales	367	64	134	24	31	5	14	2	20	4	3	1	1	0	0	0	570	100
Northern Ireland	61	65	13	14	7	7	8	9	5	5	0	0	0	0	0	0	94	100
Scotland	630	65	213	22	47	5	11	1	31	3	27	3	8	1	1	0	968	100
United Kingdom	**6749**	**65**	**2168**	**21**	**511**	**5**	**209**	**2**	**490**	**5**	**99**	**1**	**183**	**2**	**16**	**0**	**10425**	**100**

Table 74 : 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	146	84	25	14	2	1	0	0	173	100	27	16
East Midlands	3	100	0	0	0	0	0	0	3	100	0	0
East of England	29	97	1	3	0	0	0	0	30	100	1	3
London	44	83	8	15	1	2	0	0	53	100	9	17
South East Coast	107	80	23	17	3	2	0	0	133	100	26	20
South Central	41	91	3	7	1	2	0	0	45	100	4	9
South West	40	78	10	20	1	2	0	0	51	100	11	22
West Midlands	63	88	8	11	1	1	0	0	72	100	9	13
North West	167	88	23	12	0	0	0	0	190	100	23	12
Wales	1	100	0	0	0	0	0	0	1	100	0	0
Northern Ireland	71	95	4	5	0	0	0	0	75	100	4	5
Scotland	5	71	2	29	0	0	0	0	7	100	2	29
United Kingdom	**717**	**86**	**107**	**13**	**9**	**1**	**0**	**0**	**833**	**100**	**116**	**14**

Table 75 : 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	106	61	40	23	8	5	12	7	7	4	0	0	0	0	173	100
East Midlands	2	67	1	33	0	0	0	0	0	0	0	0	0	0	3	100
East of England	19	63	4	13	0	0	1	3	0	0	0	0	6	20	30	100
London	39	74	4	8	1	2	1	2	6	11	1	2	1	2	53	100
South East Coast	86	65	11	8	10	8	1	1	13	10	2	2	10	8	133	100
South Central	33	73	7	16	0	0	1	2	1	2	2	4	1	2	45	100
South West	37	73	3	6	5	10	0	0	6	12	0	0	0	0	51	100
West Midlands	53	74	10	14	3	4	3	4	3	4	0	0	0	0	72	100
North West	138	73	23	12	6	3	7	4	10	5	0	0	6	3	190	100
Wales	0	0	1	100	0	0	0	0	0	0	0	0	0	0	1	100
Northern Ireland	58	77	11	15	3	4	1	1	0	0	0	0	2	3	75	100
Scotland	5	71	0	0	0	0	0	0	0	0	2	29	0	0	7	100
United Kingdom	**576**	**69**	**115**	**14**	**36**	**4**	**27**	**3**	**46**	**6**	**7**	**1**	**26**	**3**	**833**	**100**

Table 76 : Number of therapeutic operations (B5a (non-invasive) core biopsies: non-invasive or micro-invasive after surgery)												
	1		2		3+		Unknown		Total		Repeat (2+) rate	
Region	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	269	79	67	20	5	1	0	0	341	100	72	21
East Midlands	156	77	44	22	3	1	0	0	203	100	47	23
East of England	171	81	37	18	3	1	0	0	211	100	40	19
London	180	76	47	20	3	1	8	3	238	100	50	21
South East Coast	170	79	39	18	6	3	0	0	215	100	45	21
South Central	127	77	35	21	4	2	0	0	166	100	39	23
South West	234	82	45	16	5	2	0	0	284	100	50	18
West Midlands	169	82	30	15	6	3	0	0	205	100	36	18
North West	222	87	32	13	1	0	0	0	255	100	33	13
Wales	125	83	20	13	5	3	0	0	150	100	25	17
Northern Ireland	32	91	2	6	1	3	0	0	35	100	3	9
Scotland	180	84	34	16	1	0	0	0	215	100	35	16
United Kingdom	**2035**	**81**	**432**	**17**	**43**	**2**	**8**	**0**	**2518**	**100**	**475**	**19**

Table 77 : Sequence of operations (B5a (non-invasive) core biopsies : non-invasive or micro-invasive after 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	159	47	74	22	31	9	23	7	19	6	17	5	18	5	0	0	341	100
East Midlands	76	37	67	33	28	14	6	3	9	4	9	4	8	4	0	0	203	100
East of England	105	50	40	19	14	7	18	9	14	7	9	4	11	5	0	0	211	100
London	117	49	39	16	23	10	15	6	11	5	18	8	7	3	8	3	238	100
South East Coast	105	49	38	18	28	13	16	7	13	6	9	4	6	3	0	0	215	100
South Central	80	48	30	18	19	11	11	7	6	4	14	8	6	4	0	0	166	100
South West	177	62	28	10	24	8	19	7	18	6	8	3	10	4	0	0	284	100
West Midlands	110	54	42	20	18	9	13	6	8	4	8	4	6	3	0	0	205	100
North West	116	45	74	29	13	5	12	5	24	9	13	5	3	1	0	0	255	100
Wales	75	50	38	25	13	9	7	5	6	4	5	3	6	4	0	0	150	100
Northern Ireland	22	63	9	26	0	0	1	3	2	6	1	3	0	0	0	0	35	100
Scotland	118	55	55	26	22	10	3	1	6	3	10	5	1	0	0	0	215	100
United Kingdom	**1260**	**50**	**534**	**21**	**233**	**9**	**144**	**6**	**136**	**5**	**121**	**5**	**82**	**3**	**8**	**0**	**2518**	**100**

Table 78 : Number of therapeutic operations (B5a (non-invasive) core biopsies : invasive after surgery)												
	1		2		3+		Unknown		Total		Repeat (2+) rate	
Region	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	44	44	51	52	4	4	0	0	99	100	55	56
East Midlands	32	56	21	37	4	7	0	0	57	100	25	44
East of England	30	68	12	27	2	5	0	0	44	100	14	32
London	45	58	26	34	6	8	0	0	77	100	32	42
South East Coast	34	43	40	50	6	8	0	0	80	100	46	58
South Central	23	45	25	49	3	6	0	0	51	100	28	55
South West	48	52	42	45	3	3	0	0	93	100	45	48
West Midlands	28	43	34	52	3	5	0	0	65	100	37	57
North West	13	41	16	50	3	9	0	0	32	100	19	59
Wales	30	64	15	32	2	4	0	0	47	100	17	36
Northern Ireland	6	60	4	40	0	0	0	0	10	100	4	40
Scotland	28	49	25	44	4	7	0	0	57	100	29	51
United Kingdom	**361**	**51**	**311**	**44**	**40**	**6**	**0**	**0**	**712**	**100**	**351**	**49**

Table 79 : Sequence of operations (B5a (non-invasive) core biopsies : invasive after 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	29	13	13	15	15	14	14	7	7	19	19	2	2	99	100
East Midlands	23	40	5	9	5	9	10	18	3	5	7	12	4	7	57	100
East of England	10	23	14	32	4	9	3	7	1	2	5	11	7	16	44	100
London	20	26	9	12	4	5	9	12	12	16	7	9	16	21	77	100
South East Coast	20	25	6	8	7	9	18	23	8	10	12	15	9	11	80	100
South Central	13	25	7	14	9	18	6	12	2	4	10	20	4	8	51	100
South West	28	30	14	15	14	15	1	1	19	20	10	11	7	8	93	100
West Midlands	13	20	7	11	7	11	14	22	2	3	13	20	9	14	65	100
North West	6	19	5	16	5	16	3	9	2	6	9	28	2	6	32	100
Wales	16	34	11	23	4	9	7	15	3	6	3	6	3	6	47	100
Northern Ireland	1	10	2	20	2	20	0	0	1	10	1	10	3	30	10	100
Scotland	22	39	6	11	7	12	13	23	1	2	6	11	2	4	57	100
United Kingdom	**201**	**28**	**99**	**14**	**83**	**12**	**98**	**14**	**61**	**9**	**102**	**14**	**68**	**10**	**712**	**100**

Table 80 : Repeat therapeutic operation rate for invasive cancers of different size with a non-operative diagnosis (B5 and/or C5)						
	<20mm invasive size, <20mm whole size			<20mm invasive size, 30+mm whole size		
	With repeat op			With repeat op		
Region	**No**	**%**	**Total**	**No**	**%**	**Total**
N East, Yorks & Humber	109	12	897	34	39	88
East Midlands	82	13	637	16	30	53
East of England	73	10	745	13	38	34
London	68	13	537	16	36	45
South East Coast	66	12	547	9	22	41
South Central	47	12	405	17	39	44
South West	109	14	752	20	36	55
West Midlands	69	10	678	0	-	0
North West	55	7	818	8	28	29
Wales	45	11	421	12	40	30
Northern Ireland	15	13	114	1	33	3
Scotland	77	12	642	15	33	46
United Kingdom	**815**	**11**	**7193**	**161**	**34**	**468**

Table 81 : Repeat therapeutic operation rate for invasive cancers diagnosed by core biopsy with/without B5a non-operative diagnosis						
	All cancers			Cancers excluding B5A		
Region	**No**	**%**	**Total**	**No**	**%**	**Total**
N East, Yorks & Humber	221	15	1438	166	12	1339
East Midlands	148	15	997	123	13	940
East of England	151	13	1134	137	13	1090
London	167	16	1043	135	14	966
South East Coast	132	15	869	86	11	789
South Central	134	16	864	106	13	813
South West	208	18	1151	163	15	1058
West Midlands	161	15	1045	124	13	980
North West	107	10	1108	88	8	1076
Wales	85	13	639	68	11	592
Northern Ireland	24	23	105	20	21	95
Scotland	148	14	1046	119	12	989
United Kingdom	**1686**	**15**	**11439**	**1335**	**12**	**10727**

APPENDIX F

ADJUVANT THERAPY AUDIT FOR 1 APRIL 2004 – 31 MARCH 2005 WITH TUMOUR DATA FROM THE 2004/05 AUDIT OF SCREEN DETECTED BREAST CANCERS

Table 82 : 2004/05 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	1969	378	19	100	5	1491	76	1341	68
East Midlands	1072	0	0	43	4	1029	96	1010	94
East of England	1213	287	24	37	3	889	73	828	68
London	1175	2	0	83	7	1090	93	1005	86
South East Coast	1118	0	0	150	13	968	87	659	59
South Central	981	0	0	35	4	946	96	880	90
South West	1367	137	10	47	3	1183	87	1041	76
West Midlands	1289	0	0	139	11	1150	89	994	77
North West	1543	0	0	63	4	1480	96	1306	85
Wales	686	0	0	60	9	626	91	550	80
Northern Ireland	226	49	22	9	4	168	74	130	58
Scotland	1174	397	34	7	1	770	66	745	63
United Kingdom	**13813**	**1250**	**9**	**773**	**6**	**11790**	**85**	**10489**	**76**

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

Table 83 : 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	1491	1443	97	1483	99	1389	93	1341	90
East Midlands	1029	1023	99	1028	100	1010	98	1010	98
East of England	889	850	96	877	99	864	97	828	93
London	1090	1047	96	1053	97	1056	97	1005	92
South East Coast	968	810	84	965	100	808	83	659	68
South Central	946	913	97	930	98	892	94	880	93
South West	1183	1168	99	1154	98	1069	90	1041	88
West Midlands	1150	1150	100	1020	89	1008	88	994	86
North West	1480	1418	96	1376	93	1371	93	1306	88
Wales	626	580	93	575	92	603	96	550	88
Northern Ireland	168	149	89	152	90	159	95	130	77
Scotland	770	752	98	764	99	764	99	745	97
United Kingdom	**11790**	**11303**	**96**	**11377**	**96**	**10993**	**93**	**10489**	**89**

Table 84 : ER status of included cases

Region	Invasive						Total Invasive	Non-invasive						Total non-invasive
	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	927	81	127	11	87	8	1141	40	12	36	11	249	77	325
East Midlands	706	88	82	10	18	2	806	62	29	26	12	123	58	211
East of England	614	89	61	9	16	2	691	38	21	10	5	136	74	184
London	744	84	81	9	65	7	890	74	42	22	12	81	46	177
South East Coast	603	84	70	10	42	6	715	89	39	35	15	106	46	230
South Central	647	84	80	10	43	6	770	74	43	22	13	77	45	173
South West	797	86	86	9	40	4	923	97	38	34	13	123	48	254
West Midlands	817	88	90	10	17	2	924	109	51	16	8	87	41	212
North West	1015	87	109	9	46	4	1170	154	54	44	16	85	30	283
Wales	479	90	47	9	5	1	531	37	40	7	8	48	52	92
Northern Ireland	115	87	13	10	4	3	132	21	58	9	25	6	17	36
Scotland	572	92	45	7	5	1	622	102	72	20	14	19	13	141
United Kingdom	**8036**	**86**	**891**	**10**	**388**	**4**	**9315**	**897**	**39**	**281**	**12**	**1140**	**49**	**2318**

Table 85 : PgR status of included cases								
	Positive		Negative		Not Done or Unknown		Total	
Region	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	614	41	237	16	640	43	1491	100
East Midlands	192	19	85	8	752	73	1029	100
East of England	199	22	70	8	620	70	889	100
London	630	58	180	17	280	26	1090	100
South East Coast	419	43	149	15	400	41	968	100
South Central	486	51	169	18	291	31	946	100
South West	483	41	180	15	520	44	1183	100
West Midlands	526	46	166	14	458	40	1150	100
North West	896	61	288	19	296	20	1480	100
Wales	132	21	63	10	431	69	626	100
Northern Ireland	38	23	22	13	108	64	168	100
Scotland	220	29	110	14	440	57	770	100
United Kingdom	**4835**	**41**	**1719**	**15**	**5236**	**44**	**11790**	**100**

Table 86 : PgR status of ER negative invasive cases								
	Positive		Negative		Not Done or Unknown		Total	
Region	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	6	5	98	77	23	18	127	100
East Midlands	5	6	38	46	39	48	82	100
East of England	3	5	34	56	24	39	61	100
London	6	7	72	89	3	4	81	100
South East Coast	2	3	66	94	2	3	70	100
South Central	9	11	69	86	2	3	80	100
South West	4	5	62	72	20	23	86	100
West Midlands	8	9	71	79	11	12	90	100
North West	6	6	99	91	4	4	109	100
Wales	1	2	39	83	7	15	47	100
Northern Ireland	0	0	3	23	10	77	13	100
Scotland	0	0	42	93	3	7	45	100
United Kingdom	**50**	**6**	**693**	**78**	**148**	**17**	**891**	**100**

Table 87 : HER-2 status of invasive cancers								
	Positive		Negative		Not Done or Unknown		Total	
Region	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	34	3	257	23	850	74	1141	100
East Midlands	4	0	21	3	781	97	806	100
East of England	36	5	100	14	555	80	691	100
London	69	8	252	28	569	64	890	100
South East Coast	14	2	52	7	649	91	715	100
South Central	42	5	180	23	548	71	770	100
South West	120	13	278	30	525	57	923	100
West Midlands	28	3	118	13	778	84	924	100
North West	100	9	273	23	797	68	1170	100
Wales	28	5	51	10	452	85	531	100
Northern Ireland	9	7	46	35	77	58	132	100
Scotland	87	14	257	41	278	45	622	100
United Kingdom	**571**	**6**	**1885**	**20**	**6859**	**74**	**9315**	**100**

Table 88 : Radiotherapy						
	Radiotherapy		No radiotherapy		Total	
Region	No.	%	No.	%	No.	%
N East, Yorks & Humber	896	62	547	38	1443	100
East Midlands	653	64	370	36	1023	100
East of England	635	75	215	25	850	100
London	750	72	297	28	1047	100
South East Coast	415	51	395	49	810	100
South Central	615	67	298	33	913	100
South West	814	70	354	30	1168	100
West Midlands	819	71	331	29	1150	100
North West	828	58	590	42	1418	100
Wales	431	74	149	26	580	100
Northern Ireland	119	80	30	20	149	100
Scotland	513	68	239	32	752	100
United Kingdom	**7488**	**66**	**3815**	**34**	**11303**	**100**

Table 89 : Chemotherapy						
	Chemotherapy		No chemotherapy		Total	
Region	No.	%	No.	%	No.	%
N East, Yorks & Humber	231	16	1252	84	1483	100
East Midlands	146	14	882	86	1028	100
East of England	112	13	765	87	877	100
London	222	21	831	79	1053	100
South East Coast	127	13	838	87	965	100
South Central	159	17	771	83	930	100
South West	189	16	965	84	1154	100
West Midlands	187	18	833	82	1020	100
North West	198	14	1178	86	1376	100
Wales	135	23	440	77	575	100
Northern Ireland	32	21	120	79	152	100
Scotland	174	23	590	77	764	100
United Kingdom	**1912**	**17**	**9465**	**83**	**11377**	**100**

Table 90 : Hormone therapy						
	Hormone therapy		No hormone therapy		Total	
Region	No.	%	No.	%	No.	%
N East, Yorks & Humber	965	69	424	31	1389	100
East Midlands	692	69	318	31	1010	100
East of England	581	67	283	33	864	100
London	775	73	281	27	1056	100
South East Coast	598	74	210	26	808	100
South Central	604	68	288	32	892	100
South West	805	75	264	25	1069	100
West Midlands	779	77	229	23	1008	100
North West	999	73	372	27	1371	100
Wales	449	74	154	26	603	100
Northern Ireland	135	85	24	15	159	100
Scotland	598	78	166	22	764	100
United Kingdom	**7980**	**73**	**3013**	**27**	**10993**	**100**

Table 91 : Completed cases with adjuvant therapy by age								
	Radiotherapy		Chemotherapy		Hormone Therapy		Total	
Age group	No.	%	No.	%	No.	%	No.	%
0-48	3	50	0	0	4	67	6	100
49	124	66	57	30	127	68	187	100
50-52	997	66	329	22	1047	69	1512	100
53-55	905	70	265	21	904	70	1284	100
56-58	1151	69	326	20	1201	72	1660	100
59-61	1173	70	280	17	1220	72	1687	100
62-64	1051	71	199	13	1085	73	1482	100
65-67	740	64	147	13	866	75	1161	100
68-70	641	64	76	8	749	74	1007	100
71+	293	58	19	4	374	74	503	100
Total	**7078**	**67**	**1698**	**16**	**7577**	**72**	**10489**	**100**

Table 92 : 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	17	1	211	16	137	10	9	1	249	19	50	4	528	39	33	2	107	8	1341
East Midlands	15	1	137	14	133	13	9	1	177	18	34	3	405	40	24	2	76	8	1010
East of England	9	1	112	14	129	16	8	1	68	8	25	3	410	50	7	1	60	7	828
London	23	2	114	11	92	9	18	2	111	11	36	4	463	46	21	2	127	13	1005
South East Coast	9	1	104	16	44	7	4	1	174	26	22	3	259	39	9	1	34	5	659
South Central	6	1	121	14	104	12	13	1	129	15	44	5	372	42	10	1	81	9	880
South West	1	0	136	13	81	8	9	1	150	14	32	3	503	48	14	1	115	11	1041
West Midlands	3	0	83	8	87	9	14	1	123	12	36	4	535	54	19	2	94	9	994
North West	9	1	172	13	118	9	23	2	290	22	33	3	540	41	34	3	87	7	1306
Wales	10	2	39	7	87	16	4	1	62	11	19	3	229	42	28	5	72	13	550
Northern Ireland	0	0	5	4	9	7	0	0	12	9	4	3	84	65	4	3	12	9	130
Scotland	7	1	72	10	55	7	12	2	125	17	24	3	324	43	24	3	102	14	745
United Kingdom	**109**	**1**	**1306**	**12**	**1076**	**10**	**123**	**1**	**1670**	**16**	**359**	**3**	**4652**	**44**	**227**	**2**	**967**	**9**	**10489**

Table 93 : Surgery for included cases								
	No surgery		1 operation		>1 operation		Total	
Region	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	25	2	1164	78	302	20	1491	100
East Midlands	16	2	818	79	195	19	1029	100
East of England	11	1	720	81	158	18	889	100
London	23	2	840	77	227	21	1090	100
South East Coast	10	1	754	78	204	21	968	100
South Central	6	1	753	80	187	20	946	100
South West	1	0	916	77	266	22	1183	100
West Midlands	7	1	938	82	205	18	1150	100
North West	13	1	1261	85	206	14	1480	100
Wales	18	3	494	79	114	18	626	100
Northern Ireland	0	0	141	84	27	16	168	100
Scotland	8	1	630	82	132	17	770	100
United Kingdom	**138**	**1**	**9429**	**80**	**2223**	**19**	**11790**	**100**

Table 94 : First surgery						
	Diagnostic (no non-operative diagnosis)		Therapeutic		Total	
Region	No.	%	No.	%	No.	%
N East, Yorks & Humber	101	7	1365	93	1466	100
East Midlands	47	5	966	95	1013	100
East of England	67	8	811	92	878	100
London	66	6	1001	94	1067	100
South East Coast	76	8	882	92	958	100
South Central	67	7	873	93	940	100
South West	103	9	1079	91	1182	100
West Midlands	66	6	1077	94	1143	100
North West	106	7	1361	93	1467	100
Wales	27	4	581	96	608	100
Northern Ireland	9	5	159	95	168	100
Scotland	64	8	698	92	762	100
United Kingdom	**799**	**7**	**10853**	**93**	**11652**	**100**

Table 95 : Surgery for cases with radiotherapy								
	No surgery		1 operation		>1 operation		Total	
Region	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	5	1	739	82	152	17	896	100
East Midlands	3	0	530	81	120	18	653	100
East of England	4	1	532	84	99	16	635	100
London	2	0	599	80	149	20	750	100
South East Coast	3	1	318	77	94	23	415	100
South Central	1	0	510	83	104	17	615	100
South West	1	0	651	80	162	20	814	100
West Midlands	1	0	692	84	126	15	819	100
North West	1	0	720	87	107	13	828	100
Wales	8	2	356	83	67	16	431	100
Northern Ireland	0	0	102	86	17	14	119	100
Scotland	3	1	424	83	86	17	513	100
United Kingdom	**32**	**0**	**6173**	**82**	**1283**	**17**	**7488**	**100**

Table 96 : Surgery for cases with chemotherapy								
	No surgery		1 operation		>1 operation		Total	
Region	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	3	1	182	79	46	20	231	100
East Midlands	3	2	110	75	33	23	146	100
East of England	2	2	93	83	17	15	112	100
London	6	3	170	77	46	21	222	100
South East Coast	3	2	98	77	26	20	127	100
South Central	0	0	137	86	22	14	159	100
South West	1	1	147	78	41	22	189	100
West Midlands	1	1	151	81	35	19	187	100
North West	4	2	168	85	26	13	198	100
Wales	3	2	98	73	34	25	135	100
Northern Ireland	0	0	24	75	8	25	32	100
Scotland	3	2	148	85	23	13	174	100
United Kingdom	**29**	**2**	**1526**	**80**	**357**	**19**	**1912**	**100**

Table 97 : Invasive status of included cases										
	Invasive		Micro-invasive		Non-invasive		Unknown		Total	
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
N East, Yorks & Humber	1141	77	23	2	325	22	2	0	1491	100
East Midlands	806	78	7	1	211	21	5	0	1029	100
East of England	691	78	13	1	184	21	1	0	889	100
London	890	82	22	2	177	16	1	0	1090	100
South East Coast	715	74	21	2	230	24	2	0	968	100
South Central	770	81	2	0	173	18	1	0	946	100
South West	923	78	5	0	254	21	1	0	1183	100
West Midlands	924	80	14	1	212	18	0	0	1150	100
North West	1170	79	26	2	283	19	1	0	1480	100
Wales	531	85	3	0	92	15	0	0	626	100
Northern Ireland	132	79	0	0	36	21	0	0	168	100
Scotland	622	81	7	1	141	18	0	0	770	100
United Kingdom	**9315**	**79**	**143**	**1**	**2318**	**20**	**14**	**0**	**11790**	**100**

Table 98 : 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	5	5	31	31	83	82	98	97	101	100	101	100	35
East Midlands	3	6	25	53	44	94	46	98	47	100	47	100	29
East of England	11	16	38	57	59	88	65	97	66	99	67	100	27
London	4	6	28	42	51	77	61	92	62	94	66	100	35
South East Coast	2	3	12	16	53	70	75	99	76	100	76	100	50
South Central	5	7	26	39	61	91	66	99	66	99	67	100	35
South West	6	6	29	28	85	83	99	96	100	97	102	99	40
West Midlands	3	5	26	39	52	79	62	94	63	95	64	97	36
North West	7	7	41	39	95	90	103	97	105	99	106	100	36
Wales	3	11	17	63	23	85	27	100	27	100	27	100	26
Northern Ireland	1	11	5	56	8	89	9	100	9	100	9	100	29
Scotland	3	5	19	30	52	81	63	98	64	100	64	100	41
United Kingdom	**53**	**7**	**297**	**37**	**666**	**83**	**774**	**97**	**786**	**98**	**796**	**100**	**36**

Table 99 : Time from assessment to first therapeutic surgery (cases with 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	80	6	784	57	1317	96	1349	99	1358	99	1364	100	28
East Midlands	109	11	644	67	928	96	952	99	956	99	959	99	27
East of England	77	9	522	64	784	97	801	99	803	99	807	100	27
London	52	5	489	49	905	91	970	97	982	98	995	100	32
South East Coast	31	4	277	31	762	86	846	96	864	98	877	99	39
South Central	129	15	561	64	828	95	860	99	863	99	871	100	25
South West	66	6	484	45	1017	94	1055	98	1066	99	1078	100	32
West Midlands	132	12	701	65	1021	95	1066	99	1070	99	1077	100	26
North West	102	7	740	54	1314	97	1351	99	1358	100	1360	100	29
Wales	87	15	386	66	564	97	576	99	578	99	581	100	25
Northern Ireland	77	48	136	86	157	99	159	100	159	100	159	100	15
Scotland	98	14	333	48	643	92	668	96	677	97	691	99	31
United Kingdom	**1040**	**10**	**6057**	**56**	**10240**	**94**	**10653**	**98**	**10734**	**99**	**10819**	**100**	**29**

Table 100 : Time from final surgery to radiotherapy													
	≤ 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	14	2	161	18	313	35	480	54	812	91	112
East Midlands	0	0	9	1	305	47	521	80	551	85	615	95	62
East of England	5	1	22	3	340	54	503	80	545	86	586	93	58
London	4	1	19	3	260	35	494	66	568	76	681	91	70
South East Coast	1	0	6	1	71	17	153	37	221	54	366	89	113
South Central	0	0	14	2	158	26	352	57	442	72	560	91	83
South West	2	0	6	1	187	23	549	68	632	78	737	91	76
West Midlands	2	0	13	2	312	38	598	73	647	79	718	88	68
North West	2	0	25	3	259	31	492	59	665	80	748	90	83
Wales	0	0	1	0	139	33	263	62	313	74	370	87	74
Northern Ireland	1	1	6	5	40	34	91	76	100	84	112	94	69
Scotland	2	0	10	2	216	43	373	73	407	80	466	92	64
United Kingdom	**19**	**0**	**145**	**2**	**2448**	**33**	**4702**	**63**	**5571**	**75**	**6771**	**91**	**75**

Table 101 : Time from assessment to radiotherapy													
	≤ 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	0	0	22	2	147	16	299	33	704	79	147
East Midlands	0	0	0	0	19	3	273	42	462	71	564	86	96
East of England	0	0	0	0	67	11	312	49	478	75	567	89	91
London	0	0	2	0	22	3	201	27	414	55	602	80	114
South East Coast	0	0	0	0	2	0	41	10	98	24	291	70	162
South Central	0	0	0	0	31	5	172	28	318	52	502	82	119
South West	0	0	0	0	13	2	153	19	423	52	664	82	119
West Midlands	0	0	0	0	44	5	297	36	535	65	673	82	102
North West	0	0	1	0	47	6	217	26	455	55	724	87	115
Wales	0	0	0	0	13	3	156	36	256	59	351	81	104
Northern Ireland	1	1	2	2	13	11	45	38	87	73	107	90	96
Scotland	0	0	3	1	15	3	168	33	313	61	432	84	105
United Kingdom	**1**	**0**	**8**	**0**	**308**	**4**	**2182**	**29**	**4138**	**55**	**6181**	**83**	**113**

Table 102 : 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	1099	76	22	2	320	22	2	0	1443	100
East Midlands	800	78	7	1	211	21	5	0	1023	100
East of England	658	77	13	2	178	21	1	0	850	100
London	850	81	22	2	174	17	1	0	1047	100
South East Coast	572	71	21	3	215	27	2	0	810	100
South Central	742	81	2	0	168	18	1	0	913	100
South West	910	78	5	0	252	22	1	0	1168	100
West Midlands	924	80	14	1	212	18	0	0	1150	100
North West	1113	78	26	2	278	20	1	0	1418	100
Wales	491	85	3	1	86	15	0	0	580	100
Northern Ireland	116	78	0	0	33	22	0	0	149	100
Scotland	605	80	7	1	140	19	0	0	752	100
United Kingdom	**8880**	**79**	**142**	**1**	**2267**	**20**	**14**	**0**	**11303**	**100**

Table 103 : 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	731	67	354	32	14	1	0	0	1099	100
East Midlands	533	67	255	32	12	2	0	0	800	100
East of England	521	79	127	19	10	2	0	0	658	100
London	638	75	186	22	25	3	1	0	850	100
South East Coast	419	73	145	25	8	1	0	0	572	100
South Central	545	73	191	26	6	1	0	0	742	100
South West	702	77	208	23	0	0	0	0	910	100
West Midlands	690	75	230	25	4	0	0	0	924	100
North West	775	70	329	30	9	1	0	0	1113	100
Wales	353	72	127	26	11	2	0	0	491	100
Northern Ireland	86	74	30	26	0	0	0	0	116	100
Scotland	414	68	183	30	6	1	2	0	605	100
United Kingdom	**6407**	**72**	**2365**	**27**	**105**	**1**	**3**	**0**	**8880**	**100**

Table 104 : Radiotherapy for invasive cancers treated by conservation surgery						
	Radiotherapy		No radiotherapy		Total	
Region	No.	%	No.	%	No.	%
N East, Yorks & Humber	664	91	67	9	731	100
East Midlands	509	95	24	5	533	100
East of England	497	95	24	5	521	100
London	592	93	46	7	638	100
South East Coast	324	77	95	23	419	100
South Central	497	91	48	9	545	100
South West	658	94	44	6	702	100
West Midlands	634	92	56	8	690	100
North West	661	85	114	15	775	100
Wales	346	98	7	2	353	100
Northern Ireland	83	97	3	3	86	100
Scotland	379	92	35	8	414	100
United Kingdom	**5844**	**91**	**563**	**9**	**6407**	**100**

Table 105 : Invasive size of invasive cases treated by conservation without radiotherapy												
	<15mm		15-<20mm		20-<50mm		50+mm		Unknown		Total	
Region	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	49	73	8	12	8	12	1	1	1	1	67	100
East Midlands	18	75	3	13	1	4	0	0	2	8	24	100
East of England	20	83	2	8	2	8	0	0	0	0	24	100
London	24	52	14	30	3	7	3	7	2	4	46	100
South East Coast	63	66	21	22	8	8	0	0	3	3	95	100
South Central	34	71	7	15	7	15	0	0	0	0	48	100
South West	28	64	7	16	8	18	1	2	0	0	44	100
West Midlands	36	64	13	23	6	11	0	0	1	2	56	100
North West	71	62	19	17	20	18	2	2	2	2	114	100
Wales	3	43	2	29	2	29	0	0	0	0	7	100
Northern Ireland	1	33	0	0	2	67	0	0	0	0	3	100
Scotland	25	71	5	14	3	9	0	0	2	6	35	100
United Kingdom	**372**	**66**	**101**	**18**	**70**	**12**	**7**	**1**	**13**	**2**	**563**	**100**

Table 106 : Radiotherapy for non-invasive cancers treated by conservation surgery						
	Radiotherapy		No radiotherapy		Total	
Region	No.	%	No.	%	No.	%
N East, Yorks & Humber	120	55	97	45	217	100
East Midlands	65	51	63	49	128	100
East of England	80	56	64	44	144	100
London	71	55	57	45	128	100
South East Coast	49	33	101	67	150	100
South Central	47	38	77	62	124	100
South West	79	41	112	59	191	100
West Midlands	88	58	65	42	153	100
North West	80	41	115	59	195	100
Wales	39	60	26	40	65	100
Northern Ireland	20	83	4	17	24	100
Scotland	64	65	35	35	99	100
United Kingdom	**802**	**50**	**816**	**50**	**1618**	**100**

Table 107 : Cytonuclear grade of non-invasive cancers treated by conservation without radiotherapy										
	High		Other		Not assessable		Unknown		Total	
Region	No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	19	20	76	78	0	0	2	2	97	100
East Midlands	19	30	35	56	5	8	4	6	63	100
East of England	14	22	49	77	1	2	0	0	64	100
London	9	16	40	70	4	7	4	7	57	100
South East Coast	31	31	60	59	5	5	5	5	101	100
South Central	36	47	39	51	2	3	0	0	77	100
South West	42	38	64	57	1	1	5	4	112	100
West Midlands	24	37	39	60	1	2	1	2	65	100
North West	32	28	78	68	2	2	3	3	115	100
Wales	2	8	24	92	0	0	0	0	26	100
Northern Ireland	0	0	4	100	0	0	0	0	4	100
Scotland	0	0	32	91	3	9	0	0	35	100
United Kingdom	**228**	**28**	**540**	**66**	**24**	**3**	**24**	**3**	**816**	**100**

Table 108: Size of non-invasive cancers treated by conservation without radiotherapy												
	<15mm		15-<30mm		30+mm		Not assessable		Unknown		Total	
Region	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	56	58	19	20	10	10	7	7	5	5	97	100
East Midlands	38	60	14	22	4	6	4	6	3	5	63	100
East of England	41	64	9	14	1	2	12	19	1	2	64	100
London	28	49	9	16	7	12	1	2	12	21	57	100
South East Coast	59	58	21	21	4	4	8	8	9	9	101	100
South Central	42	55	26	34	5	6	1	1	3	4	77	100
South West	77	69	19	17	6	5	0	0	10	9	112	100
West Midlands	45	69	14	22	3	5	1	2	2	3	65	100
North West	68	59	22	19	9	8	1	1	15	13	115	100
Wales	14	54	5	19	1	4	0	0	6	23	26	100
Northern Ireland	4	100	0	0	0	0	0	0	0	0	4	100
Scotland	26	74	6	17	3	9	0	0	0	0	35	100
United Kingdom	**498**	**61**	**164**	**20**	**53**	**6**	**35**	**4**	**66**	**8**	**816**	**100**

Table 109 : 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	93	6	31	2	1011	68	23	2	323	22	2	0	1483	100
East Midlands	62	6	17	2	726	71	7	1	211	21	5	0	1028	100
East of England	49	6	8	1	628	72	12	1	179	20	1	0	877	100
London	56	5	16	2	788	75	20	2	173	16	0	0	1053	100
South East Coast	51	5	16	2	646	67	20	2	230	24	2	0	965	100
South Central	50	5	26	3	682	73	2	0	169	18	1	0	930	100
South West	57	5	24	2	825	71	5	0	242	21	1	0	1154	100
West Midlands	50	5	22	2	757	74	12	1	179	18	0	0	1020	100
North West	64	5	29	2	998	73	26	2	258	19	1	0	1376	100
Wales	34	6	10	2	445	77	3	1	83	14	0	0	575	100
Northern Ireland	3	2	10	7	108	71	0	0	31	20	0	0	152	100
Scotland	31	4	13	2	572	75	7	1	141	18	0	0	764	100
United Kingdom	**600**	**5**	**222**	**2**	**8186**	**72**	**137**	**1**	**2219**	**20**	**13**	**0**	**11377**	**100**

Table 110 : Chemotherapy for ER negative node positive invasive cancers						
	Chemotherapy		No chemotherapy		Total	
Region	No.	%	No.	%	No.	%
N East, Yorks & Humber	26	84	5	16	31	100
East Midlands	17	100	0	0	17	100
East of England	7	88	1	13	8	100
London	13	81	3	19	16	100
South East Coast	14	88	2	13	16	100
South Central	20	77	6	23	26	100
South West	21	88	3	13	24	100
West Midlands	20	91	2	9	22	100
North West	23	79	6	21	29	100
Wales	10	100	0	0	10	100
Northern Ireland	9	90	1	10	10	100
Scotland	13	100	0	0	13	100
United Kingdom	**193**	**87**	**29**	**13**	**222**	**100**

Table 111 : Chemotherapy for ER negative node negative invasive cancers						
	Chemotherapy		No chemotherapy		Total	
Region	No.	%	No.	%	No.	%
N East, Yorks & Humber	38	41	55	59	93	100
East Midlands	26	42	36	58	62	100
East of England	21	43	28	57	49	100
London	29	52	27	48	56	100
South East Coast	20	39	31	61	51	100
South Central	12	24	38	76	50	100
South West	24	42	33	58	57	100
West Midlands	27	54	23	46	50	100
North West	24	38	40	63	64	100
Wales	17	50	17	50	34	100
Northern Ireland	2	67	1	33	3	100
Scotland	21	68	10	32	31	100
United Kingdom	**261**	**44**	**339**	**57**	**600**	**100**

Table 112 : 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	2	5	36	95	0	0	38	100
East Midlands	1	4	1	4	24	92	0	0	26	100
East of England	0	0	6	29	15	71	0	0	21	100
London	1	3	4	14	24	83	0	0	29	100
South East Coast	0	0	7	35	13	65	0	0	20	100
South Central	0	0	1	8	11	92	0	0	12	100
South West	0	0	5	21	18	75	1	4	24	100
West Midlands	0	0	6	22	21	78	0	0	27	100
North West	0	0	5	21	19	79	0	0	24	100
Wales	0	0	3	18	14	82	0	0	17	100
Northern Ireland	0	0	1	50	1	50	0	0	2	100
Scotland	0	0	1	5	20	95	0	0	21	100
United Kingdom	**2**	**1**	**42**	**16**	**216**	**83**	**1**	**0**	**261**	**100**

Table 113 : ER status of all cases with complete hormone therapy data								
	Positive		Negative		Unknown		Total	
Region	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	965	69	171	12	253	18	1389	100
East Midlands	768	76	109	11	133	13	1010	100
East of England	654	76	72	8	138	16	864	100
London	816	77	106	10	134	13	1056	100
South East Coast	615	76	83	10	110	14	808	100
South Central	689	77	98	11	105	12	892	100
South West	865	81	116	11	88	8	1069	100
West Midlands	828	82	99	10	81	8	1008	100
North West	1128	82	159	12	84	6	1371	100
Wales	510	85	50	8	43	7	603	100
Northern Ireland	134	84	18	11	7	4	159	100
Scotland	673	88	66	9	25	3	764	100
United Kingdom	**8645**	**79**	**1147**	**10**	**1201**	**11**	**10993**	**100**

Table 114 : 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	923	96	3	0	39	4	0	0	965	100
East Midlands	703	92	3	0	62	8	0	0	768	100
East of England	607	93	9	1	38	6	0	0	654	100
London	738	90	7	1	70	9	1	0	816	100
South East Coast	539	88	7	1	68	11	1	0	615	100
South Central	621	90	2	0	66	10	0	0	689	100
South West	768	89	3	0	93	11	1	0	865	100
West Midlands	731	88	3	0	94	11	0	0	828	100
North West	977	87	13	1	138	12	0	0	1128	100
Wales	475	93	1	0	34	7	0	0	510	100
Northern Ireland	114	85	0	0	20	15	0	0	134	100
Scotland	568	84	4	1	101	15	0	0	673	100
United Kingdom	**7764**	**90**	**55**	**1**	**823**	**10**	**3**	**0**	**8645**	**100**

Table 115 : Hormone therapy for ER positive invasive cancers						
	Hormone therapy		No hormone therapy		Total	
Region	No.	%	No.	%	No.	%
N East, Yorks & Humber	911	99	12	1	923	100
East Midlands	613	87	90	13	703	100
East of England	556	92	51	8	607	100
London	699	95	39	5	738	100
South East Coast	511	95	28	5	539	100
South Central	523	84	98	16	621	100
South West	756	98	12	2	768	100
West Midlands	725	99	6	1	731	100
North West	872	89	105	11	977	100
Wales	421	89	54	11	475	100
Northern Ireland	113	99	1	1	114	100
Scotland	556	98	12	2	568	100
United Kingdom	**7256**	**93**	**508**	**7**	**7764**	**100**

Table 116 : Hormone therapy for ER negative, PgR positive invasive cancers						
	Hormone therapy		No hormone therapy		Total	
Region	No.	%	No.	%	No.	%
N East, Yorks & Humber	5	83	1	17	6	100
East Midlands	2	40	3	60	5	100
East of England	1	33	2	67	3	100
London	5	83	1	17	6	100
South East Coast	2	100	0	0	2	100
South Central	4	44	5	56	9	100
South West	2	100	0	0	2	100
West Midlands	3	50	3	50	6	100
North West	4	67	2	33	6	100
Wales	1	100	0	0	1	100
Northern Ireland	0	-	0	-	0	-
Scotland	0	-	0	-	0	-
United Kingdom	**29**	**63**	**17**	**37**	**46**	**100**

Table 117 : Hormone therapy for all ER negative cancers						
	Hormone therapy		No hormone therapy		Total	
Region	No.	%	No.	%	No.	%
N East, Yorks & Humber	8	5	163	95	171	100
East Midlands	6	6	103	94	109	100
East of England	2	3	70	97	72	100
London	15	14	91	86	106	100
South East Coast	12	14	71	86	83	100
South Central	21	21	77	79	98	100
South West	7	6	109	94	116	100
West Midlands	4	4	95	96	99	100
North West	12	8	147	92	159	100
Wales	4	8	46	92	50	100
Northern Ireland	1	6	17	94	18	100
Scotland	1	2	65	98	66	100
United Kingdom	**93**	**8**	**1054**	**92**	**1147**	**100**

Table 118 : 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	22	7	0	0	8	2	30	9
East Midlands	57	27	0	0	11	5	68	32
East of England	8	4	0	0	3	2	11	6
London	30	17	2	1	4	2	36	20
South East Coast	51	22	4	2	2	1	57	25
South Central	32	18	1	1	2	1	35	20
South West	35	14	1	0	1	0	37	15
West Midlands	42	20	1	0	2	1	45	21
North West	99	35	3	1	2	1	104	37
Wales	19	21	0	0	1	1	20	22
Northern Ireland	17	47	0	0	1	3	18	50
Scotland	36	26	0	0	0	0	36	26
United Kingdom	**448**	**19**	**12**	**1**	**37**	**2**	**497**	**21**

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

Table 119: Hormone therapy for ER positive non-invasive cancers						
	Hormone therapy		No hormone therapy		Total	
Region	No.	%	No.	%	No.	%
N East, Yorks & Humber	22	56	17	44	39	100
East Midlands	57	92	5	8	62	100
East of England	8	21	30	79	38	100
London	30	43	40	57	70	100
South East Coast	51	75	17	25	68	100
South Central	32	48	34	52	66	100
South West	35	38	58	62	93	100
West Midlands	42	45	52	55	94	100
North West	99	72	39	28	138	100
Wales	19	56	15	44	34	100
Northern Ireland	17	85	3	15	20	100
Scotland	36	36	65	64	101	100
United Kingdom	**448**	**54**	**375**	**46**	**823**	**100**

Table 120 : Chemotherapy for ER negative invasive cancers with PgR negative						
	Chemotherapy		No Chemotherapy		Total	
Region	No.	%	No.	%	No.	%
N East, Yorks & Humber	46	47	52	53	98	100
East Midlands	18	47	20	53	38	100
East of England	18	53	16	47	34	100
London	41	57	31	43	72	100
South East Coast	35	53	31	47	66	100
South Central	27	39	42	61	69	100
South West	34	57	26	43	60	100
West Midlands	42	68	20	32	62	100
North West	46	49	48	51	94	100
Wales	24	62	15	38	39	100
Northern Ireland	2	67	1	33	3	100
Scotland	34	81	8	19	42	100
United Kingdom	**367**	**54**	**310**	**46**	**677**	**100**

Table 121 : Chemotherapy for HER-2 positive invasive cancers								
	Chemotherapy		No Chemotherapy		Unknown Chemotherapy		Total	
Region	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	20	59	14	41	0	0	34	100
East Midlands	4	100	0	0	0	0	4	100
East of England	23	64	13	36	0	0	36	100
London	31	45	36	52	2	3	69	100
South East Coast	4	29	10	71	0	0	14	100
South Central	20	48	21	50	1	2	42	100
South West	50	42	68	57	2	2	120	100
West Midlands	18	64	6	21	4	14	28	100
North West	40	40	58	58	2	2	100	100
Wales	12	43	16	57	0	0	28	100
Northern Ireland	4	44	5	56	0	0	9	100
Scotland	44	51	43	49	0	0	87	100
United Kingdom	**270**	**47**	**290**	**51**	**11**	**2**	**571**	**100**

APPENDIX G

DATA OBTAINED FROM THE SURVIVAL AUDIT OF SCREEN DETECTED BREAST CANCERS FOR CANCERS DIAGNOSED BETWEEN 1 APRIL 2000 AND 31 MARCH 2001

Table 122 : Cause of death of eligible invasive cancers with death before 31/03/2006

Region	Breast Cancer*		Other cancer		Non-cancer		Not Collected		Unknown		Total deaths		Total cancers
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	
N East, Yorks & Humber	58	73	9	11	11	14	0	0	1	1	79	8	996
East Midlands	40	71	6	11	8	14	0	0	2	4	56	9	608
East of England	41	72	3	5	11	19	0	0	2	4	57	8	697
London	28	64	4	9	12	27	0	0	0	0	44	6	707
South East Coast	37	70	5	9	11	21	0	0	0	0	53	9	620
South Central	33	67	4	8	12	24	0	0	0	0	49	9	554
South West	45	80	2	4	7	13	0	0	2	4	56	8	683
West Midlands	37	64	9	16	12	21	0	0	0	0	58	9	657
North West	48	65	6	8	20	27	0	0	0	0	74	9	861
Wales	23	61	2	5	13	34	0	0	0	0	38	9	430
Northern Ireland	11	85	0	0	2	15	0	0	0	0	13	7	194
United Kingdom	**401**	**69**	**50**	**9**	**119**	**21**	**0**	**0**	**7**	**1**	**577**	**8**	**7007**

* Death from the screen detected breast cancer

Table 123 : Cause of death of eligible micro-invasive cancers with death before 31/03/2006

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	0	17
East Midlands	0	-	0	-	0	-	0	-	0	-	0	0	15
East of England	1	100	0	0	0	0	0	0	0	0	1	7	14
London	2	100	0	0	0	0	0	0	0	0	2	8	26
South East Coast	1	100	0	0	0	0	0	0	0	0	1	9	11
South Central	0	-	0	-	0	-	0	-	0	-	0	0	6
South West	0	-	0	-	0	-	0	-	0	-	0	0	3
West Midlands	0	-	0	-	0	-	0	-	0	-	0	0	7
North West	0	-	0	-	0	-	0	-	0	-	0	0	10
Wales	0	0	0	0	1	100	0	0	0	0	1	13	8
Northern Ireland	0	-	0	-	0	-	0	-	0	-	0	0	2
United Kingdom	**4**	**80**	**0**	**0**	**1**	**20**	**0**	**0**	**0**	**0**	**5**	**4**	**119**

* Death from the screen detected breast cancer

Table 124 : Cause of death of eligible non-invasive cancers with death before 31/03/2006

Region	Breast Cancer*		Other cancer		Non-cancer		Not Collected		Unknown		Total deaths		Total cancers
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	
N East, Yorks & Humber	6	67	1	11	2	22	0	0	0	0	9	4	232
East Midlands	2	100	0	0	0	0	0	0	0	0	2	1	169
East of England	1	33	1	33	1	33	0	0	0	0	3	2	164
London	3	43	2	29	2	29	0	0	0	0	7	4	174
South East Coast	4	44	3	33	1	11	0	0	1	11	9	6	148
South Central	1	20	1	20	2	40	0	0	1	20	5	4	118
South West	6	75	1	13	1	13	0	0	0	0	8	4	194
West Midlands	0	0	3	100	0	0	0	0	0	0	3	2	125
North West	0	0	2	29	5	71	0	0	0	0	7	4	200
Wales	0	0	2	50	2	50	0	0	0	0	4	3	122
Northern Ireland	1	100	0	0	0	0	0	0	0	0	1	2	42
United Kingdom	**24**	**41**	**16**	**28**	**16**	**28**	**0**	**0**	**2**	**3**	**58**	**3**	**1688**

* Death from the screen detected breast cancer

Table 125 : 5 year relative survival by region – primary invasive cancers only			
Region	**1998/99**	**1999/00**	**2000/01**
N East, Yorks & Humber	94.3 (92.3,96.4)	97.3 (95.7,99.0)	96.4 (94.7,98.1)
East Midlands	95.4 (92.8,98.0)	95.9 (93.5,98.4)	95.8 (93.4,98.1)
East of England	97.4 (95.3,99.5)	96.6 (94.4,98.7)	97.1 (95.0,99.2)
London	97.2 (95.1,99.3)	96.1 (94.0,98.3)	98.1 (96.2,100.0)
South East Coast	96.4 (94.0,98.7)	96.4 (94.1,98.8)	97.0 (94.8,99.2)
South Central	96.7 (94.5,99.0)	96.7 (94.3,99.2)	96.4 (94.0,98.8)
South West	97.6 (95.6,99.6)	97.4 (95.5,99.3)	95.9 (93.7,98.1)
West Midlands	95.4 (93.0,97.8)	94.2 (91.8,96.6)	95.6 (93.3,97.8)
North West	94.6 (92.4,96.8)	97.5 (95.7,99.4)	95.6 (93.7,97.6)
Wales	95.3 (92.2,98.4)	96.1 (93.3,98.9)	95.9 (93.0,98.7)
Northern Ireland	92.1 (86.3,97.8)	93.8 (89.1,98.4)	96.6 (92.9,100.4)
Scotland	94.4 (91.8,97.1)	-	-
United Kingdom	**95.8 (95.1,96.5)**	**96.5 (95.8,97.2)**	**96.4 (95.7,97.0)**

Table 126 : 5 year relative survival by age for primary invasive cancers			
Age	**1998/99**	**1999/00**	**2000/01**
<50	93.1 (88.5,97.7)	94.6 (90.3,99.0)	94.0 (89.5,98.5)
50-52	96.4 (95.2,97.6)	96.1 (94.8,97.4)	96.2 (94.9,97.4)
53-55	92.9 (91.1,94.8)	95.2 (93.6,96.9)	94.9 (93.3,96.5)
56-58	93.8 (92.0,95.7)	95.4 (93.7,97.0)	96.4 (94.9,98.0)
59-61	95.7 (94.1,97.4)	95.8 (94.1,97.5)	96.1 (94.4,97.8)
62-64	96.0 (94.2,97.8)	96.1 (94.3,97.9)	95.5 (93.6,97.3)
65+	100.9 (98.7,103.1)	101.6 (99.5,103.8)	100.1 (97.9,102.2)
All invasive cancers	**95.8 (95.1,96.5)**	**96.5 (95.8,97.2)**	**96.4 (95.7,97.0)**

Table 127 : 5 year relative survival by invasive size for primary invasive cancers			
Size	**1998/99**	**1999/00**	**2000/01**
<10mm	99.4 (98.3,100.5)	99.8 (98.7,100.9)	100.3 (99.3,101.3)
10-<20mm	97.4 (96.5,98.3)	98.6 (97.8,99.4)	97.5 (96.6,98.3)
20-<49mm	90.5 (88.7,92.3)	90.4 (88.7,92.2)	92.1 (90.4,93.7)
50+mm	81.2 (72.4,90.0)	73.8 (64.0,83.6)	80.9 (71.5,90.4)
Unknown	68.8 (56.1,81.4)	86.1 (75.8,96.5)	67.8 (54.7,80.9)
All invasive cancers	**95.8 (95.1,96.5)**	**96.5 (95.8,97.2)**	**96.4 (95.7,97.0)**

Table 128 : 5 year relative survival by grade for primary invasive cancers			
Grade	**1998/99**	**1999/00**	**2000/01**
I	100.2 (99.4,101.0)	101.0 (100.2,101.8)	99.7 (98.8,100.6)
II	96.1 (95.1,97.1)	97.1 (96.2,98.1)	97.7 (96.8,98.6)
III	86.7 (84.4,89.0)	87.2 (85.0,89.4)	86.7 (84.4,89.0)
Unknown	99.1 (93.5,104.7)	96.3 (88.9,103.7)	100.4 (96.4,104.4)
All invasive cancers	**95.8 (95.1,96.5)**	**96.5 (95.8,97.2)**	**96.4 (95.7,97.0)**

Table 129 : 5 year relative survival by nodal status for primary invasive cancers			
Nodal status	**1998/99**	**1999/00**	**2000/01**
Positive	89.3 (87.5,91.2)	88.0 (86.1,89.9)	89.2 (87.4,91.0)
Negative	98.2 (97.4,98.9)	99.2 (98.5,99.8)	99.0 (98.3,99.6)
Unknown	95.4 (93.2,97.7)	98.6 (96.2,101.1)	95.0 (92.3,97.8)
All invasive cancers	**95.8 (95.1,96.5)**	**96.5 (95.8,97.2)**	**96.4 (95.7,97.0)**

Table 130 : 5 year relative survival by NPI prognostic group for primary invasive cancers			
NPI group	**1998/99**	**1999/00**	**2000/01**
EPG	100.4 (99.4,101.3)	101.1 (100.2,102.0)	100.2 (99.2,101.2)
GPG	98.7 (97.7,99.8)	100.2 (99.3,101.1)	99.1 (98.1,100.1)
MPG1	94.7 (93.1,96.4)	96.4 (94.9,98.0)	98.1 (96.8,99.4)
MPG2	89.3 (86.3,92.2)	88.7 (85.8,91.6)	89.6 (86.7,92.4)
PPG	74.8 (70.0,79.6)	70.5 (65.7,75.3)	71.2 (66.2,76.2)
Unknown	95.1 (92.7,97.6)	97.8 (95.6,99.9)	96.0 (93.8,98.1)
All invasive cancers	**95.8 (95.1,96.5)**	**96.5 (95.8,97.2)**	**96.4 (95.7,97.0)**

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