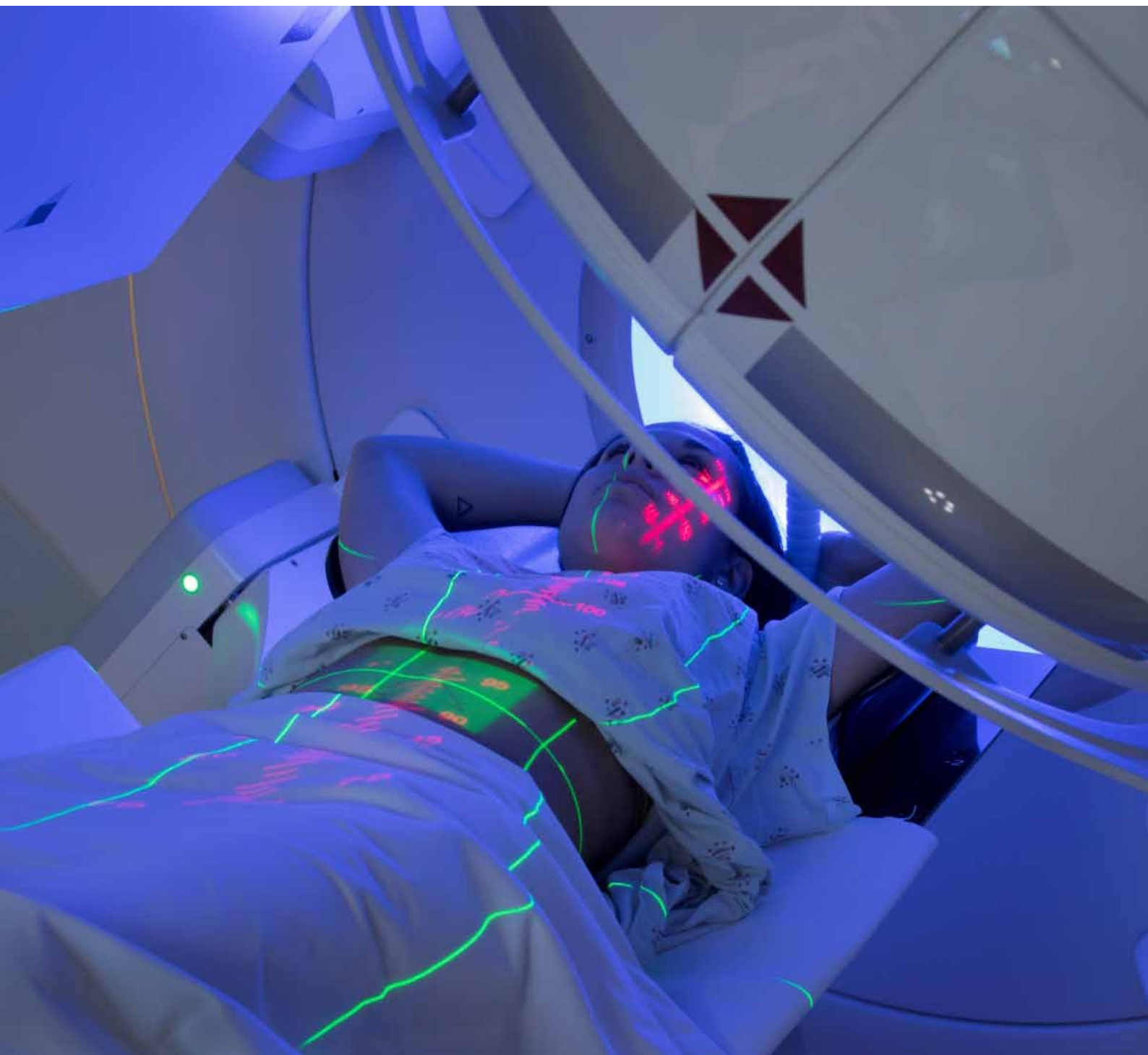


# National Bowel Cancer Audit

Annual Report 2016 Version 2



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This 2016 Annual Report contains data from the 2014-2015 reporting period which covers patients in England and Wales with a date of diagnosis of bowel cancer from 1 April 2014 to 31 March 2015.

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**The Association of Coloproctology of Great Britain and Ireland (ACPGBI)** is the professional body that represents UK colorectal surgeons. ACPGBI assisted in the clinical interpretation of the data presented in the 2016 Annual Report.



**The Royal College of Surgeons of England (RCS)** is an independent professional body committed to enabling surgeons to achieve and maintain the highest standards of surgical practice and patient care. The project team based in the Clinical Effectiveness Unit (CEU) at the RCS carried out the analysis of the data for the 2016 Annual Report.



**NHS Digital** is the new trading name for the Health and Social Care Information Centre (HSCIC). They provide 'Information and Technology for better health and care'. The Clinical Audit and Registries Management Service of NHS Digital manages a number of national clinical audits in the areas of cancer, diabetes and heart disease. It manages the audit on behalf of the RCS.



**The Healthcare Quality Improvement Partnership (HQIP)** is led by a consortium of the Academy of Medical Royal Colleges, the Royal College of Nursing and National Voices. It aims to promote quality improvement, and in particular to increase the impact that clinical audit has on healthcare quality in England and Wales. HQIP holds the contract to manage and develop the National Clinical Audit Programme, comprising more than 30 clinical audits that cover care provided to people with a wide range of medical, surgical and mental health conditions. The programme is funded by NHS England, the Welsh Government and, with some individual audits, also funded by the Health Department of the Scottish Government, DHSSPS Northern Ireland and the Channel Islands.  
[www.hqip.org.uk](http://www.hqip.org.uk)

# National Bowel Cancer Audit Annual Report 2016

Version 2

An audit of the care received  
by people with Bowel Cancer  
in England and Wales  
2016 Annual Report

Version 2 note:

Table 7.3 (page 59) has been revised to correct an error in the data relating to three trusts.

These are indicated with an asterisk (\*)

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# Acknowledgements

The National Bowel Cancer Audit (NBOCA), commissioned by the Healthcare Quality Improvement Partnership (HQIP), has been developed by the Association of Coloproctology of Great Britain and Ireland (ACPGBI). It is managed by the Clinical Audit and Registries Management Service within NHS Digital on behalf of the Clinical Effectiveness Unit (CEU) of the Royal College of Surgeons of England.

The data for Wales has been supplied by the Cancer Information System Cymru (CaNISC).

RTDS data taken from the Radiotherapy Dataset NATCANSAT © 2015.

The analyses and writing for this report were carried out by the CEU of the Royal College of Surgeons of England with support from NHS Digital, Michael Braun and Jim Hill from the ACPGBI.

The Project Team and Board would like to thank the clinical and non-clinical staff at all National Health Service (NHS) trusts and Welsh health boards who collected and submitted data to the audit for their hard work, support and leadership.

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## Foreword

This annual report from the National Bowel Cancer Audit is the most up to date information from England and Wales regarding the care and outcomes of bowel cancer patients. The report reflects an enormous amount of hard work in collecting, analysing and interpreting a mass of data and I am extremely grateful to all those individuals involved – trusts, Welsh health boards, NHS Digital and the Clinical Effectiveness Unit at the Royal College of Surgeons of England.

The National Bowel Cancer Audit has previously concentrated on patients undergoing major resection for their bowel cancer and has under-represented patients who do not undergo major surgery. The audit has continued to widen its scope and now describes patients with early rectal cancers undergoing a local excision and those with too much disease or co-morbidity for a major resection. Only through complete and accurate data can processes and outcomes of care be described for all patients with bowel cancer. The audit also reinforces the importance of promoting the NHS bowel cancer screening programme.

The value of the annual report remains dependent on the quality of data submitted by the contributing multi-disciplinary teams (MDT). The clinical ownership and oversight of the data submitted by each trust is crucial. Data quality in the audit continues to improve, representing increasing consultant engagement. The Clinical Audit Platform allows clinician scrutiny of the MDT data upload by providing clear access to the data entered.

The patient and their family remain at the centre of bowel cancer care. It remains our responsibility to provide accurate and up to date information to those diagnosed and undergoing treatment for bowel cancer. We are more than familiar with the sensible and practical questions routinely asked by our patients, commonly relating to the risks of dying from an operation, the recovery from surgery, the chance of long-term cure and the potential need for a stoma bag.

Recent important judgements on informed consent have highlighted the need for the patient to understand this information. We hope that audit data will assist care providers in accurately answering these important questions. To improve accessibility of the 2016 Annual Report to patients, an individual patient report has, for the first time this year, been produced. The report summarises the key results in a patient-friendly format.

Further work needs to be done to fully describe the quality of care and outcomes for patients with bowel cancer in England and Wales. I am very proud of this well established National Cancer Audit, and excited about the potential for development of the audit in the years to come.



A handwritten signature in black ink that reads "Peter Dawson". The signature is written in a cursive style and is underlined with a single horizontal stroke.

**Peter Dawson**  
**President, Association of Coloproctology  
of Great Britain and Ireland**

# 1. Executive summary

## Audit background

Bowel cancer is a major cause of illness, disability and death in the United Kingdom (UK). The National Bowel Cancer Audit (NBOCA) describes and compares the care and outcomes of patients diagnosed with bowel cancer in England and Wales. The audit is now well established and has collected data in its professional form since 2005.

The NBOCA is commissioned by the Healthcare Quality Improvement Partnership (HQIP) and funded by NHS England and Welsh Government. The audit is carried out by the Clinical Effectiveness Unit (CEU) of the Royal College of Surgeons of England in partnership with the Association of Coloproctology of Great Britain and Ireland (ACPGBI), and NHS Digital.

The 2016 Annual Report is the seventh report produced by the above collaborative and includes data on over 30,000 patients diagnosed with bowel cancer between 1 April 2014 and 31 March 2015. The overall case ascertainment for England was 93 per cent.

The key audience of the Annual Report and the Patient Report include those who deliver care to bowel cancer patients, commissioners of bowel cancer services and patients.

## Audit aims

The aim of the audit is to measure the quality of care and outcomes of patients with CRC in England and Wales.

## What the audit measures

The NBOCA collects data on items which have been identified and generally accepted as measures of good care. It compares the variation in these between strategic clinical networks and trusts/hospital sites. A summary of the performance indicators measured in patients with bowel cancer is available at: [www.digital.nhs.uk/bowel](http://www.digital.nhs.uk/bowel). The majority of data items are collected by NHS trusts in England as part of the Cancer Outcomes and Services Dataset (COSD)<sup>1</sup>. Risk-adjusted outcomes reported include: 90-day post-operative mortality, 30-day unplanned readmission rate, two-year mortality for patients having major resection and 18-month stoma rate.

## Clinical Outcomes Publication

The NBOCA publishes data at individual surgeon level and trust level for English NHS trusts. This information is available on the ACPGBI, NHS Choices and MyNHS websites as part of the Clinical Outcomes Publication (COP) programme. The COP programme represents an ambitious endeavour aimed to improve transparency around clinical outcomes.

The total number of cases and the 90-day post-operative mortality rate, for patients undergoing elective/scheduled major surgery following a diagnosis of bowel cancer between 1 April 2010 and 31 March 2015, are currently reported at both surgeon and trust level.

In addition, the proportion of patients undergoing major resection and the case ascertainment (as shown in [Table 7.1](#) of this annual report) will now be reported for all patients with bowel cancer (emergency and elective) treated in the corresponding audit period at a trust/hospital level.

The results are available at: [www.acpgbi.org.uk/surgeon-outcomes/](http://www.acpgbi.org.uk/surgeon-outcomes/).

## Key findings and recommendations

### Chapter 3 – Care pathways

- **Patients diagnosed through the NHS screening programme were more likely to be treated with curative intent than patients diagnosed via other means**

88 per cent of patients diagnosed via the NHS bowel screening programme were treated with curative intent compared to 52 per cent and 69 per cent of patients diagnosed from an emergency presentation and GP referral respectively.

- **75 per cent of all patients diagnosed with bowel cancer were treated with curative intent**  
93 per cent of these patients underwent a major resection and 7 per cent underwent endoscopic or minimally invasive local excision.
- **25 per cent of patients were treated with palliative intent**  
31 per cent of these patients underwent a major resection of the bowel cancer primary or a palliative surgical procedure (the majority being stoma formation or stent).

#### Recommendations

- The contribution of the NHS bowel cancer screening programme to the diagnosis of patients with early bowel cancer is demonstrated. All health professionals should be encouraged to actively promote participation in this service to increase service uptake.
- Clinicians and data managers should prioritise data completeness for: reason for no treatment, performance status, care plan intent and pre-treatment M-stage. This will reduce the proportion of patients who do not undergo a major resection who are unassigned to a treatment pathway and therefore better describe the care and outcomes in this cohort.

### Chapter 4 – Surgical care

- **90-day survival after major resection continued to improve from 94.6 per cent in 2010-11 to 96.2 per cent in 2014-15**

90-day survival after planned surgery was 98 per cent and after emergency surgery was 88 per cent.

- **Length of hospital stay following surgery is stable**  
Median length of stay following major bowel cancer resection was seven days. Length of stay was highly variable between regions and the proportion of patients who remain in hospital for longer than five days after surgery ranged from 59 to 81 per cent across strategic clinical networks.
- **One in ten patients had an unplanned readmission to hospital within 30-days of surgery**  
There was no more variation between regions in rates of 30-day unplanned readmission than would be expected by chance alone.
- **Over 50 per cent of patients had a laparoscopic bowel cancer resection**

The proportion of major resections performed laparoscopically continued to increase year on year. There was no increase in the rate of unplanned conversion to open which has fallen from 9.0 per cent in 2013-14 to 8.5 per cent in 2014-15. The proportion of patients with laparoscopic completed resections ranged from 41 per cent to 68 per cent across strategic clinical networks.

#### Recommendations

- Improving the post-operative survival in patients undergoing emergency or urgent bowel cancer resection should remain a clinical priority. The provision of pre-operative resuscitation, adequate theatre access, post-operative critical care, and early colorectal team involvement, including full radiological support and facilities for colonic stenting as a bridge to curative surgery or expediting palliative chemotherapy, is likely to improve survival.
- Efforts to reduce long length of stay may need to be more focused on improving the provision of, and reducing any regional disparity in, community and primary care services (as described in the length of stay short report).
- Potential delays to discharge, particularly in the elderly population, should be considered pre-operatively, to allow for the provision of community services if required, to reduce the risk of prolonged length of hospital stay.

## Chapter 5 – Survival

- **Two-year survival rates for all patients diagnosed with bowel cancer has remained stable at 66 per cent since 2010**

There was a large variation in observed two-year patient survival according to strategic clinical network. This variation was more than would be expected by chance alone, however estimates are not adjusted for patient case-mix and there are many potential causes of this variation.

- **The trend of improving two-year survival rates in patients undergoing resection continues, with an increase from 80 per cent in 2009-10 to 82 per cent in 2012-13**

### Recommendations

- Further work is required into investigating regional variation in rates of two-year survival. This is a priority for the audit moving forward and access to the chemotherapy dataset and cause of death data will facilitate this.
- Patients presenting with stage IV bowel cancer should be referred to multi-disciplinary teams (MDTs) to optimise timing of resection of both the primary tumour and metastases as well as advising on neo-adjuvant and adjuvant treatment.

## Chapter 6 – Rectal cancer

- **37 per cent of patients undergoing a major resection for rectal cancer received neo-adjuvant radiotherapy**

Use of neo-adjuvant radiotherapy in patients undergoing major resection ranged from 29-66 per cent across strategic clinical networks.

- **83 per cent of rectal cancer patients had a stoma following major resection**

77 per cent of anterior resections were covered by a defunctioning stoma. Within 18 months, 66 per cent of these patients had undergone stoma reversal. There was significant variation in the rates of 18-month stoma between both strategic clinical networks and trusts.

### Recommendations

- In the future the audit will correlate radiotherapy use to rates of positive circumferential resection margins and local recurrence in rectal cancer patients undergoing major resection. To facilitate this, clinicians should aim to ensure complete data for circumferential resection margin.
- Clinicians should ensure that patients undergoing an anterior resection are aware that data suggests that in a significant proportion of patients a ‘temporary’ stoma may not be reversed within 18 months.

## New to the audit in 2016

### Radiotherapy dataset

The audit now links to the Radiotherapy Dataset. This has enabled more accurate information regarding the use of radiotherapy to be presented. It has also allowed a distinction to be made between the types of neo-adjuvant radiotherapy given (short course or long course) as well as the use of palliative radiotherapy.

### Individual reports for hospital trusts

A summary report describing the care and outcomes at each trust/hospital will be available shortly at [www.digital.nhs.uk/bowel](http://www.digital.nhs.uk/bowel). This reports data on a variety of processes and outcomes compared to network and national averages. Personalised trust/hospital PDF slides for use in presentations will also be available for the first time this year to aid discussion at the multi-disciplinary teams (MDT).

### Supplementary short reports

In the last year the NBOCA has published two short reports investigating regional variation in length of stay and rates of liver resection in patients with bowel cancer liver metastases. These are summarised on [pages 28 and 36](#) and the full reports are accessible at: <http://content.digital.nhs.uk/pubs/NBOCAShortReports2016>. Two further short reports on cancer specific mortality and time from completion of radiotherapy to surgery will be published in 2017.

### Patient report

To improve accessibility of the 2016 Annual Report to patients, a separate patient report has, for the first time this year, been produced. The report summarises the key results in a patient-friendly format. Consequently, the main 2016 Annual Report is more concise than in previous years.

### Organisational audit

An organisational audit of NHS sites in England and Wales treating bowel cancer patients was conducted between November 2015 and March 2016. The aim was to provide a central resource detailing the services provided on-site by individual hospital trusts. The results are available at: <http://content.digital.nhs.uk/pubs/NBOCAOrgAudit2016>. English trusts and Welsh MDTs will be contacted in 2017 for the opportunity to update the information regarding their services.

### Care Quality Commission (CQC)

This year the audit has worked with the CQC, the independent regulator of health and adult social care in England, to provide a slide set of the key audit measures for each trust/hospital in England. These will be provided to CQC inspectors along with the key measures from other audits.

## Review of Performance Indicators

The audit has carried out a review of the performance indicators that it uses to compare networks and trusts/hospitals. A summary of the performance indicators being used, including the definition of each, the inclusion criteria, whether it is risk-adjusted and outlier reported, and which national guideline it maps to, is available at: [www.digital.nhs.uk/bowel](http://www.digital.nhs.uk/bowel).

## The future for the audit

### Linkage to chemotherapy database

The audit will continue to widen its focus to better describe the care of all patients, including those who do not have surgery, and to look earlier and later in the pathways of care. The audit now has agreement in place to access the NHS chemotherapy database which will be used to further understand how these treatments are used in bowel cancer patients.

### Reporting on use of fitness testing

The audit is now collecting information about the use of cardiopulmonary exercise testing (CPET). This may help to explain how patients are selected for surgery.

### New data items

This year the audit will collect the new data items detailed below. These have been added with the intention of describing more completely the care of patients with advanced disease, regional variation in stoma rate and complications following surgery:

- Metastatic site
- MDT meeting type
- Tumour height above anal verge
- Unplanned return to theatre.

## 2. Methods

### Methods – NBOCA 2016

- Since 1 April 2013, audit data has been submitted via NHS Digital's Clinical Audit Platform (CAP). Data is collected at the trust level in England and centrally from the Cancer Network Information System Cymru (CaNISC) system in Wales.
- Historic data submitted via the Open Exeter system is now held in the CAP system.
- Case ascertainment is calculated for English strategic clinical networks and trusts, using Hospital Episode Statistics (HES) data to estimate the denominators.
- The audit dataset is linked to HES data at the patient level to obtain further information on patient care and follow-up. The equivalent data for Wales (Patient Episode Data Wales (PEDW)) was not available.
- Funnel plots are used to compare the following four outcomes between English strategic clinical networks and between trusts/hospital sites: 90-day mortality after major resection; 30-day emergency readmission after major resection; two-year mortality after major resection and 18-month stoma rate after major resection for rectal cancer. The 90-day and two-year mortality funnel plots also include Wales and Welsh MDTs. All outcomes are adjusted for patient case-mix.
- Potential outliers on these four risk-adjusted outcomes are reported back to strategic clinical networks/Wales and to trusts/hospital sites in advance of the report being published.

### 2.1 Data collection

All 164 eligible NHS trusts/hospital sites in England and health boards in Wales submitted data to the audit for inclusion in the 2016 Annual Report. All analyses in this report, except two-year survival and 18-month stoma rate, are performed on patients in England and Wales submitted to the audit who were diagnosed between 1 April 2014 and 31 March 2015. Data is also available from the previous four audits and comparisons are made across years for certain outcomes.

Since April 2013, patient data has been collected via NHS Digital's Clinical Audit Platform (CAP) system. This allows only one treatment record to be listed per patient and patients identified as being submitted to the audit in a previous year are excluded from subsequent audits. The dataset has been redesigned to contain fewer items, some of which are mandatory, with the aim of improving data completeness across all patients. All participating trusts in England individually submitted their data for this annual report to this system. The Welsh data was submitted centrally from CaNISC.

Historic audit data from Open Exeter was transferred to the CAP system and is available for review and editing if required. Further information about Open Exeter and the data transfer are available in [Section 1.1](#) of the 2015 supportive document, found at: <http://content.digital.nhs.uk/catalogue/PUB19500/nati-clin-audi-supp-prog-bowe-canc-supdoc-2015.pdf>.

### 2.2 Data processing – type 2 objections

Patients in England who do not want their personal confidential information to be shared outside of NHS Digital, for purposes other than for their direct care, can register a type 2 opt-out with their GP practice. Approximately 800 patients submitted by trusts following a bowel cancer diagnosis in 2014-15 were removed from the data obtained by NHS Digital before it was sent for analysis due to a type 2 opt-out request.

Across England as a whole the proportion of patients who have requested type 2 opt-out was two per cent in August 2016, with variation by region. More information about type 2 opt-out is available at: <http://content.digital.nhs.uk/article/7092/Information-on-type-2-opt-outs>.

## 2.3 Case ascertainment

Case ascertainment for England is expressed as a ratio of the number of bowel cancer patients reported to the audit compared to the number of patients admitted for the first time to the participating units with a date of diagnosis of bowel cancer within the audit period, according to Hospital Episode Statistics (HES) data. HES, an administrative database containing records of all admissions to English NHS trusts, was used to estimate the denominator of this proportion. A patient was considered to be diagnosed with primary bowel cancer when admitted to hospital for the first time with a diagnosis of bowel cancer (C18, C19 or C20 according to the International Classification of Diseases 10th Revision) in the first diagnosis field. It was assumed to be a first bowel cancer admission if no previous bowel cancer diagnosis could be identified in any of the diagnostic fields since 1 April 2009. The equivalent administrative database for Wales, Patient Episode Database for Wales (PEDW), was unavailable; therefore no case ascertainment is presented for Welsh MDTs.

Case ascertainment by year for England is given in [Table 2.1](#). Case ascertainment at English strategic clinical network and trust level is given in [Table 7.1](#).

## 2.4 Linkage to HES

Audit data was linked to HES data to obtain further information about hospital admissions. In particular HES is useful for analysing certain patient outcomes including emergency readmissions and stoma provision. The mode of admission (elective or emergency) is recorded in HES, as is the number of co-morbidities, which is defined according to the Charlson co-morbidity score.

Patients treated at hospitals in England were linked to HES records using their NHS numbers, date of birth, sex and postcode. 93 per cent of patients undergoing major surgery at English trusts in the audit could be linked to HES. For this annual report the audit has been unable to obtain PEDW data for those patients receiving treatment in Wales. As a result of this, no estimates for length of stay, 30-day unplanned readmissions or 18-month stoma rates are available for Welsh patients. Estimates for English NHS trusts exclude those patients not linked to HES. Risk-adjusted mortality estimates for all Welsh patients and English patients not linked to HES, relied on imputed data for co-morbidities and mode of admission.

**Table 2.1**  
Case ascertainment by year for England

	2010-11	2011-12	2012-13	2013-14	2014-15
<b>Patients identified in HES</b>	31,273	31,844	31,052	30,037	30,230
<b>Patients identified in audit</b>	27,258	27,875	28,841	28,123	28,013
<b>% case ascertainment</b>	87	88	93	94	93

## 2.5 Linkage to RTDS

This is the first year that the audit has linked to the National Radiotherapy Dataset (RTDS). The dataset contains information about radiotherapy treatment received by patients, such as primary cancer site, intent, dose, number of attendances, first appointment date, and reason for treatment which are gathered where possible into a summary record of the radiotherapy treatment episode.

Patients treated at hospitals in England were linked to RTDS records using their NHS numbers, date of birth, sex and postcode. Treatment episodes were grouped into long course, short course or other, based on the number of attendances. The audit date of surgery was used to distinguish between pre-operative and post-operative (not used in this report) treatment. RTDS data was used as the basis of the first definitive non-surgical treatment; if no RTDS data was available for a patient, these variables were updated from the audit pre-operative treatment variable (capturing audit-only radiotherapy and patients recorded as receiving chemotherapy only). 89 per cent of patients diagnosed at hospitals in England between April and December 2014 who had pre-operative radiotherapy recorded in the audit, had a RTDS record that could be classified as pre-operative.

For the last three months of the audit reporting period (January to March 2015) the linkage to RTDS is poorer, therefore the results using RTDS for rectal cancer patients are restricted to patients diagnosed between April and December 2014. RTDS data is not available for Welsh patients unless they received the radiotherapy in England. Therefore the pre-treatment variable recorded in audit data is presented for Welsh patients.

## 2.6 Data completeness

Data completeness is defined as the proportion of patients with complete data items on all seven of the variables: age, sex, ASA grade, pathological TNM stage (tumour, node, metastasis staging) and site of cancer, as these audit variables are used for risk-adjustment. Mode of admission and number of co-morbidities are also used in the risk-adjustment model but as these variables are collected from HES data they are not included in the assessment of data completeness. Data completeness is only assessed in patients who underwent major surgery, because only in these patients could all seven data items be expected to be complete.

Where pathological M-stage is submitted as 'not assessed' (Mx) or 'not recorded' (M9) it is updated from pre-operative tumour staging where recorded as M0 or M1. Dukes' staging is no longer in the audit dataset and therefore can no longer be used to update missing values of M-stage. For the purposes of the audit, the following recorded tumour stages are considered to be missing data: Tx, T9, Nx, N9, Mx, M9.

Data completeness reports have been sent to each NHS trust both to provide feedback on the data submitted and to point to highlighted areas for improvement. The removal of Duke's staging from the dataset and subsequent change in handling of pathological M-stage data led to a significant drop in overall data completeness in 2013-14, which appears to be starting to improve (Table 2.2). If only records with a recorded pathological M-stage are considered, the long term trend in improved data completeness continues. Data completeness by strategic clinical network/trust/MDT is shown in Table 7.1.

**Table 2.2**  
Percentage of patients undergoing major surgery with complete data on the seven items from the audit used in risk-adjustment, by audit year

	2010-11		2011-12		2012-13		2013-14		2014-15	
	Number	%	Number	%	Number	%	Number	%	Number	%
<b>Total patients undergoing major resection</b>	18,701		18,944		19,638		19,218		18,809	
<b>Complete data on seven key items</b>	15,245	81.5	15,760	83.2	17,439	88.8	15,295	79.6	15,458	82.2
<b>Data completeness if TNM M-stage recorded (denominator/%)</b>	17,876	85.3	18,425	85.5	19,203	90.8	16,189	94.5	16,246	95.2

## 2.7 Handling missing data

Multiple imputation using chained equations was used to fill in any missing risk factor information for the four adjusted outcomes reported at trust and strategic clinical network level. This method uses a patient's other risk factors to predict their missing information, whilst taking into account the uncertainty due to their missing information.

In addition to the variables in the risk-adjustment model, and the outcomes, the following variables were included in the imputation model: surgical urgency, mode of admission according to the audit, surgical procedure, number of lymph nodes extracted, number of positive lymph nodes extracted, Index of Multiple Deprivation, length of hospital stay, and days from diagnosis to surgery.

Amongst patients undergoing major surgery, 4.9 per cent were missing ASA grade, 5.2 per cent were missing TNM T-stage, 5.3 per cent were missing TNM N-stage and 13.6 per cent were missing TNM M-stage. Mode of admission and Charlson co-morbidity score came from HES and were missing in patients who were not linked to HES. Virtually all patients had complete data on sex, age, and site of cancer.

## 2.8 Definition of outcomes derived from HES

Length of hospital stay was calculated for patients undergoing major surgery and was defined as the number of days between the date of surgery, and either the date of discharge or death, according to HES.

Emergency readmission within 30-days of surgery was derived for patients undergoing major surgery, and was defined as an emergency admission to any hospital for any cause within 30-days of surgery. Emergency admissions include: admission via Accident and Emergency, general practitioner, bed bureau, or consultant outpatient clinic.

This outcome has been changed from emergency readmission within 90-days of surgery to increase the likelihood of the readmission being due to a surgery-related problem rather than other medical problems or related to chemotherapy complications.

18-month stoma rate was estimated for rectal cancer patients undergoing major surgery. Patients undergoing an abdominoperineal excision of the rectum (APER) or Hartmann's procedure according to the audit were assumed to have had a stoma at the time of their primary procedure. This was classified as permanent in patients having an APER.

HES data was used to capture whether anterior resection (AR) patients received a stoma and the type of stoma that was created. In patients having an AR or Hartmann's procedure, information on subsequent stoma reversal was also obtained from HES. A procedure code for reversal of ileostomy or colostomy within 18-months of surgery was assumed to mean that the patient had their stoma reversed.

## 2.9 Definition of Surgical Urgency

The audit uses the pre-2004 National Confidential Enquiry into Patient Outcomes and Death (NCEPOD) classification of surgical urgency (below):

- **Elective:** Operation at a time to suit both patient and surgeon e.g. after an elective admission
- **Scheduled:** An early operation (usually within three weeks) but not immediately life-saving. This category often includes patients treated on cancer pathways with targets
- **Urgent:** As soon as possible after resuscitation and usually within 24 hours
- **Emergency:** Immediate and life-saving operation, resuscitation simultaneous with surgical treatment. Operation usually within two hours.

## 2.10 Statistical Analysis

Most results reported in this audit report are descriptive. The results of categorical data items are reported as percentages (per cent). The denominator of these proportions is in most cases the number of patients for whom the value of the data item was not missing. Results are typically grouped by strategic clinical network and/or trust/hospital/MDT. England's 13 strategic clinical networks were used in the analyses, and compared to Wales as a whole. The results for Wales are reported according to where the multi-disciplinary team who discussed the patients' management were located, rather than by trust/hospital.

## Funnel plots

Funnel plots are used to make comparisons between strategic clinical networks or between trusts/hospitals on the following outcomes: 90-day mortality after major surgery; 30-day emergency readmission after major surgery; two-year mortality after major surgery; and 18-month stoma rates for rectal cancer patients undergoing major surgery. The rate for each strategic clinical network or for each trust or hospital is plotted against the total number of patients used to estimate the rate. The 'target' is specified as the average rate across all strategic clinical networks/trusts/hospitals.

The funnel limits depend on the target rate and the number of patients included in the estimate; rate estimates have greater uncertainty when estimated from fewer patients. Results fall outside the inner limits if they are statistically significantly different from the target at a 0.05 level, and outside the outer limits if they are statistically significantly different from the target at a 0.002 level. The inner funnel limit is the threshold for an "alert" and the outer funnel level is the threshold for an "alarm". This implies that 95 per cent of the trusts or hospitals are expected to be within the inner funnel limits and 99.8 per cent within the outer funnel limits, if they are all performing according to the target.

If all trusts/hospitals in this report had the same underlying rate for a particular outcome, four would be expected to lie above the inner limits and 0.2 above the outer limit by chance alone.

Strategic clinical networks, trusts or hospitals with results outside the outer (99.8 per cent) funnel limit are considered as potential outliers and have been contacted according to the recommended HQIP procedure.

## Adjusted outcomes

A previously peer-reviewed model for risk-adjustment of post-operative mortality in bowel cancer patients was used<sup>2</sup>. Multivariable logistic regression was carried out to estimate risk-adjusted 90-day post-operative mortality, 30-day emergency readmission, and 18-month stoma rates for rectal cancer patients undergoing major surgery. A Poisson model was fitted to estimate risk-adjusted two-year mortality after major surgery. Unlike the 90-day mortality, 30-day emergency readmission rate and 18-month stoma rate, the two-year mortality rate takes into account the length of time each patient was followed up for. The observed two-year mortality is the number of patients who died within two years divided by the sum of the amount of time each patient is followed for. For example, in two trusts/hospitals with the same proportion of patients dying within two years, the trust in which patients die earlier will have a higher two-year mortality rate.

Multivariable Regression Model Variables	
Patient Characteristics	Age (modelled as age plus age-squared) Sex
Morbidity and Presentation	ASA grade; Charlson co-morbidity score (according to HES). Mode of admission (according to HES)
Cancer	T-stage (pathological), N-stage (pathological), M-stage (pathological), Site of tumour

An interaction between age and distant metastases was also included in the models to allow age to have a different effect in patients with and without metastases. Once patients have metastatic disease the effect of age is found to be far less important than in patients without metastases. The model for two-year survival additionally included interactions between epoch (0-3 months after surgery versus 3-24 months after surgery) and all of the risk factors. This allows risk factors to have a different effect shortly after surgery and in the longer term. For example, the effect of ASA grade is much larger peri-operatively than in the longer-term, whilst cancer stage has a much larger impact on longer-term than short-term mortality. The model for 18-month stoma rate did not include cancer site as it was for rectal cancer patients only.

Patients with missing date of surgery were excluded, and multiple imputation was used to fill in any missing information on the risk factors. The following trusts were excluded from the listed analysis because overall data completeness was less than 20 per cent or ASA grade and/or TNM stage was missing in more than 80 per cent patients included in the analysis:

- **90-day mortality and 30-day readmission:**

- Colchester Hospital University NHS Foundation Trust
- Hampshire Hospitals NHS Foundation Trust – Basingstoke and North Hampshire Hospital
- The Queen Elizabeth Hospital, King's Lynn, NHS Foundation Trust
- University Hospital of North Midlands NHS Trust – County Hospital

- **Two-year survival:**

- Frimley Health NHS Foundation Trust – Heatherwood and Wexham Park Hospitals

The trusts have been made aware of this. This is the second consecutive year that the four trusts excluded from 90-day mortality and 30-day readmission (previously 90-day readmission) have been excluded from these analyses. Frimley Health NHS Foundation Trust – Heatherwood and Wexham Park Hospitals has not previously been excluded from two-year survival.

The adjusted outcomes were estimated using indirect standardisation. The observed number of events for a trust or hospital was divided by the number expected on the basis of the multivariable regression model. The adjusted rate was then estimated by multiplying this ratio by the average rate in all patients included in the analysis.

All statistical analyses were performed using Stata version 14.1.

## 3. Care pathways

### Care pathways – NBOCA 2016

- 55 per cent of patients were diagnosed with bowel cancer following GP referral.
- Nearly 10 per cent of patients were diagnosed through the NHS bowel cancer screening programme. 24 per cent of patients within the eligible age for screening (60 to 74) were diagnosed following a referral from screening.
- Treatment with curative intent varied depending on mode of presentation. Only 52 per cent of patients presenting as an emergency were treated with curative intent compared to 69 per cent of patients diagnosed following GP referral and 88 per cent of patients diagnosed through screening.
- 37 per cent of patients did not undergo major resection. The reasons behind this have been subdivided in four categories: too little cancer (local excision) (4 per cent), too much cancer (metastatic disease) (12 per cent), too frail (performance status 3 or 4) (5 per cent) or unknown/other reason (16 per cent).
- 90-day survival varied depending on patient pathways: major resection (97 per cent), too little cancer (99 per cent), too much cancer, (65 per cent) and too frail (70 per cent).

### 3.1 Q: Where are patients with bowel cancer presenting?

#### Referral source

The majority of patients (55 per cent) were diagnosed with bowel cancer following a GP referral, as shown in [Table 3.1](#). The proportion of patients diagnosed following a referral from screening services continued to be almost 10 per cent. Patients referred from screening services tended to have earlier cancers and were more likely to be treated with curative intent than patients diagnosed via other referral means.

Patients diagnosed following an emergency admission had more advanced disease, poorer performance status and were comparatively older than patients diagnosed from GP or screening services. Only half of these patients had curative treatment intent, compared to 70 per cent and 90 per cent in those diagnosed via GP and screening services respectively.

A large proportion of patients (16 per cent) were missing referral source data. This may account for a degree of the regional variation in referral pattern as demonstrated in [Figure 3.1](#).

Table 3.1

Description of the 30,122 patients diagnosed with bowel cancer between 1 April 2014 and 31 March 2015, by referral source

		Emergency admission		GP Referral		Screening referral		Other/ Not known	
		Number	%	Number	%	Number	%	Number	%
<b>Total patients</b>		<b>5,832</b>		<b>16,509</b>		<b>3,007</b>		<b>4,774</b>	
<b>Sex</b>	<b>Male</b>	2,972	51.0	9,230	55.9	1,938	64.4	2,741	57.4
	<b>Female</b>	2,860	49.0	7,278	44.1	1,069	35.6	2,033	42.6
	<b>Missing (% of total)</b>	0 (0.0)		1 (0.0)		0 (0.0)		0 (0.0)	
<b>Age-group</b>	<b>≤65 yrs</b>	1,545	26.5	4,490	27.2	968	32.2	1,407	29.5
	<b>65-74 yrs</b>	1,291	22.1	4,282	25.9	1,934	64.3	1,342	28.1
	<b>75-84 yrs</b>	1,844	31.6	5,585	33.8	93	3.1	1,502	31.5
	<b>85+ yrs</b>	1,152	19.8	2,152	13.0	12	0.4	523	11.0
<b>Cancer site</b>	<b>Caecum/ascending colon</b>	2,009	34.4	3,987	24.2	507	16.9	1,370	28.7
	<b>Hepatic flexure</b>	279	4.8	562	3.4	101	3.4	231	4.8
	<b>Transverse colon</b>	476	8.2	833	5.0	170	5.7	327	6.8
	<b>Splenic flexure/descending colon</b>	547	9.4	781	4.7	186	6.2	278	5.8
	<b>Sigmoid colon</b>	1,461	25.1	3,592	21.8	953	31.7	1,018	21.3
	<b>Rectosigmoid</b>	246	4.2	912	5.5	188	6.3	224	4.7
	<b>Rectal</b>	814	14.0	5,842	35.4	902	30.0	1,326	27.8
<b>Pre-treatment TNM T-stage</b>	<b>T1</b>	91	1.6	584	3.5	287	9.5	313	6.6
	<b>T2</b>	409	7.0	2,564	15.5	823	27.4	858	18.0
	<b>T3</b>	1,762	30.2	7,399	44.8	1,115	37.1	1,743	36.5
	<b>T4</b>	1,616	27.7	2,778	16.8	157	5.2	650	13.6
	<b>Tx</b>	404	6.9	864	5.2	187	6.2	287	6.0
	<b>T9</b>	1,550	26.6	2,320	14.1	438	14.6	923	19.3
<b>Pre-treatment TNM N-stage</b>	<b>N0</b>	1,702	29.2	5,891	35.7	1,561	51.9	1,965	41.2
	<b>N1</b>	1,392	23.9	4,840	29.3	723	24.0	1,140	23.9
	<b>N2</b>	837	14.4	2,723	16.5	221	7.3	544	11.4
	<b>Nx</b>	347	5.9	632	3.8	76	2.5	158	3.3
	<b>N9</b>	1,554	26.6	2,423	14.7	426	14.2	967	20.3
<b>Pre-treatment TNM M-stage</b>	<b>M0</b>	2,820	48.4	10,520	63.7	2,345	78.0	2,991	62.7
	<b>M1</b>	1,532	26.3	3,065	18.6	178	5.9	696	14.6
	<b>Mx</b>	307	5.3	874	5.3	139	4.6	237	5.0
	<b>M9</b>	1,173	20.1	2,050	12.4	345	11.5	850	17.8
<b>Performance Status</b>	<b>Normal activity</b>	1,176	28.4	5,674	44.6	1,442	65.6	1,587	45.1
	<b>Walk and light work</b>	1,292	31.2	3,997	31.4	566	25.8	1,170	33.3
	<b>Walk and all self care: up &gt;50%</b>	817	19.7	2,002	15.7	158	7.2	526	15.0
	<b>Limited self care: confined &gt;50%</b>	670	16.2	919	7.2	27	1.2	204	5.8
	<b>Completely disabled</b>	182	4.4	141	1.1	5	0.2	30	0.9
	<b>Missing (% of total)</b>	1,695 (29.1)		3,776 (22.9)		809 (26.9)		1,257 (26.3)	
<b>Care Plan Intent</b>	<b>Curative</b>	3,013	51.7	11,310	68.5	2,659	88.4	3,442	72.1
	<b>Non-curative</b>	1,827	31.3	3,346	20.3	125	4.2	720	15.1
	<b>No cancer treatment</b>	466	8.0	804	4.9	42	1.4	246	5.2
	<b>Not known</b>	526	9.0	1,049	6.4	181	6.0	366	7.7
<b>ASA grade*</b>	<b>1</b>	491	13.9	1,675	15.0	446	17.8	459	14.5
	<b>2</b>	1,486	42.2	6,221	55.9	1,652	66.1	1,736	54.9
	<b>3</b>	1,207	34.3	2,975	26.7	376	15.0	872	27.6
	<b>4 or 5</b>	340	9.6	261	2.3	25	1.0	96	3.0
	<b>Missing/Not known (% of total)</b>	2,308 (39.6)		5,377 (32.6)		508 (16.9)		1,611 (33.7)	
<b>Surgical treatment</b>	<b>Major resection</b>	3,175	54.4	10,343	62.7	2,384	79.3	2,907	60.9
	<b>Local excision</b>	48	0.8	581	3.5	273	9.1	266	5.6
	<b>Stoma</b>	228	3.9	504	3.1	12	0.4	78	1.6
	<b>Stent</b>	100	1.7	172	1.0	2	0.1	30	0.6
	<b>Other</b>	330	5.7	399	2.4	37	1.2	197	4.1
	<b>None reported</b>	1,951	33.5	4,510	27.3	299	9.9	1,296	27.1

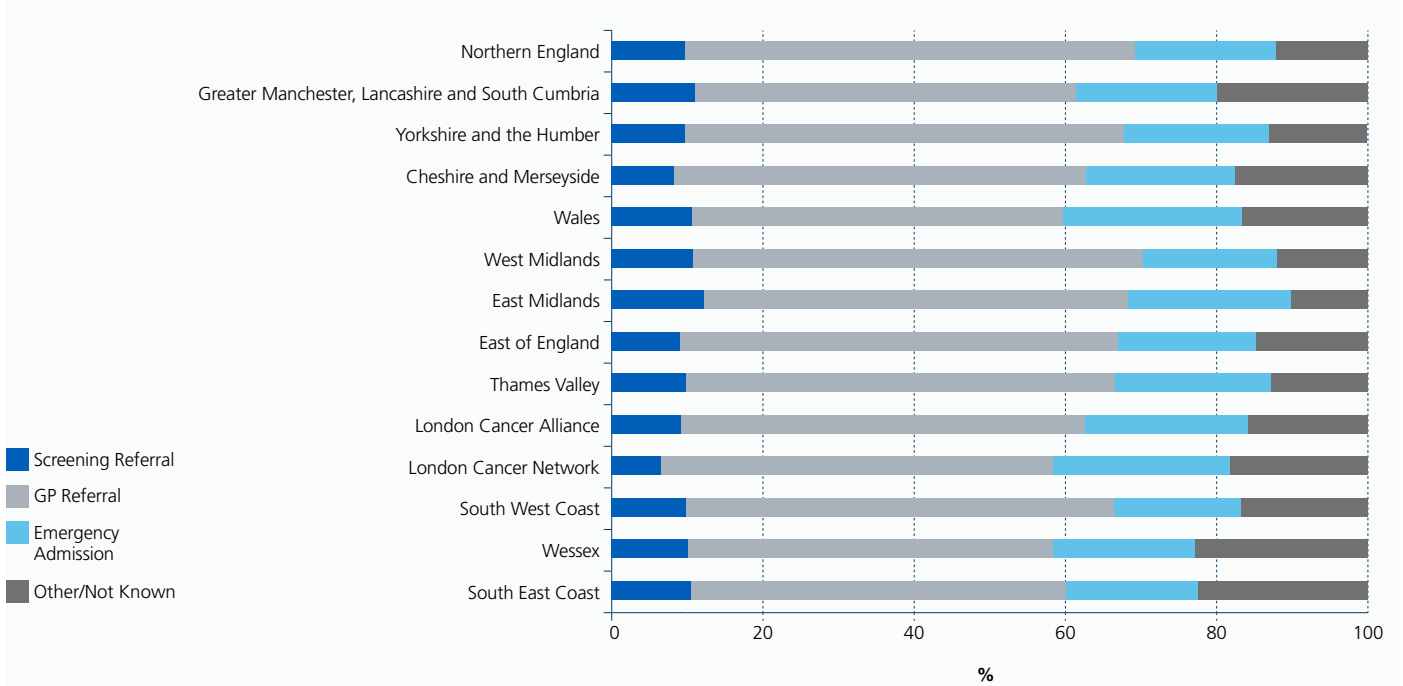
\* ASA grade only required if patient undergoes surgical treatment

## Geographical variation

As shown in Figure 3.1, there was substantial variation between strategic clinical networks in the proportion of patients diagnosed from each referral source. The proportion of patients diagnosed following screening ranged from 7 per cent in London Cancer to 12 per cent in Wales.

Although there are many factors that may contribute towards this disparity, London Cancer had the lowest proportion of patients in the eligible age range for screening (60-74 years) at 36 per cent of all patients, compared to 41 per cent in the East Midlands. Patients diagnosed following emergency admission also varied between strategic clinical networks from 17 per cent in the South West to 24 per cent in Wales.

**Figure 3.1**  
Referral source of the 30,122 patients diagnosed with bowel cancer between 1 April 2014 and 31 March 2015 by network/nation



## 3.2 Q: How are patients treated following diagnosis?

### Care pathways

75 per cent of patients diagnosed with bowel cancer who have a care plan intent recorded were treated with curative intent (Table 3.2). Surgical removal of a locally confined cancer remains the most certain modality of cure but patient suitability and disease characteristics have a profound influence on treatment. A significant proportion of patients (37 per cent) did not undergo major resection. These patients are subdivided into three broad categories:

#### Too little cancer (stage I):

- Those undergoing a local resection or polypectomy OR
- Those with rectal cancer and pre-treatment M0 undergoing long course radiotherapy with curative monitoring intent (to represent those with complete response)

#### Too much cancer (stage IV):

- No excision and reason for no treatment included advanced stage cancer OR
- No excision and non-curative intent and metastatic disease

#### Too frail:

- Not in 'too much cancer' group AND:
- No excision and reason for no treatment includes significant co-morbidity OR
- No excision and performance status 3 or 4

There remains a substantial group of patients (16 per cent) whom it was not possible to classify. More complete information is required on the data items: reason for no treatment, performance status, care plan intent and pre-treatment M-stage to reduce this proportion.

Table 3.2

Description of the 30,122 patients diagnosed with bowel cancer between 1 April 2014 and 31 March 2015, by NBOCA Treatment Pathway

		Curative				Non-curative/No treatment						Unknown pathway or unknown treatment intent	
		Major resection		Too little		Major resection		Too much		Too frail		Other*	
		Number	%	Number	%	Number	%	Number	%	Number	%	Number	%
<b>Total patients</b>		<b>17,655</b>		<b>1,246</b>		<b>1,193</b>		<b>3,561</b>		<b>1,404</b>		<b>5,063</b>	
<b>Gender</b>	<b>Male</b>	9,874	55.9	776	62.3	632	53.0	2,018	56.7	733	52.2	2,848	56.3
	<b>Female</b>	7,780	44.1	470	37.7	561	47.0	1,543	43.3	671	47.8	2,215	43.7
	<b>Missing (% of total)</b>	1 (0.0)		0 (0.0)		0 (0.0)		0 (0.0)		0 (0.0)		0 (0.0)	
<b>Age</b>	<b>≤65 yrs</b>	5,465	31.0	351	28.2	361	30.3	839	23.6	59	4.2	1,335	26.4
	<b>65-74 yrs</b>	5,787	32.8	448	36.0	340	28.5	888	24.9	168	12.0	1,218	24.1
	<b>75-84 yrs</b>	5,163	29.2	332	26.6	354	29.7	1,136	31.9	536	38.2	1,503	29.7
	<b>85+ yrs</b>	1,240	7.0	115	9.2	138	11.6	698	19.6	641	45.7	1,007	19.9
<b>Cancer site</b>	<b>Caecum/ascending colon</b>	4,957	28.1	34	2.7	430	36.0	950	26.7	404	28.8	1,098	21.7
	<b>Hepatic flexure</b>	758	4.3	9	0.7	65	5.4	149	4.2	42	3.0	150	3.0
	<b>Transverse colon</b>	1,126	6.4	20	1.6	89	7.5	230	6.5	89	6.3	252	5.0
	<b>Splenic flexure/descending colon</b>	1,144	6.5	27	2.2	83	7.0	193	5.4	69	4.9	276	5.5
	<b>Sigmoid colon</b>	4,160	23.6	438	35.2	305	25.6	822	23.1	318	22.6	981	19.4
	<b>Rectosigmoid</b>	919	5.2	36	2.9	51	4.3	220	6.2	68	4.8	276	5.5
	<b>Rectal</b>	4,591	26.0	682	54.7	170	14.2	997	28.0	414	29.5	2,030	40.1
<b>Pre-treatment TNM T-stage</b>	<b>T1</b>	649	3.7	431	34.6	11	0.9	27	0.8	15	1.1	142	2.8
	<b>T2</b>	3,488	19.8	202	16.2	62	5.2	164	4.6	198	14.1	540	10.7
	<b>T3</b>	8,000	45.3	91	7.3	393	32.9	1,398	39.3	494	35.2	1,643	32.5
	<b>T4</b>	2,370	13.4	20	1.6	394	33.0	1,191	33.4	236	16.8	990	19.6
	<b>Tx</b>	833	4.7	179	14.4	63	5.3	309	8.7	108	7.7	250	4.9
	<b>T9</b>	2,315	13.1	323	25.9	270	22.6	472	13.3	353	25.1	1,498	29.6
<b>Pre-treatment TNM N-stage</b>	<b>N0</b>	7,706	43.6	722	57.9	228	19.1	587	16.5	516	36.8	1,360	26.9
	<b>N1</b>	5,021	28.4	70	5.6	337	28.2	1,178	33.1	334	23.8	1,155	22.8
	<b>N2</b>	2,083	11.8	30	2.4	271	22.7	1,025	28.8	115	8.2	801	15.8
	<b>Nx</b>	494	2.8	91	7.3	61	5.1	284	8.0	88	6.3	195	3.9
	<b>N9</b>	2,351	13.3	333	26.7	296	24.8	487	13.7	351	25.0	1,552	30.7
<b>Pre-treatment TNM M-stage</b>	<b>M0</b>	13,821	78.3	854	68.5	349	29.3	279	7.8	862	61.4	2,511	49.6
	<b>M1</b>	886	5.0	20	1.6	568	47.6	3,132	88.0	138	9.8	727	14.4
	<b>Mx</b>	930	5.3	85	6.8	68	5.7	27	0.8	98	7.0	349	6.9
	<b>M9</b>	2,018	11.4	287	23.0	208	17.4	123	3.5	306	21.8	1,476	29.2
<b>Performance Status</b>	<b>Normal activity</b>	7,149	52.1	493	55.1	310	36.9	605	21.9	25	2.1	1,297	40.8
	<b>Walk and light work</b>	4,476	32.6	252	28.2	274	32.6	833	30.1	70	5.9	1,120	35.3
	<b>Walk and all self-care: up &gt;50%</b>	1,686	12.3	116	13.0	162	19.3	661	23.9	129	10.8	749	23.6
	<b>Limited self-care: confined &gt;50%</b>	361	2.6	29	3.2	78	9.3	542	19.6	801	67.0	9	0.3
	<b>Completely disabled</b>	44	0.3	4	0.4	16	1.9	123	4.5	170	14.2	1	0.0
	<b>Not recorded</b>	3,939 (22.3)		352 (28.3)		353 (29.6)		797 (22.4)		209 (14.9)		1,887 (37.3)	
<b>Missing pathology record<sup>a</sup></b>		774 (4.4)		339 (27.2)		62 (5.2)		3,354 (94.2)		1,306 (93.0)		3,969 (78.4)	
<b>Final pathology T-stage</b>	<b>T0</b>	275	1.6	31	3.4	11	1.0	0	0.0	0	0.0	13	1.2
	<b>T1</b>	1,110	6.6	566	62.4	18	1.6	2	1.0	3	3.1	83	7.6
	<b>T2</b>	2,887	17.1	93	10.3	44	3.9	1	0.5	3	3.1	97	8.9
	<b>T3</b>	8,770	52.0	37	4.1	386	34.1	14	6.8	9	9.2	305	27.9
	<b>T4</b>	3,670	21.7	4	0.4	652	57.6	25	12.1	13	13.3	266	24.3
	<b>Tx</b>	37	0.2	23	2.5	4	0.4	53	25.6	21	21.4	43	3.9
	<b>T9</b>	132	0.8	153	16.9	16	1.4	112	54.1	49	50.0	287	26.2

Table 3.2 (continued)

Description of the 30,122 patients diagnosed with bowel cancer between 1 April 2014 and 31 March 2015, by NBOCA Treatment Pathway

		Curative				Non-curative/No treatment						Unknown pathway or unknown treatment intent	
		Major resection		Too little		Major resection		Too much		Too frail		Other *	
		Number	%	Number	%	Number	%	Number	%	Number	%	Number	%
<b>Final pathology N-stage</b>	<b>N0</b>	10,220	60.5	407	44.9	333	29.4	13	6.3	15	15.3	386	35.3
	<b>N1</b>	4,139	24.5	18	2.0	314	27.8	11	5.3	5	5.1	178	16.3
	<b>N2</b>	2,328	13.8	2	0.2	460	40.7	9	4.3	5	5.1	145	13.3
	<b>Nx</b>	36	0.2	223	24.6	5	0.4	60	29.0	22	22.4	74	6.8
	<b>N9</b>	158	0.9	257	28.3	19	1.7	114	55.1	51	52.0	311	28.4
<b>Final pathology M-stage</b>	<b>M0</b>	14,344	85.0	718	79.2	450	39.8	44	21.3	71	72.4	589	53.8
	<b>M1</b>	913	5.4	11	1.2	560	49.5	161	77.8	9	9.2	162	14.8
	<b>Mx</b>	1,317	7.8	70	7.7	101	8.9	1	0.5	9	9.2	170	15.5
	<b>M9</b>	307	1.8	108	11.9	20	1.8	1	0.5	9	9.2	173	15.8

\* Other includes pathways with small numbers of cases e.g. 273 patients who are recorded as declining treatment and others with data inconsistencies e.g. Curative Care Plan Intent but no recorded treatment

† For Major resection and Too little pathways this data should be recorded. For Too much, Too frail and Not known/Other pathways this data would not be expected unless patient had surgery

## Curative intent

93 per cent of patients treated with curative intent underwent a major resection (Table 3.3). Audit data suggests that around 13 per cent of these patients received neo-adjuvant treatment and 28 per cent adjuvant treatment. The use of radiotherapy in the rectal cancer patients included in this group is further explored in Chapter 6.

The data completeness of location of post-operative care in patients undergoing a major resection has improved to 63 per cent (Table 3.3). Of these, 46 per cent of patients went to either a high care area, High Dependency Unit (HDU) or Intensive Care Unit (ITU) post-operatively.

Seven per cent of patients treated with curative intent underwent endoscopic or minimally invasive local excision of a primary cancer. Over 50 per cent of these patients had rectal cancer. As expected, very few received chemotherapy or radiotherapy in addition to a local excision (Table 3.3).

Linkage to the radiotherapy dataset has allowed, for the first time this year, for patients with complete response to long-course radiotherapy who do not subsequently undergo a major resection, to begin to be identified. Although this number is small at present (51 patients from 21 diagnosing trusts), the improved completeness of the monitoring intent and pre-treatment M-stage data items will allow these patients to be better delineated over subsequent audit periods.

## Non-curative intent

The majority of patients treated with non-curative intent (62 per cent) had metastatic disease (M1) on pre-treatment staging (Table 3.2). 31 per cent of patients treated with non-curative intent underwent a major resection or a palliative surgical procedure (the majority being stoma formation or stent) (Table 3.3).

Around one third of these patients went on to receive palliative post-operative chemotherapy. Nearly half of patients treated with non-curative intent undergoing major resection had an urgent or emergency resection, compared to 14 per cent of patients in the curative intent cohort.

Within the data submitted to the audit, age was an obvious discriminator of frailty. Only 37 per cent of patients aged over 85 years at diagnosis underwent a major resection compared to 67 per cent of patients under the age of 85. Very few of the patients in the 'too frail' cohort underwent either a surgical procedure or received palliative chemotherapy. This reflects the fact that these patients may have significant co-morbidity and further active treatment may not be in their best interests.

We hope future audit data collection will better determine the pattern of surgical decision making in relation to co-morbidity by collecting Cardiopulmonary Exercise Testing (CPET) data, as well as more complete information on performance status and reasons for no treatment.

## Unknown/other

There were over 5,000 patients who did not readily fit into one of the pathways described above. These patients appear to be a varied cohort and their characteristics are not directly comparable to those patients in any particular pathway. Interestingly, almost 50 per cent of patients in this group were treated with curative intent. The proportion of patients who do not fit into a pathway is expected to fall in subsequent audits as data completeness for new audit items increases.

Table 3.3

Description of management of the 30,122 patients diagnosed with bowel cancer between 1 April 2014 and 31 March 2015, by NBOCA treatment pathway

	Curative				Non-curative/No treatment						Unknown pathway or unknown treatment intent		
	Major resection		Too little		Major resection		Too much		Too frail		Other*		
	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%	
<b>Total patients</b>	<b>17,655</b>		<b>1,246</b>		<b>1,193</b>		<b>3,561</b>		<b>1,404</b>		<b>5,063</b>		
<b>Planned treatment†</b>	<b>Surgery</b>	16,174	91.6	1,068	85.7	825	69.2	450	12.6	183	13.0	2,008	39.7
	<b>Radiotherapy</b>	1,276	7.2	103	8.3	52	4.4	302	8.5	156	11.1	993	19.6
	<b>Chemotherapy</b>	2,541	14.4	70	5.6	342	28.7	1,460	41.0	51	3.6	1,194	23.6
	<b>Specialist Palliative Care</b>	5	0.0	8	0.6	87	7.3	1,240	34.8	457	32.5	636	12.6
	<b>Brachytherapy</b>	10	0.1	0	0.0	1	0.1	2	0.1	1	0.1	17	0.3
	<b>None</b>	371	2.1	115	9.2	152	12.7	476	13.4	607	43.2	935	18.5
<b>Reason for no treatment</b>	<b>Patient declined</b>	4	0.0	3	0.2	22	1.8	32	0.9	65	4.6	273	5.4
	<b>Unfit: co-morbidity</b>	4	0.0	7	0.6	32	2.7	49	1.4	713	50.8	1	0.0
	<b>Unfit: advanced disease</b>	17	0.1	40	3.2	142	11.9	1,141	32.0	0	0.0	0	0.0
	<b>Multiple</b>	0	0.0	0	0.0	4	0.3	145	4.1	42	3.0	0	0.0
	<b>NK</b>	248	1.4	52	4.2	125	10.5	69	1.9	51	3.6	468	9.2
	<b>Missing</b>	17,382	98.5	1,144	91.8	868	72.8	2,125	59.7	533	38.0	4,321	85.3
<b>Active monitoring intent</b>	<b>Curative</b>	2,556	14.5	213	17.1	20	1.7	26	0.7	19	1.4	179	3.5
	<b>Palliative</b>	29	0.2	8	0.6	118	9.9	717	20.1	264	18.8	176	3.5
	<b>Unknown or uncertain future intent</b>	148	0.8	28	2.2	37	3.1	99	2.8	90	6.4	200	4.0
	<b>None</b>	4,674	26.5	284	22.8	347	29.1	903	25.4	365	26.0	1,244	24.6
	<b>Missing</b>	10,248	58.0	713	57.2	671	56.2	1,816	51.0	666	47.4	3,264	64.5
<b>First definitive non-surgical treatment</b>	<b>Long Course RT</b>	1,305	7.4	73	5.9	52	4.4	79	2.2	30	2.1	622	12.3
	<b>Short Course RT</b>	435	2.5	30	2.4	24	2.0	193	5.4	103	7.3	373	7.4
	<b>Other/Brachy</b>	50	0.3	3	0.2	1	0.1	85	2.4	45	3.2	166	3.3
	<b>Chemotherapy</b>	448	2.5	6	0.5	73	6.1	812	22.8	14	1.0	528	10.4
	<b>None recorded</b>	15,417	87.3	1,134	91.0	1,043	87.4	2,392	67.2	1,212	86.3	3,374	66.6
<b>Surgical Urgency</b>	<b>Elective/Scheduled</b>	15,209	86.2	1,107	88.8	626	52.5	279	7.8	74	5.3	720	14.2
	<b>Emergency/Urgent</b>	2,411	13.7	61	4.9	564	47.3	267	7.5	66	4.7	545	10.8
	<b>Missing (% of total)</b>	35	0.2	78	6.3	3	0.3	3,015	84.7	1,264	90.0	3,798	75.0
<b>Type of Surgery</b>	<b>Major Resection</b>	17,655	100.0	0	0.0	1,193	100.0	0	0.0	0	0.0	248	4.9
	<b>Local Excision</b>	0	0.0	1,195	95.9	0	0.0	0	0.0	0	0.0	0	0.0
	<b>Stoma</b>	0	0.0	6	0.5	0	0.0	301	8.5	59	4.2	456	9.0
	<b>Stent</b>	0	0.0	0	0.0	0	0.0	138	3.9	40	2.8	126	2.5
	<b>Other</b>	0	0.0	1	0.1	0	0.0	122	3.4	44	3.1	482	9.5
	<b>None recorded</b>	0	0.0	44	3.5	0	0.0	3,000	84.2	1,261	89.8	3,751	74.1
<b>Treatment Aim (following surgery)</b>	<b>Palliative</b>	369	2.1	30	2.5	740	62.0	500	89.1	105	73.4	443	33.8
	<b>Curative</b>	16,865	95.5	1,093	90.9	383	32.1	30	5.3	29	20.3	494	37.7
	<b>Uncertain</b>	421	2.4	79	6.6	70	5.9	31	5.5	9	6.3	375	28.6
	<b>Missing</b>	0	0.0	44	3.5	0	0.0	3,000	84.2	1,261	89.8	3,751	74.1
<b>Post-operative Destination</b>	<b>Standard ward</b>	5,997	54.2	552	93.6	275	42.8	245	79.8	59	70.2	425	70.0
	<b>High Care Area</b>	1,762	15.9	21	3.6	110	17.1	19	6.2	6	7.1	47	7.7
	<b>HDU (Level 2)</b>	2,317	21.0	11	1.9	137	21.3	23	7.5	12	14.3	88	14.5
	<b>ITU (Level 3)</b>	982	8.9	6	1.0	120	18.7	20	6.5	7	8.3	47	7.7
	<b>Missing</b>	6,597 (37.4)		656 (52.6)		551 (46.2)		3,254 (91.4)		1,320 (94.0)		4,456 (88.0)	
<b>Post-operative Chemotherapy</b>	<b>Yes</b>	4,714	26.7	23	1.9	385	32.3	162	28.9	5	3.5	229	17.5
	<b>No</b>	12,941	73.3	1,179	98.1	808	67.7	399	71.1	138	96.5	1,083	82.5
	<b>Not relevant</b>	0 (0.0)		44 (3.5)		0 (0.0)		3,000 (84.2)		1,261 (89.8)		3,751 (74.1)	

\* Other includes pathways with small numbers of cases e.g. 273 patients who are recorded as declining treatment; those with curative care plan intent but no recorded treatment

† Patients can have more than one planned treatment recorded therefore the percentage total may be greater than 100

## Geographical variation in care pathways

As shown in Figure 3.2 the proportion of patients undergoing major resection ranged from 58 per cent in Cheshire and Merseyside to 66 per cent in Northern England.

The variation between strategic clinical networks in the proportion of patients unassigned to one of the four pathways has reduced. Much of the variability still present may represent differences in data completeness.

**Figure 3.2**  
Treatment pathway by strategic clinical network/Wales



## 30- and 90-day mortality according to care pathway

As expected, the proportion of patients who died within 30 and 90 days of diagnosis differed greatly between pathways. Around 35 per cent of patients who did not undergo a major resection due to advanced disease, and 30 per cent of patients considered too frail to undergo major resection, died within 90 days of diagnosis.

15 per cent of patients who underwent a major resection with non-curative intent died within 90 days of diagnosis. In contrast, two per cent of patients undergoing a major resection with curative intent died within 90 days of diagnosis.

The unknown/other category has a mortality rate in between that of the other pathways suggesting this group contains patients from a mix of the four pathways.

The audit is in the process of establishing a link to the Systemic Anti-Cancer Treatment (SACT) dataset. This is a result of the mandatory collection of systemic anti-cancer therapy activity from all NHS England chemotherapy providers. Use of this dataset will allow the audit to further explore the care received by patients with advanced disease and those too frail to undergo a major resection.

**Table 3.4**  
Chance of death by pathway

	Curative				Non-curative/No treatment						Unknown pathway or unknown treatment intent	
	Major resection		Too little		Major resection		Too much		Too frail		Other*	
	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%
<b>Total patients</b>	<b>17,655</b>		<b>1,246</b>		<b>1,193</b>		<b>3,561</b>		<b>1,404</b>		<b>5,063</b>	
<b>Died before diagnosis confirmed</b>	29	0.2	0	0.0	25	2.1	17	0.5	5	0.4	15	0.3
<b>Died within 30 days of diagnosis</b>	155	0.9	3	0.2	72	6.2	476	13.4	177	12.7	217	4.3
<b>Died within 90 days of diagnosis</b>	357	2.0	12	1.0	171	14.6	1,240	35.0	419	29.9	635	12.6

## Recommendations – care pathways

- The contribution of the NHS bowel cancer screening programme to the diagnosis of patients with early bowel cancer is demonstrated. All health professionals should be encouraged to actively promote participation in this service to increase service uptake.
- Clinicians and data managers should prioritise data completeness for: reason for no treatment, performance status, care plan intent and pre-treatment M-stage. This will reduce the proportion of patients who do not undergo a major resection who are unassigned to a treatment group and therefore better describe the care and outcomes in this cohort.

## 4. Surgical care

### Surgical care – NBOCA 2016

- Overall 90-day mortality after major surgery has steadily reduced over five years from 5.4 per cent in 2010-11 to 3.8 per cent in 2014-15.
- 90-day mortality following elective or scheduled surgery for bowel cancer was 2.1 per cent in contrast to 12.3 per cent in patients who had surgery on an urgent or emergency basis.
- 70 per cent of patients are still in hospital more than five days following major resection. This has remained unchanged over the last four audit periods.
- Overall, 1 in 10 patients had an emergency readmission within 30 days of major resection. This has again remained stable over the last four audit periods.
- Now more than half of major resections are completed laparoscopically.

### 4.1 Q: How many patients die within 90 days of major surgery?

#### 90-day post-operative mortality over time

Over the past five years the proportion of patients undergoing major resection has remained relatively constant, while unadjusted post-operative mortality has decreased ([Table 4.1](#)). In 2014-15, 3.8 per cent of patients died within 90-days of major resection.

**Table 4.1**  
Patients undergoing major surgery and chance of death after major surgery, by audit year

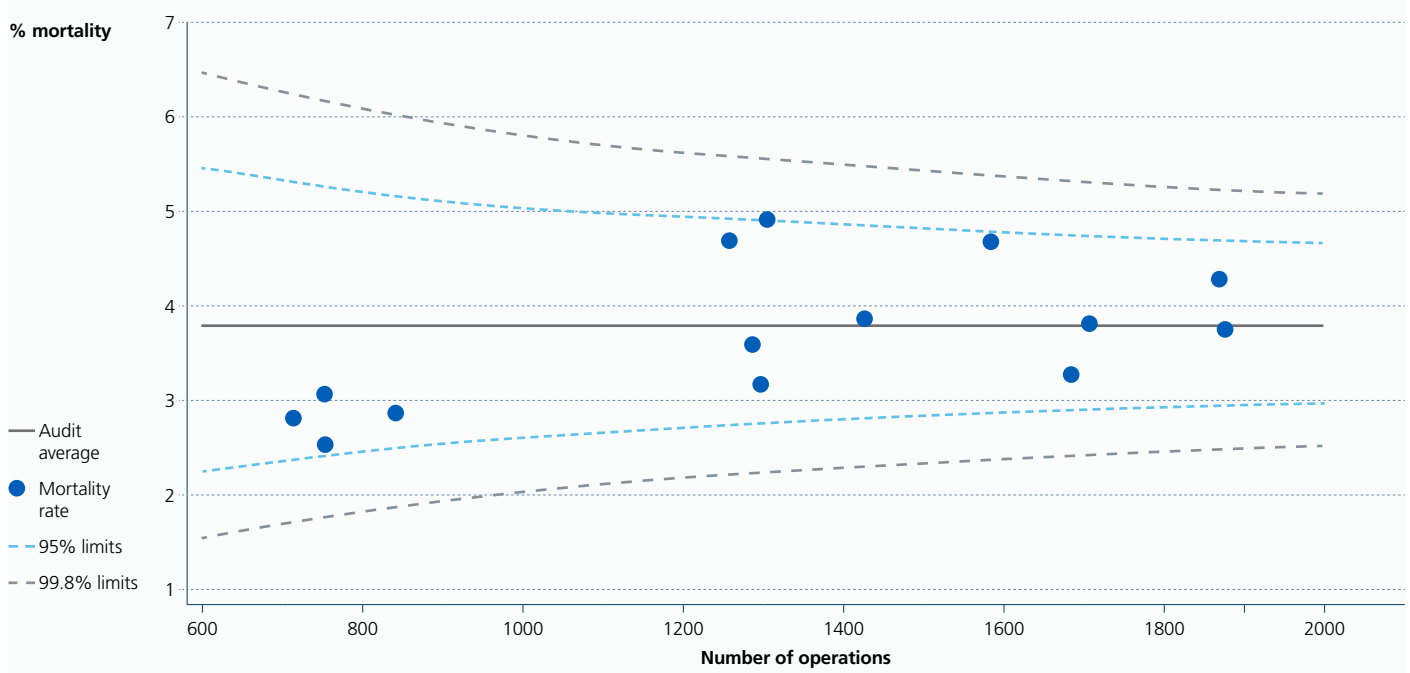
	2010-11		2011-12		2012-13		2013-14		2014-15	
	Number	%	Number	%	Number	%	Number	%	Number	%
<b>Total patients</b>	<b>28,600</b>		<b>29,900</b>		<b>30,875</b>		<b>30,136</b>		<b>30,122</b>	
<b>Undergoing major resection</b>	18,701	65.4	18,944	63.4	19,631	63.6	19,217	63.8	18,809	62.4
<b>Dead at 90 days after surgery, out of those undergoing major resection</b>	1,001	5.4	890	4.7	933	4.8	755	3.9	706	3.8

## Variation in 90-day post-operative mortality between care providers

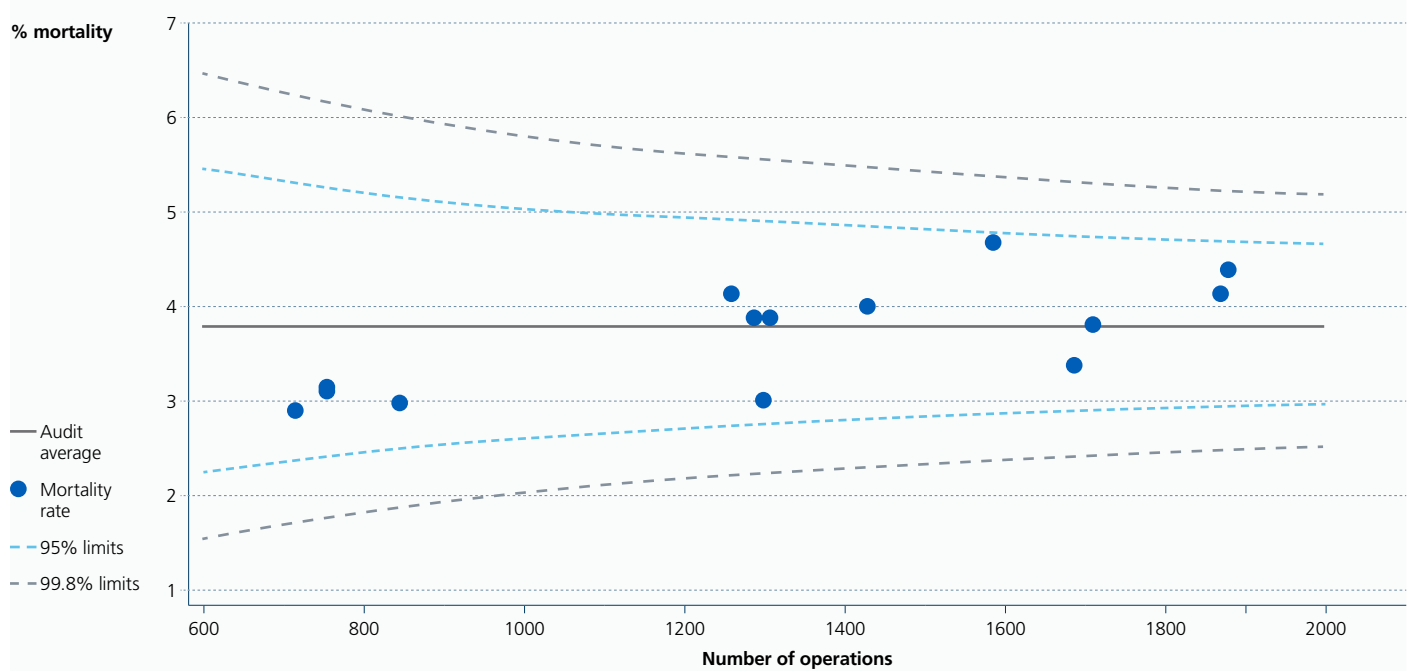
The variation in 90-day post-operative mortality across strategic clinical networks is shown in Figure 4.1. When making comparisons between strategic clinical networks and between trusts/hospitals, 90-day mortality was adjusted for the nine risk factors listed on Page 15. After risk-adjustment there were no networks outside the inner limits.

**Figure 4.1**  
Observed and adjusted 90-day post-operative mortality (elective and emergency admissions) by English strategic clinical network/Wales for patients diagnosed between 1 April 2014 and 31 March 2015

### Observed 90-day mortality by network/nation



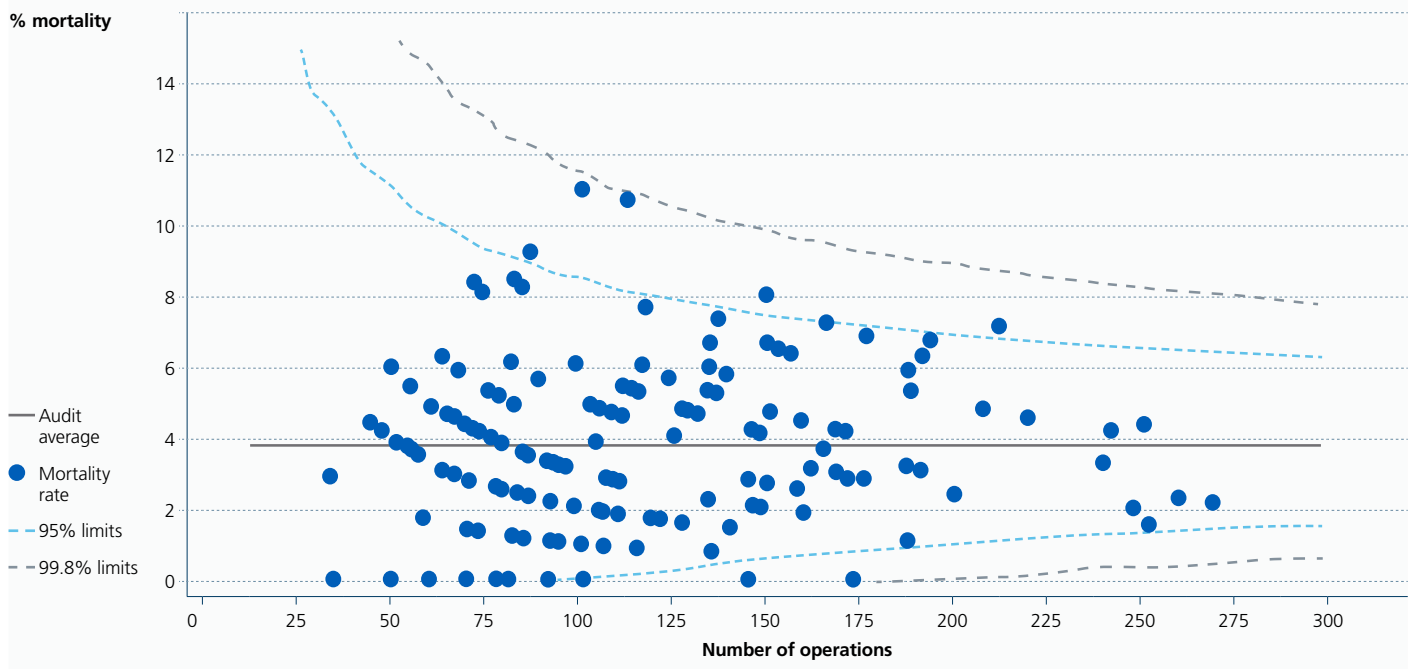
### Adjusted 90-day mortality by network/nation



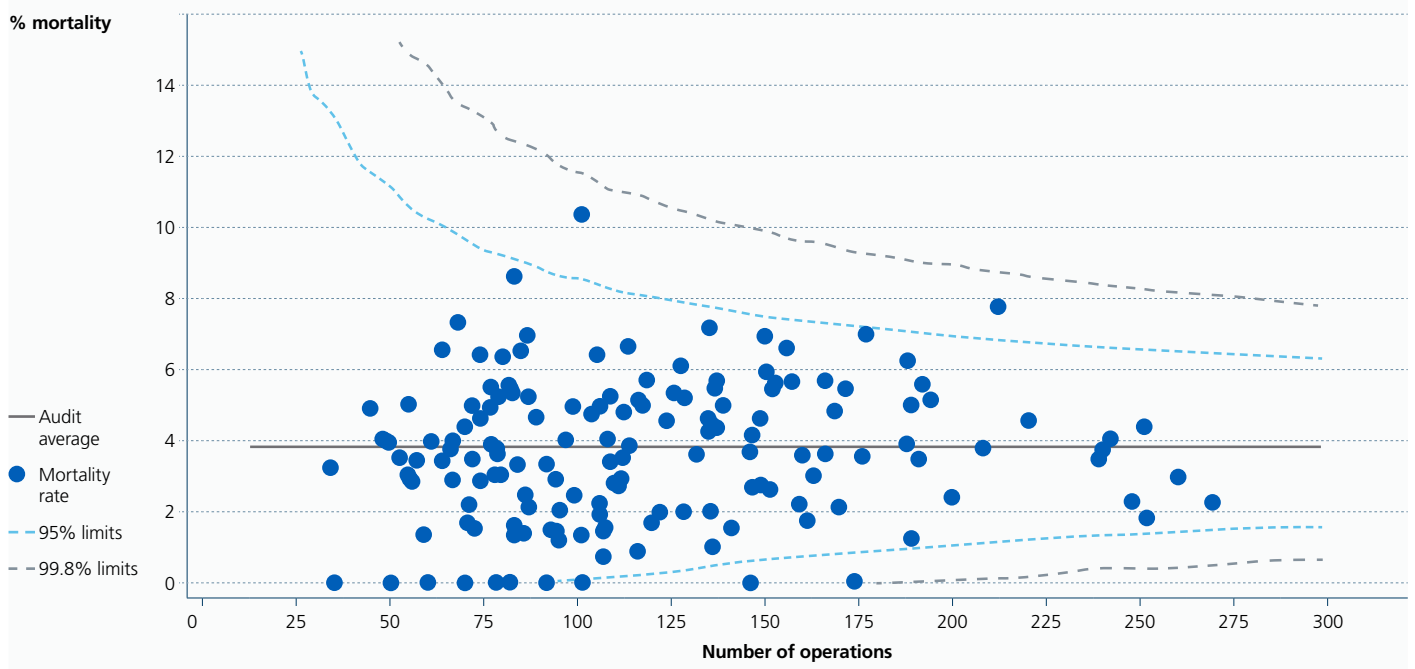
Funnel plots for 90-day post-operative mortality by trust/hospital, both observed and risk-adjusted, are presented in Figure 4.2. There were no trusts outside the outer limit for adjusted 90-day mortality and the number outside the inner limits was no more than expected by chance.

**Figure 4.2**  
Observed and adjusted 90-day post-operative mortality (elective and emergency admissions) by trust/hospital with more than 10 operations for patients diagnosed between 1 April 2014 and 31 March 2015

**Observed 90-day mortality by trust/site with more than 10 operations**



**Adjusted 90-day mortality by trust/site with more than 10 operations**



## 90-day post-operative mortality according to operative urgency

20 per cent of patients were diagnosed with bowel cancer following an emergency admission (Table 4.2). This has been a relatively unchanging feature of clinical practice in England and Wales. As a consequence of this pattern of admissions, 16 per cent of patients having major surgery had an urgent or emergency procedure.

This varied according to trust/hospital site and less than 10 per cent of major resections were classified as urgent/emergency in 25 trusts and over 20 per cent were classified as urgent/emergency in 41 trusts (Table 7.3).

The 90-day mortality following elective or scheduled surgery for bowel cancer was 2.1 per cent (Table 4.3), in contrast to 12.3 per cent in patients who had major surgery on an urgent or emergency basis. Mortality in both groups is similar to that in 2013-14 (2.3 per cent in elective/scheduled surgery and 12.1 per cent in urgent/emergency surgery).

**Table 4.2**  
Emergency admissions in England (from HES), by audit year

	2010-11		2011-12		2012-13		2013-14		2014-15	
	Number	%	Number	%	Number	%	Number	%	Number	%
<b>Total patients</b>	<b>27,541</b>		<b>28,412</b>		<b>29,312</b>		<b>28,577</b>		<b>28,478</b>	
<b>Emergency admission</b>	5,422	22.0	5,176	20.6	5,478	21.1	5,294	21.1	4,959	20.4
<b>Elective admission</b>	19,259	78.0	19,983	79.4	20,532	78.9	19,782	78.9	19,314	79.6
<b>Missing (% of total)</b>	2,860 (10.4)		3,253 (11.4)		3,302 (11.3)		3,501 (12.3)		4,205 (14.8)	

**Table 4.3**  
Mortality in patients who had major surgery by surgical urgency

	2010-11		2011-12		2012-13		2013-14		2014-15		
	Number	%	Number	%	Number	%	Number	%	Number	%	
<b>Total patients undergoing major resection</b>	<b>18,701</b>		<b>18,944</b>		<b>19,631</b>		<b>19,217</b>		<b>18,809</b>		
<b>Overall 90-day mortality*</b>	1001/18,686	5.4	890/18,944	4.7	933/19,630	4.8	754/19,212	3.9	706/18,805	3.8	
<b>90-day mortality by urgency of operation</b>	<b>Elective</b>	433/12,099	3.6	353/12,377	2.9	362/12,688	2.9	277/12,546	2.2	249/12,131	2.1
	<b>Scheduled</b>	111/3,234	3.4	104/3,370	3.1	122/3,819	3.2	90/3,588	2.5	87/3,652	2.4
	<b>Urgent</b>	159/1,443	11.0	150/1,300	11.5	168/1,303	12.9	132/1,255	10.5	110/1,212	9.1
	<b>Emergency</b>	282/1,667	16.9	262/1,686	15.5	277/1,700	16.3	252/1,790	14.1	2,58/1,780	14.5
	<b>Missing urgency of operation</b>	16/243	6.6	21/211	10.0	4/120	3.3	3/33	9.1	2/30	6.7

\* Some patients are missing mortality data (ONS date of death occurred prior to the reported date of surgery (all 2013-2015) or a valid date of surgery could not be transferred to CAP from Open Exeter).

## 4.2 Q: How long do patients stay in hospital after major bowel cancer resection?

### NBOCA Short Report 2016

#### The impact of hospital discharge services on length of stay after bowel cancer resection

A short report investigating the impact of hospital discharge services on length of stay after major bowel cancer surgery has been published and is available at: <http://content.digital.nhs.uk/pubs/NBOCAShortReports2016>.

#### Key findings:

- Enhanced Recovery After Surgery (ERAS) programmes exist in 98 per cent of trusts/hospital sites.
- No inpatient service (ERAS specialist nurses, discharge co-ordinators, more frequent consultant reviews and managing patients on a dedicated bowel cancer surgery ward) impacted on length of stay after major resection.
- There was significant variation between trusts in the proportion of patients with a length of stay greater than five days. This remained after adjusting for clinico-pathological variables and discharge services.

These findings suggest that inpatient discharge services do not reduce the number of patients with a long length of stay. Efforts to facilitate discharge may need to be focused on improving the provision of, and reducing any regional disparity in, community and primary care services.

### Trends in length of stay over time

Table 4.4 summarises the length of stay for patients undergoing major bowel resection in England over time. Median length of stay and the proportion of patients with a length of stay of more than five days are relatively unchanged over the last five years.

Median length of stay increased according to patient age (7 days in patients less than 75 years old and 10 days in patients 85 years or older).

**Table 4.4**  
Length of hospital stay (HES definition) of patients undergoing major resection in England, by audit year

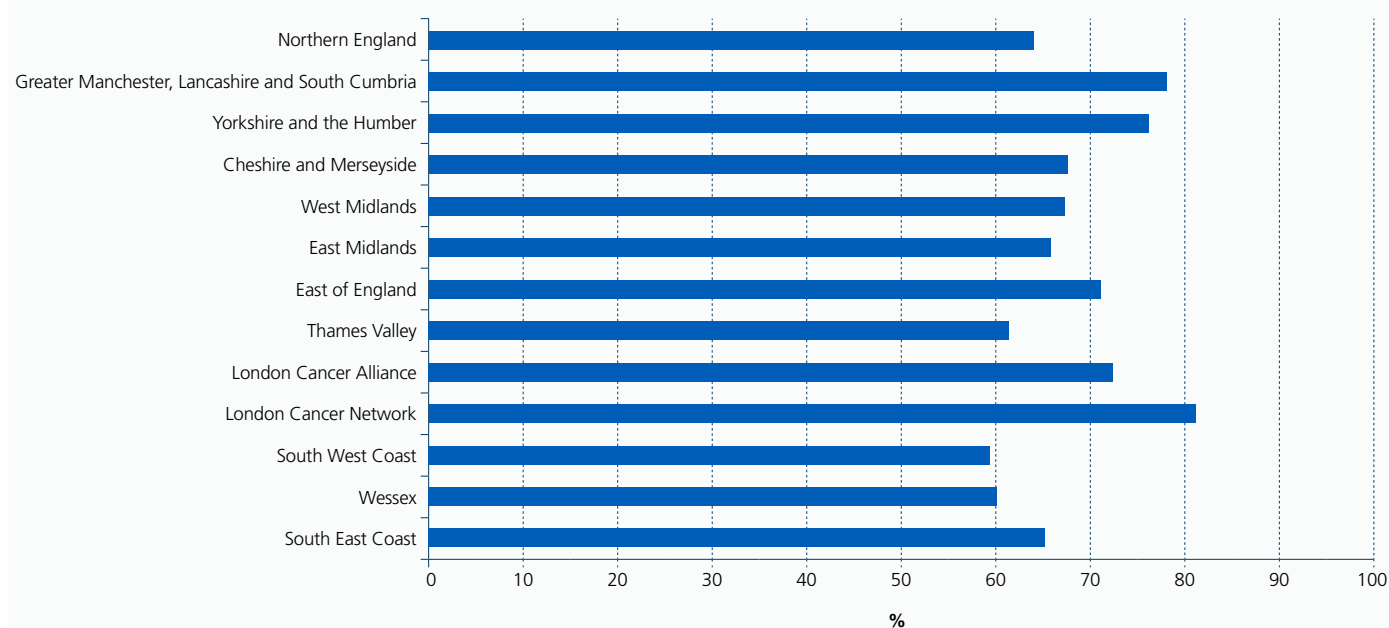
		2010-11		2011-12		2012-13		2013-14		2014-15	
		Number	%	Number	%	Number	%	Number	%	Number	%
<b>Total patients undergoing major resection</b>		<b>17,795</b>		<b>17,699</b>		<b>18,357</b>		<b>17,898</b>		<b>17,489</b>	
<b>Length of hospital stay (LOS)</b>	<b>Median LOS</b>	8		7		7		7		7	
	<b>Range</b>	1-1,912		1-1,562		1-569		1-514		1-374	
	<b>Interquartile range</b>	5-13		5-13		5-13		5-12		5-12	
<b>Length of stay longer than five days</b>	<b>Yes</b>	11,906	71.5	11,591	69.3	12,079	69.8	11,573	69.1	10,956	68.8
	<b>No</b>	4,735	28.5	5,138	30.7	5,232	30.2	5,181	30.9	4,977	31.2
	<b>Missing (% of total)</b>	1,154 (6.5)		970 (5.5)		1,046 (5.7)		1,144 (6.4)		1,556 (8.9)	
<b>Length of hospital stay by age group</b>	<b>&lt;65 years</b>	<b>Median LOS</b>	7		7		7		7		7
		<b>Range</b>	1-1,700		1-950		1-201		1-487		1-169
		<b>Interquartile range</b>	5-11		4-10		5-11		5-10		5-11
	<b>65-74 years</b>	<b>Median LOS</b>	7		7		7		7		7
		<b>Range</b>	1-1,912		1-475		1-569		1-514		1-374
		<b>Interquartile range</b>	5-12		5-12		5-12		5-12		5-11
	<b>75-84 years</b>	<b>Median LOS</b>	9		8		8		8		8
		<b>Range</b>	1-1,791		1-1,562		1-309		1-343		1-359
		<b>Interquartile range</b>	6-15		6-15		6-14		5-14		6-14
	<b>85+ years</b>	<b>Median LOS</b>	11		10		10		10		10
		<b>Range</b>	1-193		1-217		1-139		1-150		1-188
		<b>Interquartile range</b>	7-19		7-18		6-17		7-18		6-17

## Geographical variation in length of stay

There was substantial variation according to strategic clinical networks in the proportion of patients still in hospital five days or longer after resection, as shown in Figure 4.3.

59 per cent of patients in South West stayed in hospital for longer than five days compared to 81 per cent of patients in London Cancer.

**Figure 4.3**  
Proportion of patients with length of hospital stay after major surgery in HES greater than five days by English strategic clinical network\*



\* Equivalent data source (PEDW) is not available for Welsh patients

## 4.3 Q: How many patients have an unplanned readmission within 30 days of discharge from hospital after major bowel cancer surgery?

### Trends in emergency readmissions within 30 days

Overall, 10 per cent of patients had an emergency readmission within 30 days of surgery. This has remained stable over the last five years.

**Table 4.5**  
Emergency hospital readmission rate within 30 days of surgery for patients undergoing major resection in England, by audit year

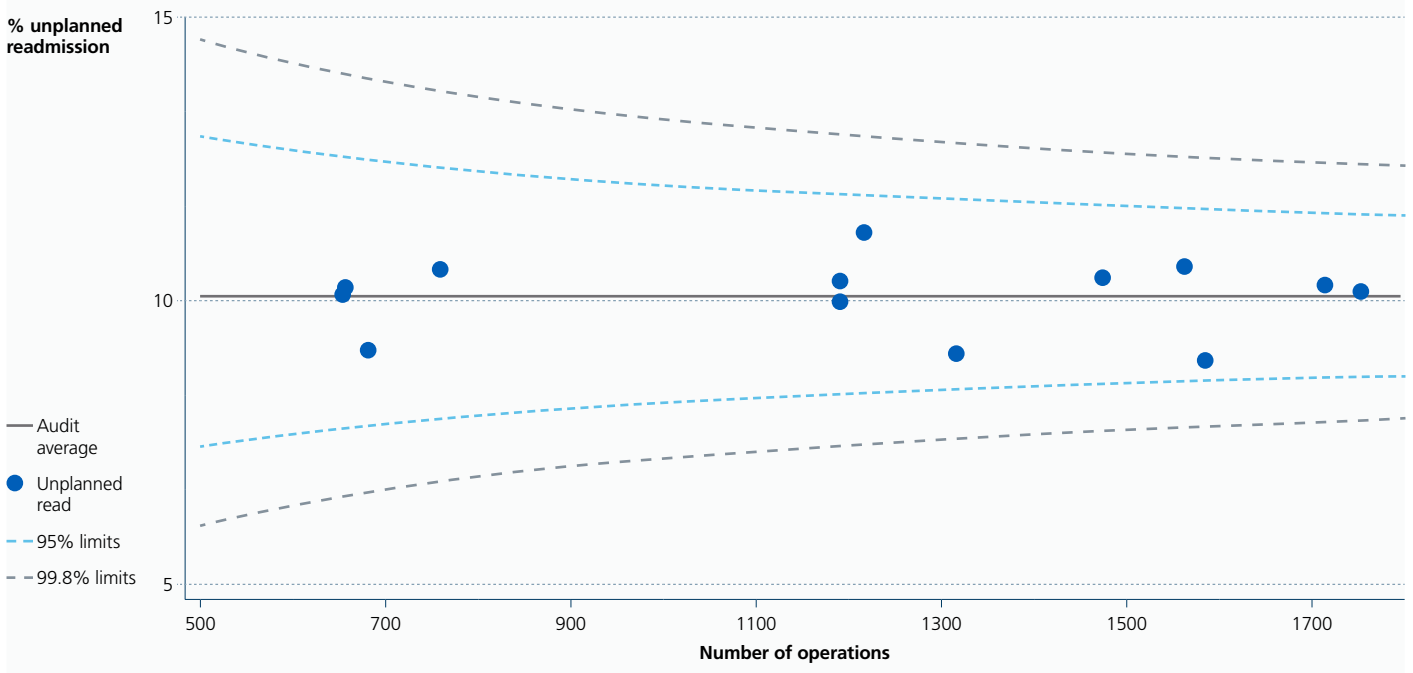
		2010-11		2011-12		2012-13		2013-14		2014-15	
		Number	%	Number	%	Number	%	Number	%	Number	%
<b>Total patients undergoing major resection</b>		<b>17,795</b>		<b>17,699</b>		<b>18,357</b>		<b>17,898</b>		<b>17,489</b>	
Emergency readmission within 30 days	Yes	1,672	10.0	1,720	10.3	1,725	9.9	1,702	10.1	1,607	10.0
	No	15,035	90.0	15,042	89.7	15,640	90.1	15,147	89.9	14,489	90.0
	Missing (% of total)	1,088 (6.1)		937 (5.3)		992 (5.4)		1,049 (5.9)		1,393 (8.0)	

# Geographical variation in 30-day emergency readmission

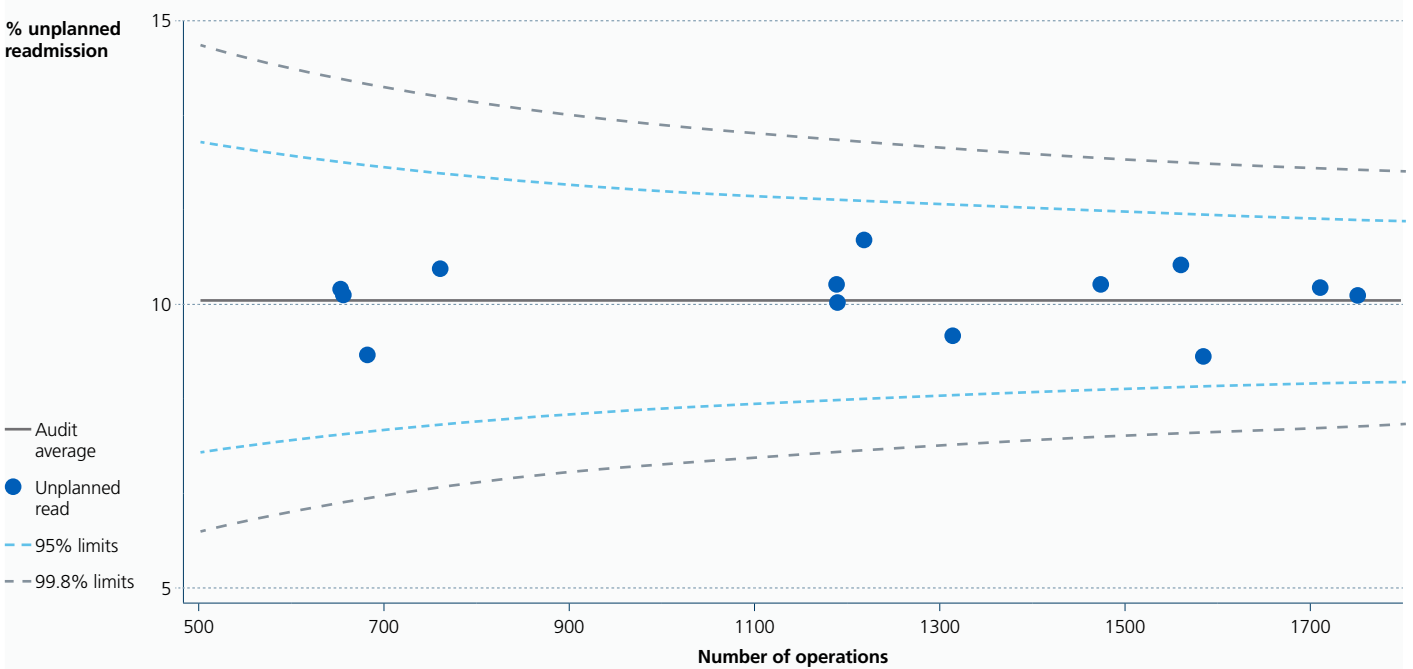
As shown in Figure 4.4 and 4.5, no strategic clinical networks or trust/hospital fell outside the outer or inner limits for observed or adjusted readmission rate.

**Figure 4.4**  
Observed and adjusted 30-day emergency readmission rate by English strategic clinical network for patients diagnosed between 1 April 2014 and 31 March 2015\*

## Observed 30-day unplanned readmission rate by network



## Adjusted 30-day unplanned readmission rate by network

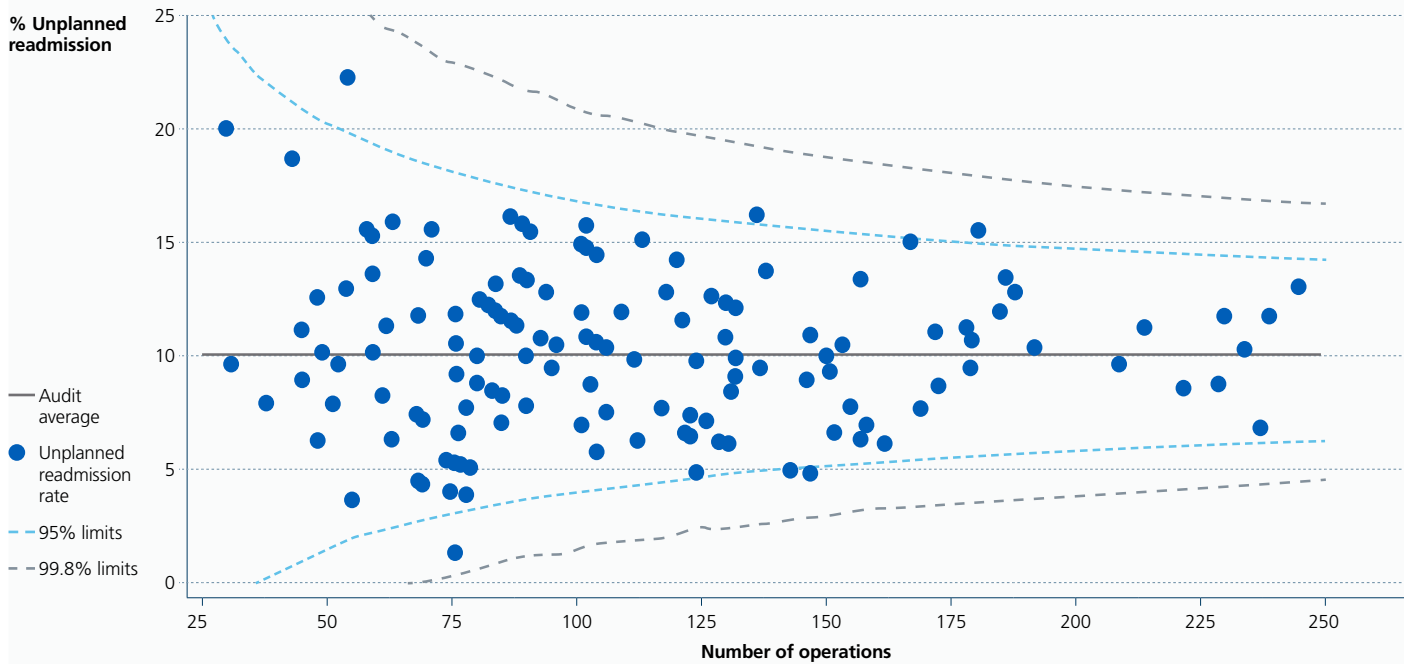


\* Equivalent data source (PEDW) is not available for Wales

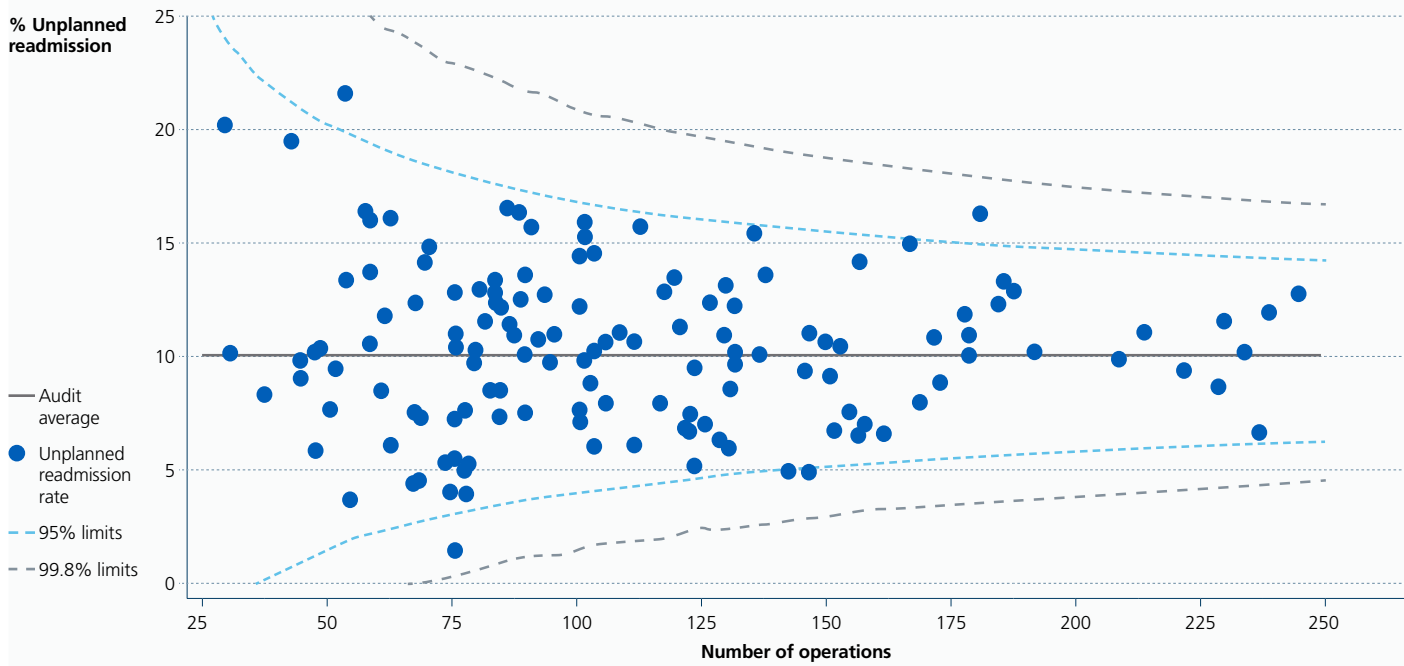
As seen in Figure 4.5, no trust fell outside the outer limits on observed or adjusted readmission rate. Five trusts fell outside the inner limit on adjusted readmission rate. This is no more than would be expected by chance alone.

**Figure 4.5**  
Observed and adjusted 30-day emergency readmission rate by English NHS trust for patients diagnosed between 1 April 2014 and 31 March 2015\*

**Observed 30-day unplanned readmission rate by trust/site with more than 10 operations**



**Adjusted 30-day unplanned readmission rate by trust/site with more than 10 operations**



## 4.4 Q: How many patients have laparoscopic surgery?

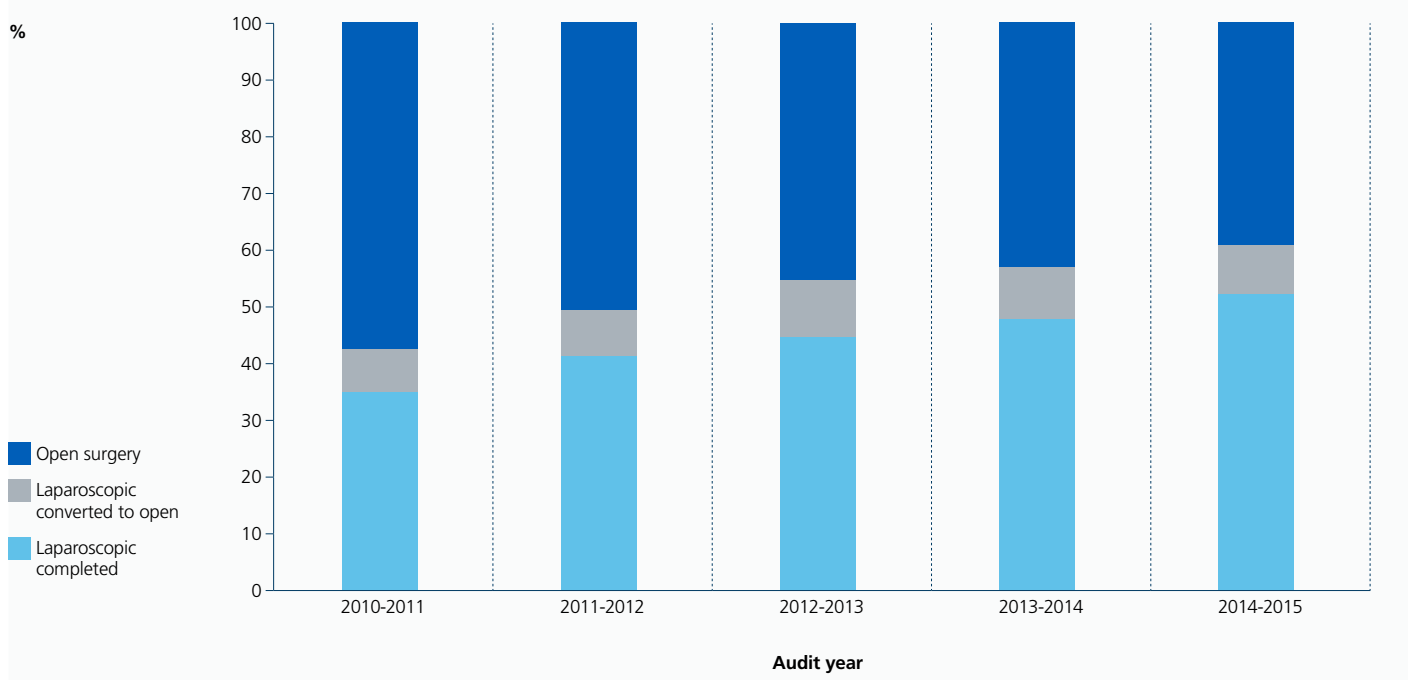
The audit subdivides surgical access into three categories:

- open resection
- laparoscopic converted to open resection
- completed laparoscopic resection.

### Trends in the use of laparoscopic surgery

As shown in [Figure 4.6](#), the proportion of major resections performed laparoscopically has continued to increase. This year more than half of major resections were completed laparoscopically. There was no rebound increase in the unplanned conversion rate which has fallen from 9.0 per cent in 2013-14 to 8.5 per cent in 2014-15.

**Figure 4.6**  
Surgical access by audit year



[Table 4.6](#) describes the surgical access in patients undergoing major surgery according to patient and tumour characteristics. The majority of patients undergoing urgent or emergency operations had open surgery. Patients with advanced cancer, high ASA grade and advanced age were also more likely to have an open resection.

**Table 4.6**  
Mortality in patients who had major surgery by surgical urgency

		Open			Laparoscopic converted to open		Laparoscopic completed	
		Total number	Number	%	Number	%	Number	%
<b>Overall</b>		<b>18,773</b>	<b>7,355</b>	<b>39.2</b>	<b>1,595</b>	<b>8.5</b>	<b>9,823</b>	<b>52.3</b>
<b>Sex</b>	<b>Male</b>	10,469	4,029	38.5	1,052	10.0	5,388	51.5
	<b>Female</b>	8,303	3,326	40.1	543	6.5	4,434	53.4
	<b>Missing</b>	1						
<b>Age-group</b>	<b>≤64 years</b>	5,802	2,250	38.8	488	8.4	3,064	52.8
	<b>65-74 years</b>	6,097	2,201	36.1	535	8.8	3,361	55.1
	<b>75-84 years</b>	5,494	2,237	40.7	505	9.2	2,752	50.1
	<b>85+ years</b>	1,380	667	48.3	67	4.9	646	46.8
<b>ASA grade</b>	<b>1</b>	2,586	885	34.2	191	7.4	1,510	58.4
	<b>2</b>	9,966	3,446	34.6	870	8.7	5,650	56.7
	<b>3</b>	4,765	2,227	46.7	443	9.3	2,095	44.0
	<b>4 or 5</b>	558	370	66.3	31	5.6	157	28.1
	<b>Missing</b>	898	427	47.6	60	6.7	411	45.8
<b>Pre-treatment T-stage</b>	<b>T1</b>	650	162	24.9	47	7.2	441	67.8
	<b>T2</b>	3,517	983	27.9	288	8.2	2,246	63.9
	<b>T3</b>	8,370	2,936	35.1	753	9.0	4,681	55.9
	<b>T4</b>	2,741	1,609	58.7	202	7.4	930	33.9
	<b>Tx</b>	889	388	43.6	76	8.5	425	47.8
	<b>T9</b>	2,606	1,277	49.0	229	8.8	1,100	42.2
<b>Pre-treatment N-stage</b>	<b>N0</b>	7,880	2,706	34.3	664	8.4	4,510	57.2
	<b>N1</b>	5,326	1,998	37.5	467	8.8	2,861	53.7
	<b>N2</b>	2,347	1,096	46.7	186	7.9	1,065	45.4
	<b>Nx</b>	556	282	50.7	51	9.2	223	40.1
	<b>N9</b>	2,664	1,273	47.8	227	8.5	1,164	43.7
<b>Pre-treatment M-stage</b>	<b>M0</b>	14,049	5,049	35.9	1,218	8.7	7,782	55.4
	<b>M1</b>	1,460	826	56.6	109	7.5	525	36.0
	<b>Mx</b>	1,032	449	43.5	85	8.2	498	48.3
	<b>M9</b>	2,232	1,031	46.2	183	8.2	1,018	45.6
<b>Mode of admission (from HES)</b>	<b>Elective</b>	13,434	4,160	31.0	1,249	9.3	8,025	59.7
	<b>Emergency</b>	2,613	1,918	73.4	114	4.4	581	22.2
	<b>Missing*</b>	2,726	1,277	46.8	232	8.5	1,217	44.6
<b>Surgical urgency</b>	<b>Elective</b>	12,117	3,789	31.3	1,116	9.2	7,212	59.5
	<b>Scheduled</b>	3,649	1,293	35.4	369	10.1	1,987	54.5
	<b>Urgent</b>	1,211	878	72.5	54	4.5	279	23.0
	<b>Emergency</b>	1,775	1,385	78.0	56	3.2	334	18.8
	<b>Missing</b>	21	10	47.6	0	0.0	11	52.4
<b>Cancer site</b>	<b>Caecum/ascending colon</b>	5,334	2,117	39.7	383	7.2	2,834	53.1
	<b>Hepatic flexure</b>	818	334	40.8	56	6.8	428	52.3
	<b>Transverse colon</b>	1,197	607	50.7	90	7.5	500	41.8
	<b>Splenic flexure/descending colon</b>	1,222	606	49.6	113	9.2	503	41.2
	<b>Sigmoid colon</b>	4,470	1,691	37.8	419	9.4	2,360	52.8
	<b>Rectosigmoid</b>	977	324	33.2	88	9.0	565	57.8
	<b>Rectal</b>	4,755	1,676	35.2	446	9.4	2,633	55.4
<b>Co-morbidities (from HES)</b>	<b>0</b>	9,286	3,394	36.5	750	8.1	5,142	55.4
	<b>1</b>	4,630	1,825	39.4	408	8.8	2,397	51.8
	<b>2+</b>	2,151	870	40.4	207	9.6	1,074	49.9
	<b>Missing*</b>	2,706	1,266	46.8	230	8.5	1,210	44.7

\* includes patients from Wales who could not be linked to Welsh equivalent of HES (PEDW)

## Geographical variation in laparoscopic surgery

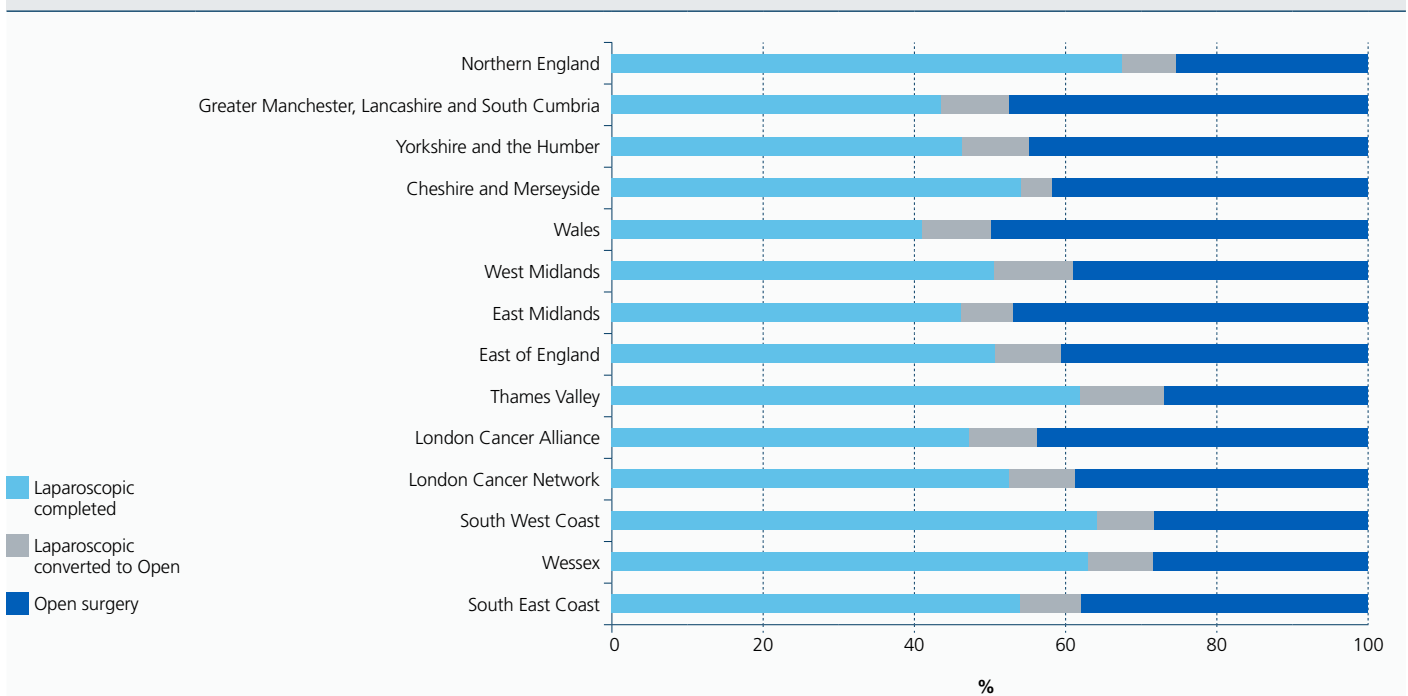
The proportion of patients with laparoscopic completed resections ranged from 41 per cent to 68 per cent across strategic clinical networks as shown in Figure 4.7. Rates of unplanned conversion to open ranged from 4 per cent to 11 per cent and tended to be higher in trusts with higher rates of open surgery.

The use of laparoscopic surgery also varied widely between trusts/hospitals with laparoscopic surgery being used in less than 50 per cent of patients in 50 trusts, and in over 80 per cent of patients in 29 trusts (Table 7.3).

## Recommendations – surgical care

- Improving the post-operative survival in patients undergoing emergency or urgent bowel cancer resection should remain a clinical priority. The provision of pre-operative resuscitation, adequate theatre access, post-operative critical care, and early colorectal team involvement, including full radiological support and facilities for colonic stenting as a bridge to curative surgery or expediting palliative chemotherapy, is likely to improve survival.
- Efforts to reduce long length of stay may need to be more focused on improving the provision of, and reducing any regional disparity in, community and primary care services (as shown in the length of stay short report).
- Potential delays to discharge, particularly in the elderly population, should be considered pre-operatively, to allow for the provision of community services if required, to reduce the risk of prolonged length of hospital stay.

**Figure 4.7**  
Surgical access by English strategic clinical network/Wales



## 5. Survival

### Survival – NBOCA 2016

- Two-year survival rates for all patients diagnosed with bowel cancer has remained stable at 66 per cent.
- Two-year survival rates in patients undergoing major resection has increased from 80 per cent in 2009-10 to 82 per cent in 2012-13.
- No strategic clinical networks fell above or below the outer limit for adjusted two-year mortality amongst patients undergoing a major resection.

### 5.1 Q: What is the two-year survival of patients with bowel cancer?

#### Two-year survival

For the vast majority of bowel cancer patients, survival and cure remain the primary concern after diagnosis although long-term functional outcome is also clearly a patient priority. Whilst 90-day mortality is used to capture death related to surgery, measuring longer-term mortality will also capture death from the cancer itself as well as from other causes. Although conventionally five years of follow-up is used to determine when an individual is cured, the majority of patients that develop recurrent disease do so within the first two years of follow-up. Variation in two-year mortality is likely to reflect, at least in part, differences in the quality of surgery, patient characteristics and provision of neo-adjuvant and adjuvant chemotherapy and radiotherapy.

A redesign of the audit dataset has allowed more complete information to be collected, including staging data, on patients diagnosed with bowel cancer since April 2013 who do not undergo major resection. However, in the most recent year of audit data, 38 per cent of patients who do not undergo a major resection are lacking complete pre-treatment staging data. Until two-year survival using these new data items can be examined, variation in two-year mortality for all patients will not be reported back to strategic clinical networks. Comparisons are only made between strategic clinical networks and between trusts/hospitals on patients undergoing a major resection.

Two-year survival rates for all patients diagnosed with bowel cancer have remained stable at 66 per cent since 2010-11 (Table 5.1). Two-year survival rates in patients undergoing major resection and associated oncology therapy has continued to increase from 80 per cent in 2010-11 to 82 per cent in 2012-13 (Figure 5.1). Similarly the two-year survival in those undergoing local excision has increased from 90 per cent in 2010-11 to 92 per cent in 2012-13.

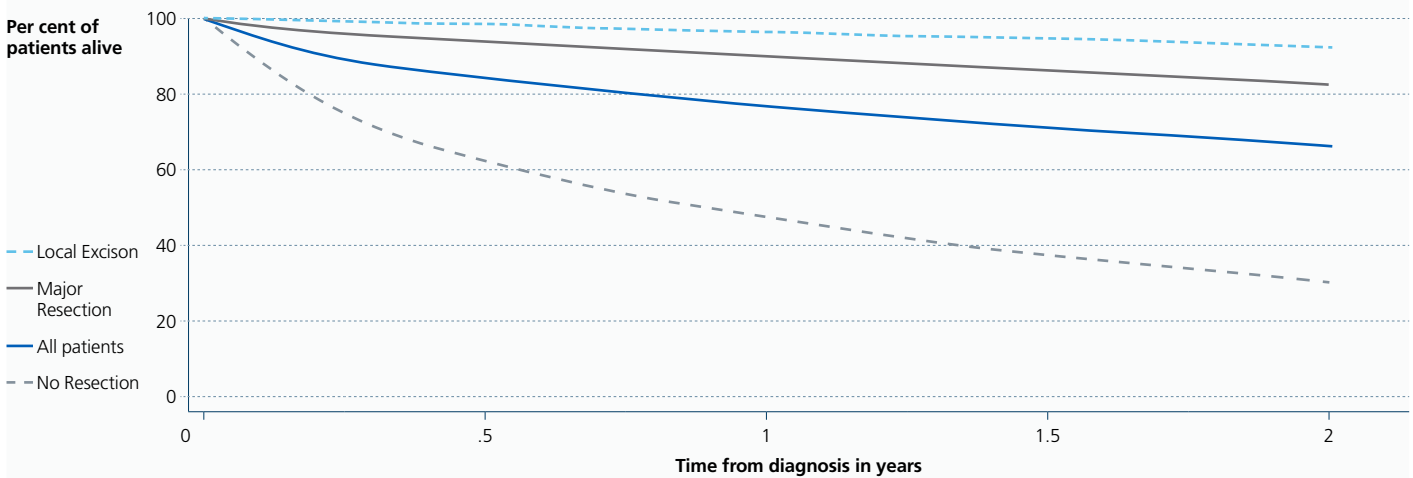
Patients who do not undergo resection may be very frail or have overwhelming disease burden. This is reflected in the comparatively poor survival compared to the other patient groups. There has been a three per cent decrease in two-year survival amongst patients who do not undergo a primary tumour resection. It is difficult to draw conclusions from this increase in mortality which was only seen to occur in the most recent years. This may relate to improved patient selection for major resection and as a result only patients with advanced disease and significant co-morbidity are not undergoing resection.

**Table 5.1**  
Two year survival over time for all patients diagnosed between 1 April 2010 and 31 March 2013

		2010-11		2011-12		2012-13	
		Number	%	Number	%	Number	%
<b>Total patients undergoing major resection</b>		<b>17,795</b>		<b>17,699</b>		<b>17,489</b>	
<b>Died within 24 months of diagnosis</b>	<b>Yes</b>	9,530	33.7	9,823	33.3	10,231	33.6
	<b>No</b>	18,759	66.3	19,681	66.7	20,257	66.4
	<b>Missing (% of total)</b>	74 (0.3)		70 (0.2)		50 (0.2)	
<b>Underwent Major resection</b>		18,591	65.5	18,822	63.6	19,493	63.8
<b>Died within 24 months of diagnosis</b>	<b>Yes</b>	3,641	19.6	3,453	18.4	3,418	17.6
	<b>No</b>	14,913	80.4	15,327	81.6	16,046	82.4
	<b>Missing (% of total)</b>	37 (0.1)		42 (0.1)		29 (0.1)	
<b>Underwent local excision</b>		982	3.5	1,081	3.7	1,381	4.5
<b>Died within 24 months of diagnosis</b>	<b>Yes</b>	102	10.4	104	9.6	107	7.7
	<b>No</b>	880	89.6	977	90.4	1,274	92.3
	<b>Missing (% of total)</b>	0 (0.0)		0 (0.0)		0 (0.0)	
<b>No excision of tumour</b>		8,790	31.0	9,671	32.7	9,664	31.6
<b>Died within 24 months of diagnosis</b>	<b>Yes</b>	5,787	66.1	6,266	65.0	6,706	69.5
	<b>No</b>	2,966	33.9	3,377	35.0	2,937	30.5
	<b>Missing (% of total)</b>	37 (0.1)		28 (0.1)		21 (0.1)	

Figure 5.1

Kaplan-Meier survival curve over two years for all patients diagnosed between 1 April 2012 and 31 March 2013 (England and Wales)



## Geographical variation in two-year survival

There was large variation in two-year patient survival according to strategic clinical network/nation as shown in Figure 5.2. This variation is more than would be expected by chance alone, with one network falling above and two falling below the outer limits. The estimates are not adjusted for patient case-mix and there are many potential causes of the variation. Possible explanations include differences between regions in: the completeness and accuracy of data submitted to the audit, patient characteristics such as deprivation and co-morbidity, the impact of the NHS bowel cancer screening programme, health-seeking behaviour, the quality of primary care, the selection of patients for major resection and the quality of surgery and short- and long-term care of patients after surgery.

Another important factor to take into account is the cause of death. As a proportion of deaths will likely be secondary to diseases other than CRC, data on cause of death may help to understand some of the regional variation in all-cause mortality. The audit has recently received cause of death data, results surrounding which will form part of a short report to be published in 2017.

This year the audit has investigated regional differences in the treatment of patients with metastatic disease in one of its short reports. This may also contribute to the variation in two-year survival.

## NBOCA Short Report 2016

### The impact of a specialist liver team on treatment and outcomes in bowel cancer patients with synchronous liver metastases

A short report investigating the liver resection rates, surgical timing and overall survival in patients diagnosed with bowel cancer and synchronous liver metastases in trusts with a liver MDT compared to those diagnosed in trusts with no liver MDT has been published and is available at: <http://content.digital.nhs.uk/pubs/NBOCASHortReports2016>.

#### Key findings:

- Patients diagnosed at a trust with a liver MDT on-site were more likely to undergo a liver resection after adjusting for patient and tumour characteristics (545/1,081 (50.4 per cent) versus 1,411/3,466 (40.7 per cent); odds ratio 1.51, (95 per cent confidence intervals (CI) 1.20-1.91)).
- The median overall survival, unadjusted for possible case mix differences, was greater in patients diagnosed at trusts with a liver MDT (30.6 months (95 per cent CI 27.8-33.1) versus 25.3 months (95 per cent CI 23.9-26.9);  $p < 0.001$ ).
- Diagnosis at a trust with a liver MDT was independently associated with better survival after controlling for patient and tumour characteristics (Hazard Ratio 0.82 (95 per cent CI 0.72-0.93)).

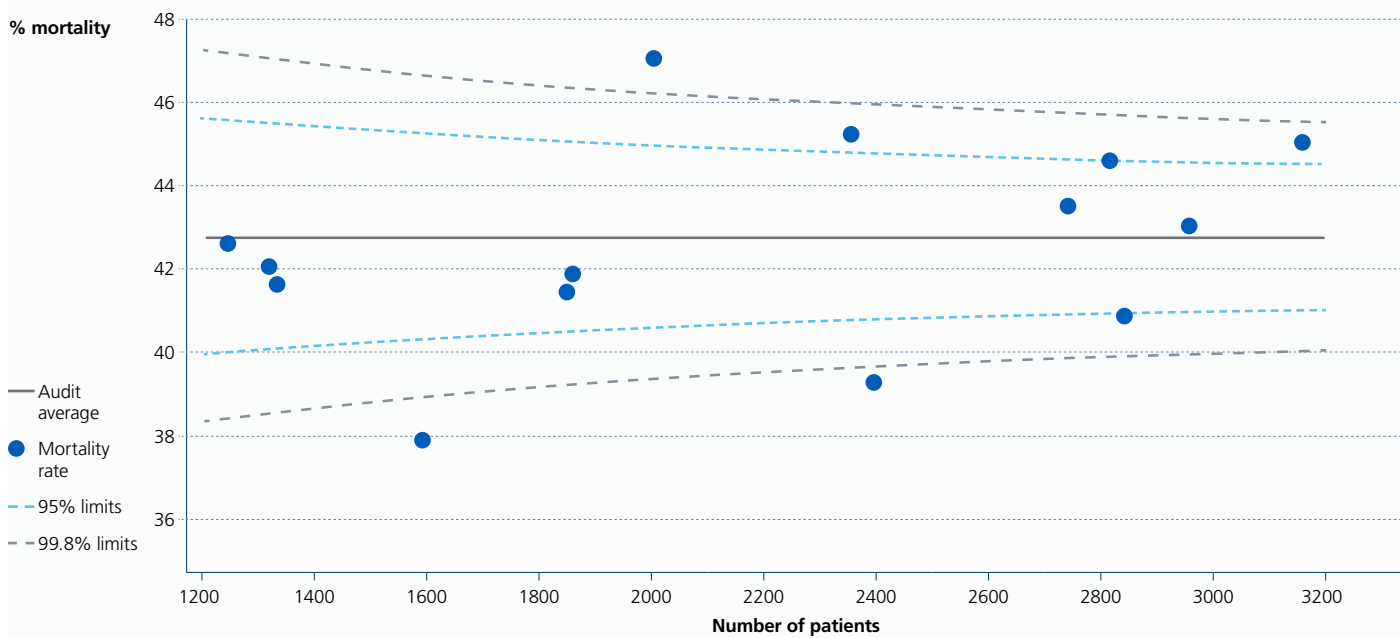
This study indicates increased likelihood of liver resection and better survival in patients diagnosed with bowel cancer and synchronous liver metastases at trusts with a liver MDT. These findings highlight the importance of streamlined referral pathways and explicit guidelines for bowel cancer MDTs to ensure the referral of all potentially eligible patients to specialist liver centres.

Figure 5.2

Observed two-year mortality for all patients (with and without resection) diagnosed between 1 April 2012 and 31 March 2013, by English strategic clinical network/Wales, including trusts/MDTs with more than ten operations

The results cannot be used for regional comparisons

#### Observed two-year mortality rate by network/nation



## Two-year survival in patients undergoing major resection

Risk factors used in the adjustment of 90-day mortality were also used to adjust two-year mortality for case-mix. Each risk factor may have a different effect on the risk of death soon after surgery compared to longer-term mortality and therefore the effect of each risk factor was modelled separately at 0 to 3 months after surgery and three to 24 months after surgery, as explained in the Statistical Analysis Section on [page 15](#).

Figures 5.3 and 5.4 show observed and adjusted two-year mortality amongst patients undergoing a major resection by strategic clinical network and by trust/hospital.

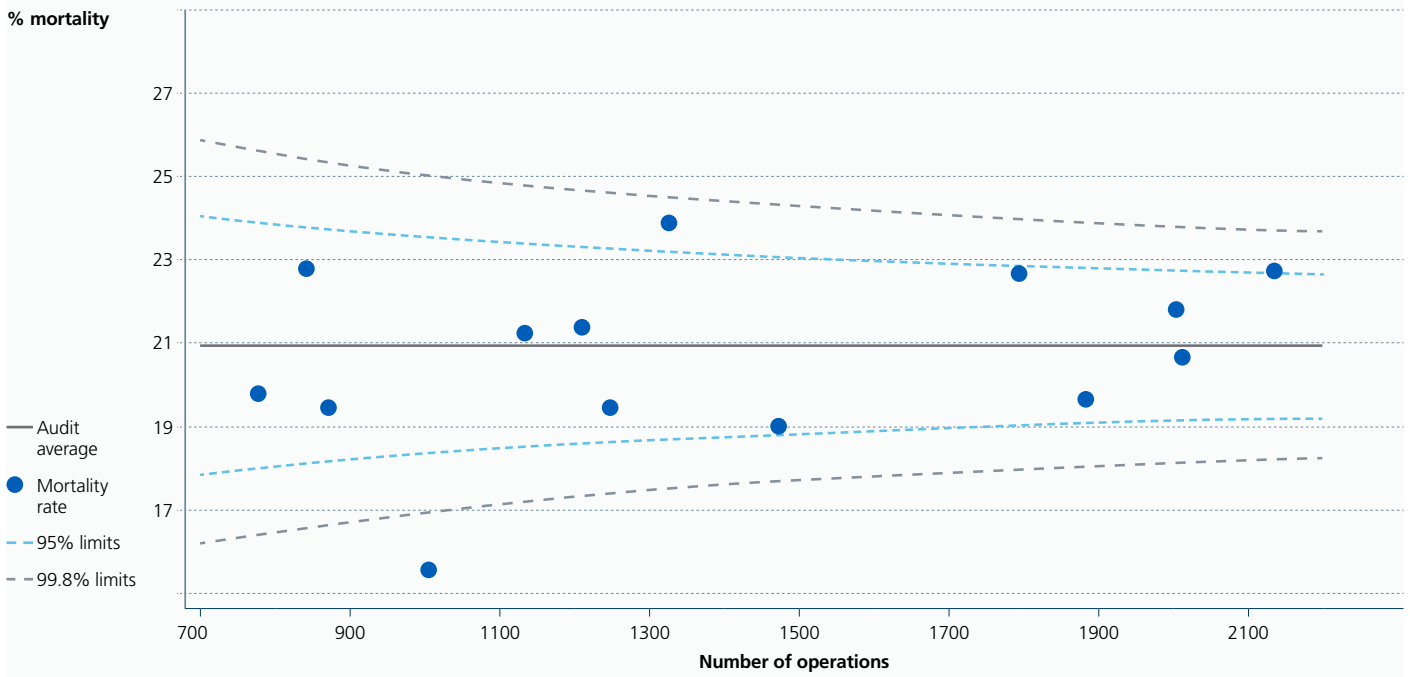
No strategic clinical networks fell above the outer limits. One strategic clinical network fell below the outer limits. This network has consistently outperformed in this measure.

Four trusts/hospitals fell above the outer limits, one of which has previously been an outlier for two-year mortality (when only non-overlapping time periods are considered). These strategic clinical networks and trusts/hospitals were all informed; please see [Appendix 1](#) for details of their responses. A further 16 trusts/hospitals fell above the inner limits. This shows significantly more variation that would be expected by chance alone.

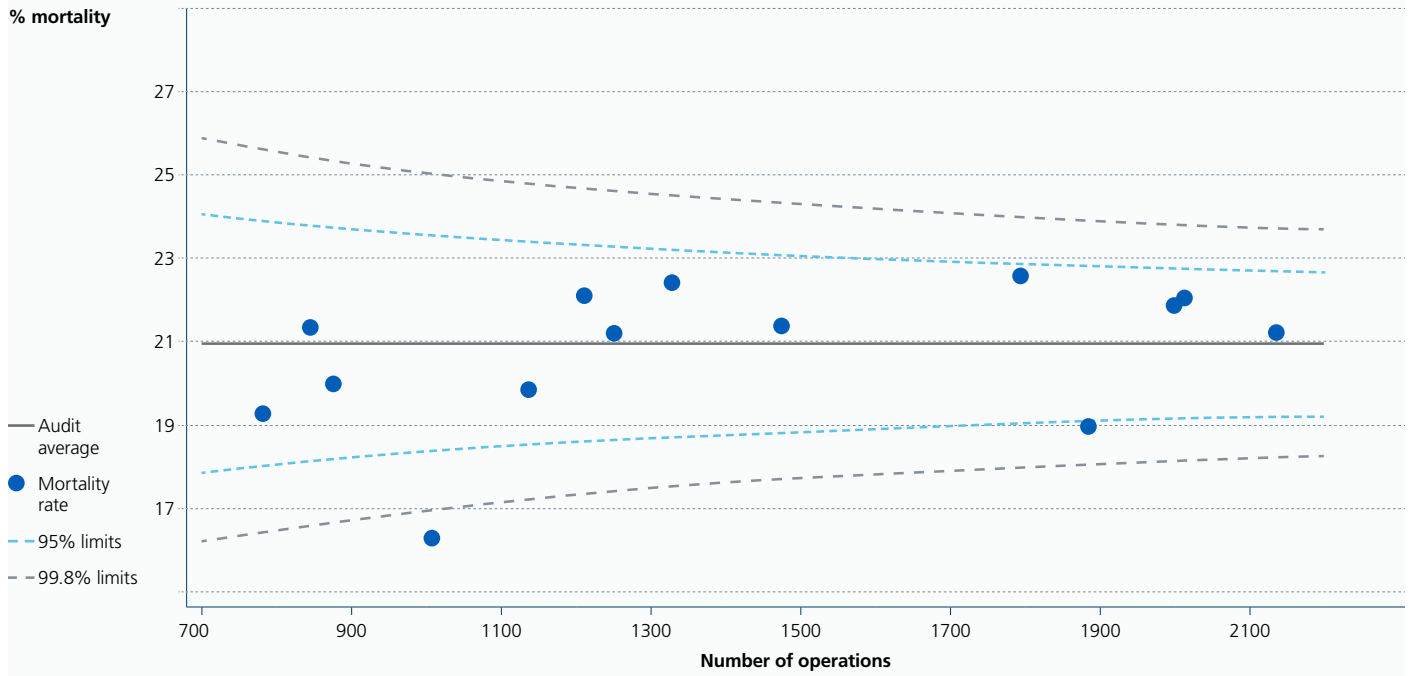
**Figure 5.3**

Observed and adjusted two-year surgical outcomes for patients undergoing a major surgical resection between 1 April 2012 and 31 March 2013, by English strategic clinical network/Wales, including trusts/MDTs with more than ten operations

**Observed two-year mortality rate by network/nation**



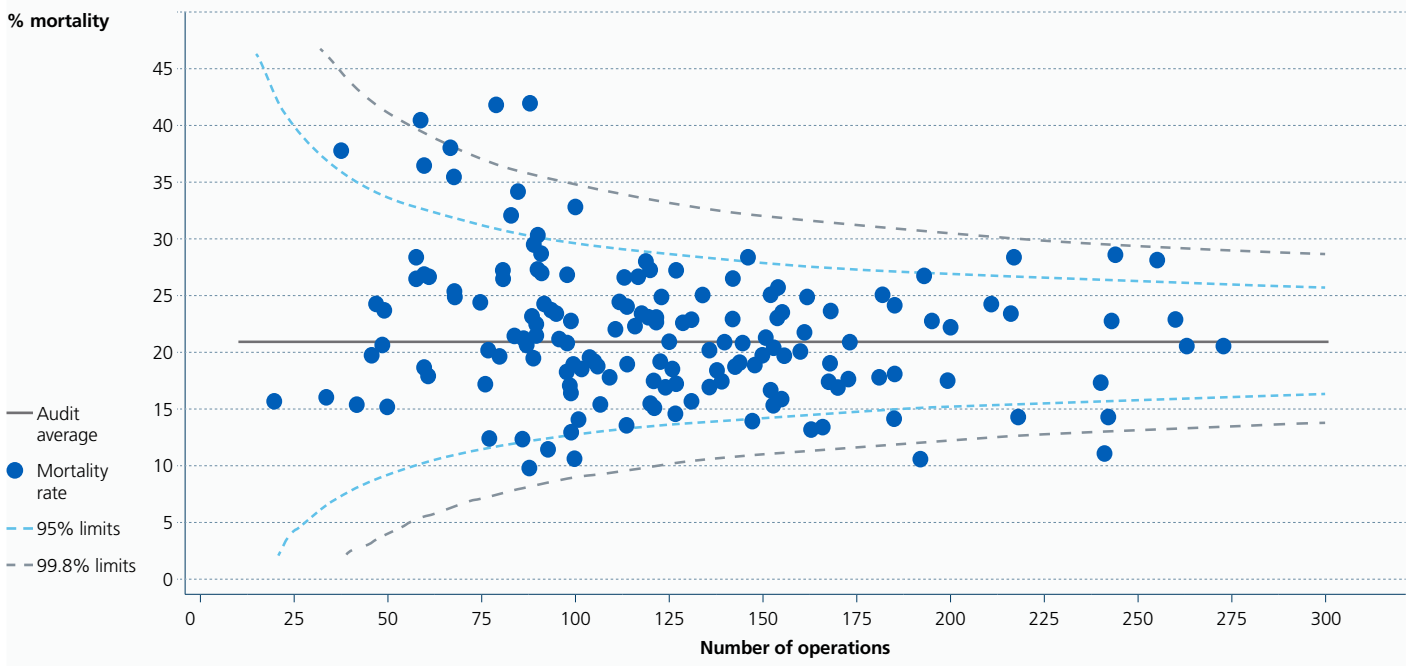
**Adjusted two-year mortality rate by network/nation**



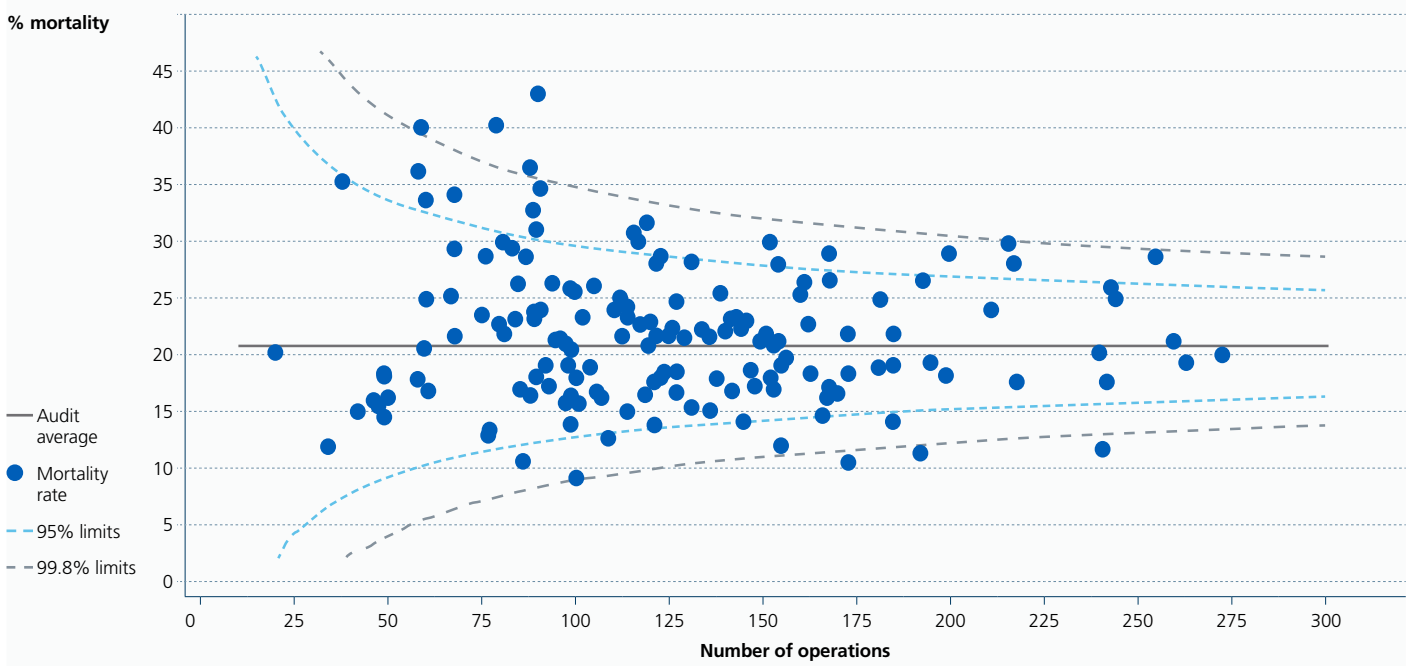
**Figure 5.4**

Observed and adjusted two-year mortality for patients undergoing a major resection between 1 April 2012 and 31 March 2013, by trust/hospital with more than ten operations

**Observed two-year mortality by trust/site with more than 10 operations**



**Adjusted two-year mortality by trust/site with more than 10 operations**



**Recommendations – survival**

- Further work is required into investigating regional variation in rates of two-year survival. This is a priority for the audit moving forward and access to the chemotherapy dataset and cause of death data will facilitate this.
- Patients presenting with stage IV bowel cancer should be referred to MDTs to optimise timing of resection of both the primary tumour and metastases as well as advising on neo-adjuvant and adjuvant treatment.

## 6. Rectal cancer

### Rectal cancer – NBOCA 2016

- 54 per cent of rectal cancer patients underwent major resection and seven per cent underwent a local excision. Just five per cent of rectal cancer patients are managed with a stoma alone.
- 37 per cent of rectal cancer patients undergoing major resection received neo-adjuvant treatment.
- Use of long course radiotherapy in patients undergoing major resection varied from 18 per cent to 46 per cent according to strategic clinical network.
- 83 per cent of rectal cancer patients had a stoma formed at the time of surgical resection.
- 50 per cent of rectal cancer patients undergoing major resection had a stoma at 18 months. There was substantial variation in rates across trusts/sites.

### 6.1 Q: How are patients with rectal cancer treated?

#### Pathways of care

Surgical resection of the rectum remains the foremost intervention for the treatment of rectal cancer, with 54 per cent of rectal cancer patients undergoing major resection (Table 6.1). The proportion of rectal cancer patients who do not undergo surgery or local excision has increased from 27 per cent in 2010-11 to 32 per cent in 2014-15. This may be a more accurate reflection of current practice due to less missing data or may represent the increasing number of patients with a complete response to neo-adjuvant treatment who do not undergo a major resection.

**Table 6.1**  
Management of rectal cancer patients, by audit year

	2010-11		2011-12		2012-13		2013-14		2014-15	
	Number	%	Number	%	Number	%	Number	%	Number	%
<b>Total</b>	8,398		8,798		9,038		8,899		8,884	
<b>Major resection</b>	4,743	56.5	4,769	54.2	4,883	54.0	4,946	55.6	4,769	53.7
<b>Local excision</b>	441	5.3	502	5.7	668	7.4	628	7.1	604	6.8
<b>Non-resectional surgery</b>	935	11.1	870	9.9	817	9.0	663	7.5	664	7.5
<b>No surgery</b>	2,279	27.1	2,657	30.2	2,670	29.5	2,662	29.9	2,847	32.0

For the first time this year, audit data has been linked to the Radiotherapy Dataset. This has enabled more accurate information to be presented regarding neo-adjuvant therapy. Patients were grouped based on methods described previously<sup>3</sup>. In brief, those who had attended a radiotherapy centre four or five times before surgery were allocated to a short course radiotherapy category. Those who attended for radiotherapy 25, 28 or 30 times were deemed to have undergone long course radiotherapy. As explained in section 2.5 the linkage to the Radiotherapy Dataset was high for rectal cancer patients diagnosed up until December 2014 but was poor after this, and therefore the analyses using this data are restricted to patients diagnosed between 1 April and 31 December 2014.

Of all rectal cancer patients undergoing a major resection 38 per cent received neo-adjuvant radiotherapy. 26 per cent patients received long course radiotherapy and 8 per cent patients received short course radiotherapy. Patient characteristics according to pre-surgical treatment type are shown in Table 6.2. Patients receiving long course radiotherapy tended to be younger than those receiving short course radiotherapy or no neo-adjuvant treatment and, as would be expected, a greater proportion had a higher T-stage and nodal involvement.

The median interval from the completion of long course radiotherapy to surgical resection was 12 weeks. Half of patients undergoing long course radiotherapy underwent major resection between six and eight months following diagnosis. Half of patients receiving short course radiotherapy underwent a major resection within eight weeks of diagnosis.

Time to surgery from completion of radiotherapy and association outcomes will be further investigated as part of a supplementary report due to be published in 2017.

Table 6.2

Patient characteristics by treatment type, for 3,608 rectal cancer patients diagnosed between 1 April 2014 and 31 December 2014 who underwent a major resection

		No pre-op treatment recorded		Long Course RT pre surgery		Short course RT pre surgery		Other treatment pre surgery*	
		Number	%	Number	%	Number	%	Number	%
<b>Total rectal cancer patients</b>		<b>2,169</b>		<b>1,009</b>		<b>303</b>		<b>127</b>	
<b>Sex</b>	<b>Male</b>	1,385	63.9	651	64.5	213	70.3	81	63.8
	<b>Female</b>	784	36.1	358	35.5	90	29.7	46	36.2
<b>Age-group</b>	<b>≤65 years</b>	757	34.9	487	48.3	102	33.7	57	44.9
	<b>65-74 years</b>	733	33.8	318	31.5	107	35.3	48	37.8
	<b>75-84 years</b>	580	26.7	196	19.4	80	26.4	21	16.5
	<b>85+ years</b>	99	4.6	8	0.8	14	4.6	1	0.8
<b>Pre-treatment TNM T-stage</b>	<b>T1</b>	104	4.8	7	0.7	11	3.6	0	0.0
	<b>T2</b>	831	38.3	91	9.0	55	18.2	22	17.3
	<b>T3</b>	952	43.9	687	68.1	214	70.6	73	57.5
	<b>T4</b>	91	4.2	187	18.5	8	2.6	24	18.9
	<b>TX</b>	48	2.2	5	0.5	0	0.0	2	1.6
	<b>T9</b>	143	6.6	32	3.2	15	5.0	6	4.7
<b>Pre-treatment TNM N-stage</b>	<b>N0</b>	1,231	56.8	210	20.8	105	34.7	34	26.8
	<b>N1</b>	584	26.9	390	38.7	126	41.6	56	44.1
	<b>N2</b>	151	7.0	358	35.5	51	16.8	27	21.3
	<b>Nx</b>	37	1.7	12	1.2	3	1.0	3	2.4
	<b>N9</b>	166	7.7	39	3.9	18	5.9	7	5.5
<b>Pre-treatment TNM M-stage</b>	<b>M0</b>	1,738	80.1	844	83.6	238	78.5	88	69.3
	<b>M1</b>	88	4.1	63	6.2	20	6.6	24	18.9
	<b>Mx</b>	134	6.2	56	5.6	19	6.3	5	3.9
	<b>M9</b>	209	9.6	46	4.6	26	8.6	10	7.9
<b>Time to surgery</b>	<b>Within 2 months</b>	1,725	81.1	33	3.3	143	48.1	31	25.6
	<b>2-4 months</b>	346	16.3	17	1.7	84	28.3	10	8.3
	<b>4-6 months</b>	24	1.1	369	36.9	19	6.4	27	22.3
	<b>6-8 months</b>	13	0.6	451	45.1	39	13.1	30	24.8
	<b>&gt; 8 months</b>	19	0.9	131	13.1	12	4.0	23	19.0
	<b>Missing (% of total)</b>	42 (1.9)		8 (0.8)		6 (2.0)		6 (4.7)	
<b>Mode of admission (from HES)</b>	<b>Elective</b>	1,862	95.6	867	95.4	246	94.6	111	94.9
	<b>Emergency</b>	85	4.4	42	4.6	14	5.4	6	5.1
	<b>Missing (% of total)†</b>	222 (10.2)		100 (9.9)		43 (14.2)		10 (7.9)	
<b>Co-morbidities (from HES)</b>	<b>0</b>	1,196	61.4	582	64.0	160	61.5	88	75.2
	<b>1</b>	528	27.1	251	27.6	69	26.5	22	18.8
	<b>2+</b>	223	11.5	77	8.5	31	11.9	7	6
	<b>Missing (% of total)†</b>	222 (10.2)		99 (9.8)		43 (14.2)		10 (7.9)	

\* Chemotherapy, brachytherapy or radiotherapy that cannot be classified into our definitions of long/short course

† includes patients from Wales who could not be linked to Welsh equivalent of HES (PEDW)

Patient characteristics in those who do not undergo major resection are presented in Table 6.3. Seven per cent of patients with rectal cancer were definitively managed with a local excision procedure and five per cent were managed with a stoma alone.

**Table 6.3**  
Patient characteristics by treatment type, for 3,027 rectal cancer patients diagnosed between 1 April 2014 and 31 December 2014 who did not undergo major resection

	Local Excision		Stoma		Other surgery		No Surgery*		
	Number	%	Number	%	Number	%	Number	%	
<b>Total rectal cancer patients</b>	<b>443</b>		<b>343</b>		<b>125</b>		<b>2,116</b>		
<b>Sex</b>	<b>Male</b>	272	61.4	207	60.3	73	58.4	1,338	63.2
	<b>Female</b>	171	38.6	136	39.7	52	41.6	778	36.8
<b>Age-group</b>	<b>≤65 years</b>	121	27.3	121	35.3	41	32.8	509	24.1
	<b>65-74 years</b>	149	33.6	95	27.7	34	27.2	516	24.4
	<b>75-84 years</b>	121	27.3	96	28.0	36	28.8	637	30.1
	<b>85+ years</b>	52	11.7	31	9.0	14	11.2	454	21.5
<b>Pre-treatment TNM T-stage</b>	<b>T1</b>	150	33.9	0	0.0	14	11.2	35	1.7
	<b>T2</b>	118	26.6	17	5.0	18	14.4	271	12.8
	<b>T3</b>	23	5.2	134	39.1	36	28.8	928	43.9
	<b>T4</b>	1	0.2	151	44.0	30	24.0	419	19.8
	<b>TX</b>	50	11.3	10	2.9	10	8.0	89	4.2
	<b>T9</b>	101	22.8	31	9.0	17	13.6	374	17.7
<b>Pre-treatment TNM N-stage</b>	<b>N0</b>	284	64.1	54	15.7	45	36.0	539	25.5
	<b>N1</b>	19	4.3	104	30.3	37	29.6	608	28.7
	<b>N2</b>	5	1.1	140	40.8	21	16.8	489	23.1
	<b>Nx</b>	30	6.8	11	3.2	5	4.0	92	4.3
	<b>N9</b>	105	23.7	34	9.9	17	13.6	388	18.3
<b>Pre-treatment TNM M-stage</b>	<b>M0</b>	313	70.7	155	45.2	78	62.4	945	44.7
	<b>M1</b>	4	0.9	141	41.1	19	15.2	707	33.4
	<b>Mx</b>	29	6.5	20	5.8	9	7.2	106	5.0
	<b>M9</b>	97	21.9	27	7.9	19	15.2	358	16.9
<b>Time to surgery</b>	<b>Within 2 months</b>	332	82.2	281	83.6	76	62.3	29	81.0
	<b>2-4 months</b>	36	8.9	29	8.6	11	9.0	3	8.0
	<b>4-6 months</b>	13	3.2	6	1.8	5	4.1	2	6.0
	<b>6-8 months</b>	13	3.2	10	3.0	12	9.8	0	0.0
	<b>&gt; 8 months</b>	10	2.5	10	3.0	18	14.8	2	6.0
	<b>Missing (% of total)</b>	39 (8.8)		7 (2.0)		3 (2.4)		2,080 (98.3)	
<b>Mode of admission (from HES)</b>	<b>Elective</b>	306	96.8	224	79.2	77	86.5	1,328	80.6
	<b>Emergency</b>	10	3.2	59	20.8	12	13.5	319	19.4
	<b>Missing (% of total)</b>	127 (28.7)		60 (17.5)		36 (28.8)		469 (22.2)	
<b>Co-morbidities (from HES)</b>	<b>0</b>	177	56.0	153	54.1	48	54.5	938	57.1
	<b>1</b>	81	25.6	101	35.7	26	29.5	432	26.3
	<b>2+</b>	58	18.4	29	10.2	14	15.9	273	16.6
	<b>Missing (% of total)</b>	127 (28.7)		60 (17.5)		37 (29.6)		473 (22.4)	
<b>Initial Treatment</b>	<b>None</b>	400	90.3	252	73.5	86	68.8	839	39.7
	<b>Long Course</b>	14	3.2	41	12.0	25	20.0	479	22.6
	<b>Short Course</b>	25	5.6	21	6.1	5	4.0	366	17.3
	<b>Other RT (including Brachytherapy)</b>	2	0.5	5	1.5	2	1.6	195	9.2
	<b>Chemotherapy</b>	2	0.5	24	7.0	7	5.6	237	11.2

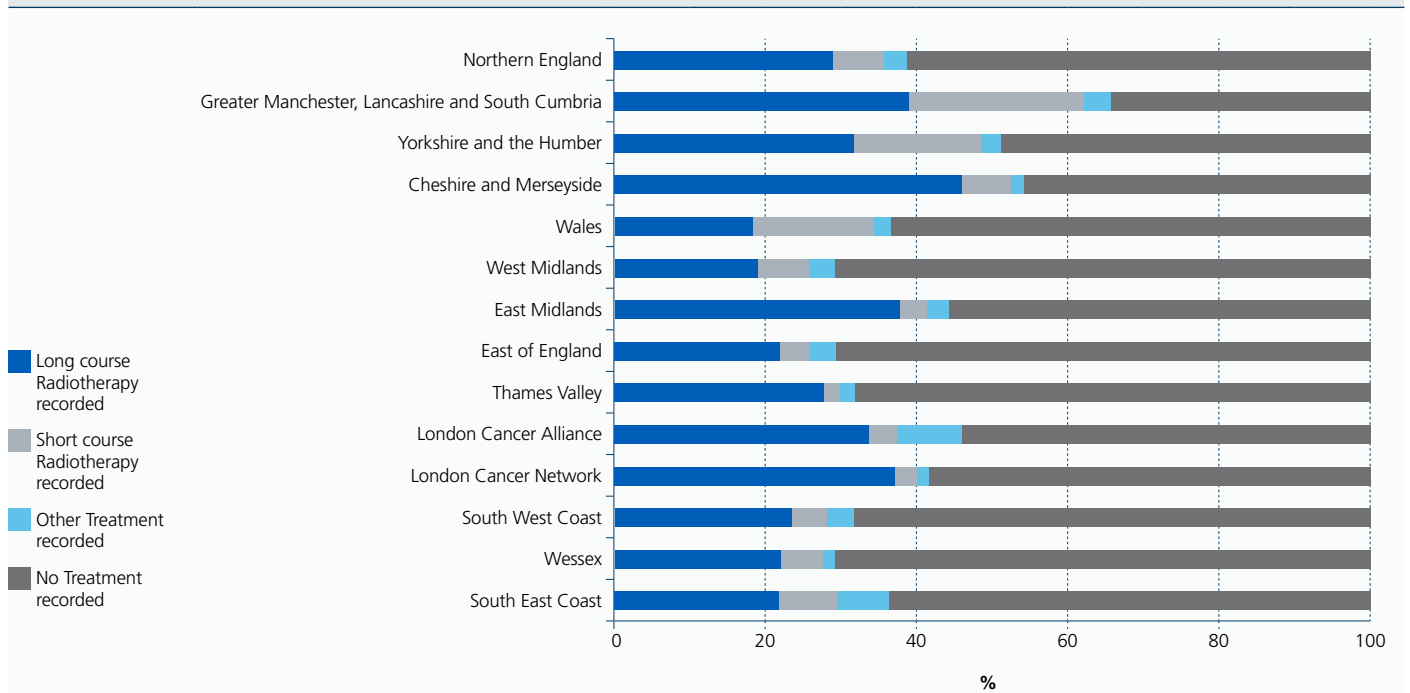
\* No Surgery includes 38 patients whose surgical procedure is recorded as a stent

## Geographical variation in the use of neo-adjuvant radiotherapy

The use of neo-adjuvant treatment according to strategic clinical network is presented in [Figure 6.1](#). The regional variation reported, although still substantial, has reduced following the linkage of audit data to the Radiotherapy Dataset (RTDS). Use of long course radiotherapy ranged from 18 per cent of patients undergoing major resection in Wales to 46 per cent in Cheshire and Merseyside. The use of short course radiotherapy also ranged widely from 2 per cent in Thames Valley to 23 per cent in Greater Manchester, Lancashire and Cumbria. The use of other treatment recorded ranged from 0 per cent in Thames Valley to 10 per cent in Greater Manchester, Lancashire and Cumbria. The use of no treatment recorded ranged from 0 per cent in Thames Valley to 46 per cent in Cheshire and Merseyside.

RTDS was only linked to English data and therefore the reported use of radiotherapy in Wales is from audit data alone, which could contribute to the observed differences between English and Welsh trusts.

**Figure 6.1**  
Treatment pathways of the 3,608 rectal cancer patients undergoing major resection by strategic clinical network performing surgery, for patients diagnosed between 1 April 2014 and 31 December 2014



## 6.2 Q: How are stomas used in rectal cancer surgery and how often are 'temporary' stomas reversed?

### Presence of stoma

From 2011-2014, 83 per cent of rectal cancer patients had a stoma formed at the time of surgical resection (Table 6.4). In addition to all patients undergoing APER and Hartmann's, around 77 per cent of anterior resections were covered by a stoma. Within 18 months, 66 per cent of patients with a stoma following anterior resection had undergone stoma reversal.

### Geographical variation in stoma reversal

To make comparisons between strategic clinical networks (Figure 6.2) and between trusts/hospitals (Figure 6.3), 18-month stoma rates for all resectional surgery (APER, Hartmann's and anterior resection) were adjusted for case-mix using the same risk factors as for 90-day mortality (except cancer site). Data were pooled over three years to ensure sufficient numbers of operations per trusts to make comparisons. It is only the 2013 and 2016 Annual Report which have no overlap in the data reported.

Overall, 50 per cent of rectal cancer patients undergoing major resection had a stoma at 18 months. There was considerable variation in adjusted 18-month stoma rates between strategic clinical networks, with two falling above the outer limits. Both of these networks were also outliers in the 2013 Annual Report. There was one network below the lower limit. In this network, five out of nine trusts were below either the inner or outer limits.

The variation by trust/hospital site was also large, with nine falling above outer limits, of which two were also outliers in 2013. A further 11 trusts/hospitals fell above the inner limits.

This analysis of stoma at 18 months includes all surgical resections for rectal cancer (abdominoperineal excision of the rectum, Hartmann's and anterior resection). Therefore variation is likely to reflect differences in practice with respect to patient selection for permanent stoma, use of adjuvant chemotherapy and local service prioritisation of stoma closure.

All strategic clinical networks and trusts/hospitals falling above the outer funnel limits have been informed. Please see details of their responses in Appendix 1.

**Table 6.4**

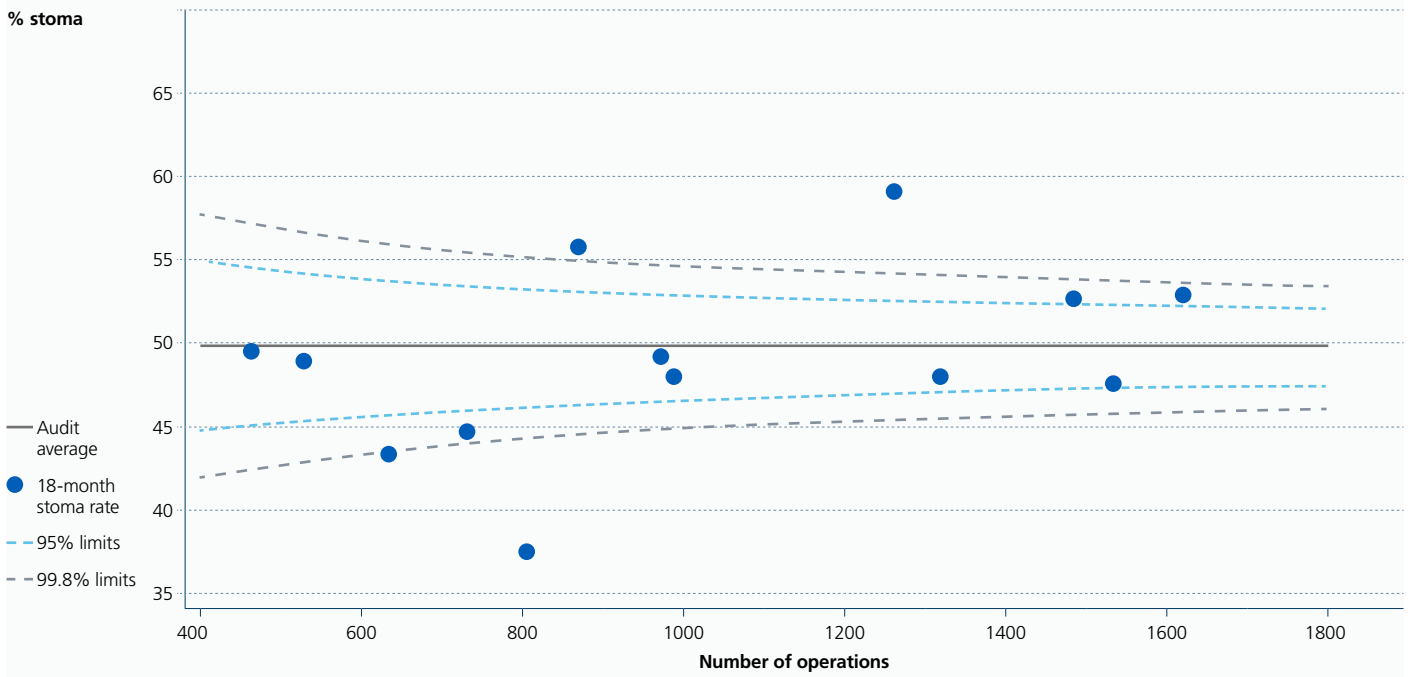
Description of stoma types by procedure for 13,189 rectal cancer patients linked to HES having a major resection between 1 April 2011 and 31 March 2014 at English NHS trusts, by procedure

		AR		APER		Hartmann's		Other	
		Number	%	Number	%	Number	%	Number	%
<b>Total rectal cancer patients undergoing major resection</b>		<b>8,549</b>		<b>3,240</b>		<b>1,062</b>		<b>338</b>	
<b>Any stoma</b>	<b>No</b>	1,988	23.3	0	0.0	0	0.0	247	73.1
	<b>Yes</b>	6,561	76.7	3,240	100.0	1,062	100.0	91	26.9
<b>Stoma location</b>	<b>None</b>	1,988	23.3	0	0.0	0	0.0	247	73.1
	<b>Ileostomy</b>	5,406	63.2	77	2.4	114	10.7	64	18.9
	<b>Colostomy</b>	1,155	13.5	3,163	97.6	948	89.3	27	8.0
<b>Stoma at 18 months, ignoring deaths</b>	<b>No</b>	6,287	73.5	0	0.0	73	6.9	263	77.8
	<b>Yes</b>	2,262	26.5	3,240	100.0	989	93.1	75	22.2

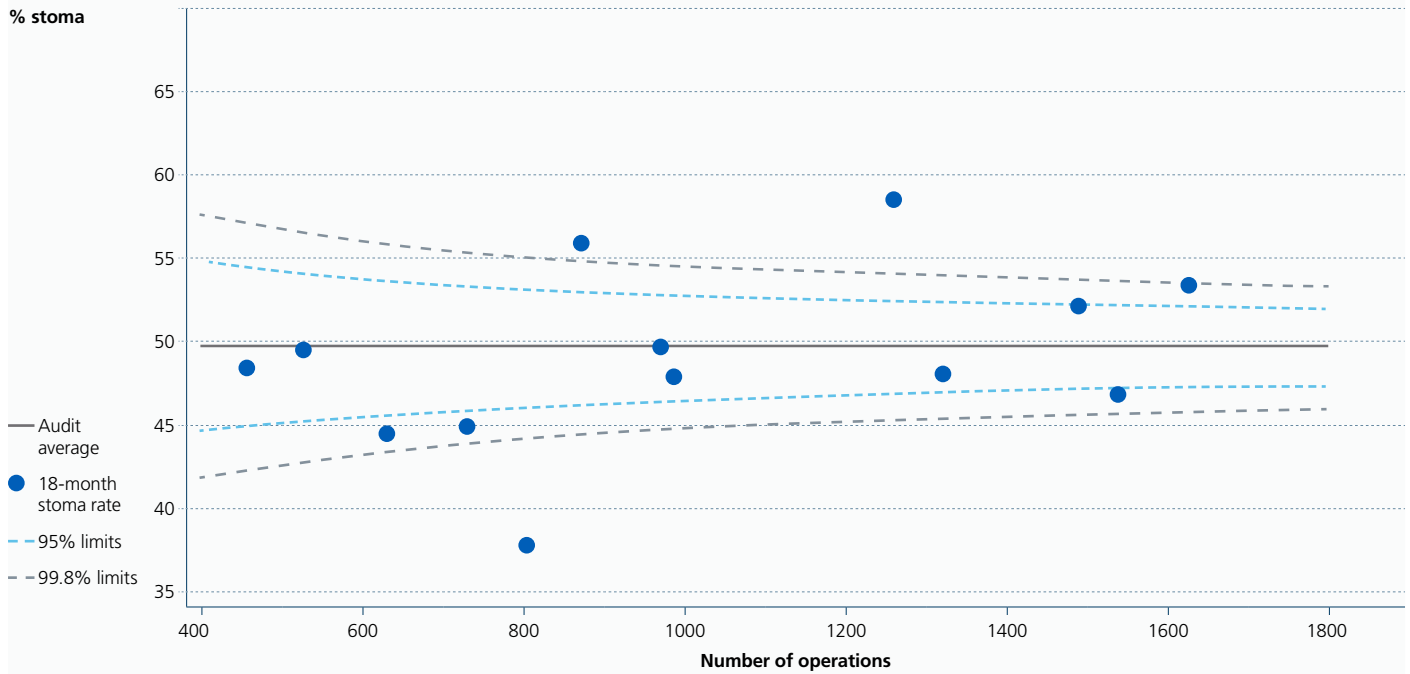
**Figure 6.2**

**Observed and adjusted 18-month stoma rate by English strategic clinical network\* for rectal cancer patients undergoing a major resection between 1 April 2011 and 31 March 2014**

**Observed 18-month stoma rate by network**



**Adjusted 18-month stoma rate by network**

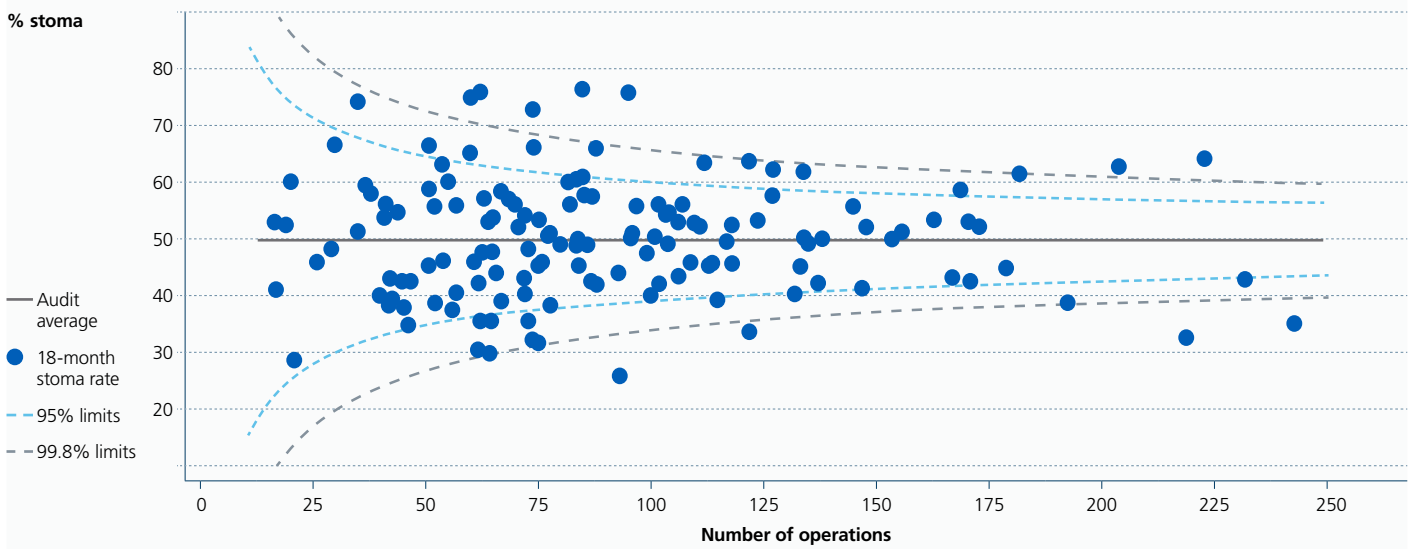


\*Equivalent data (PEDW) not available for Wales

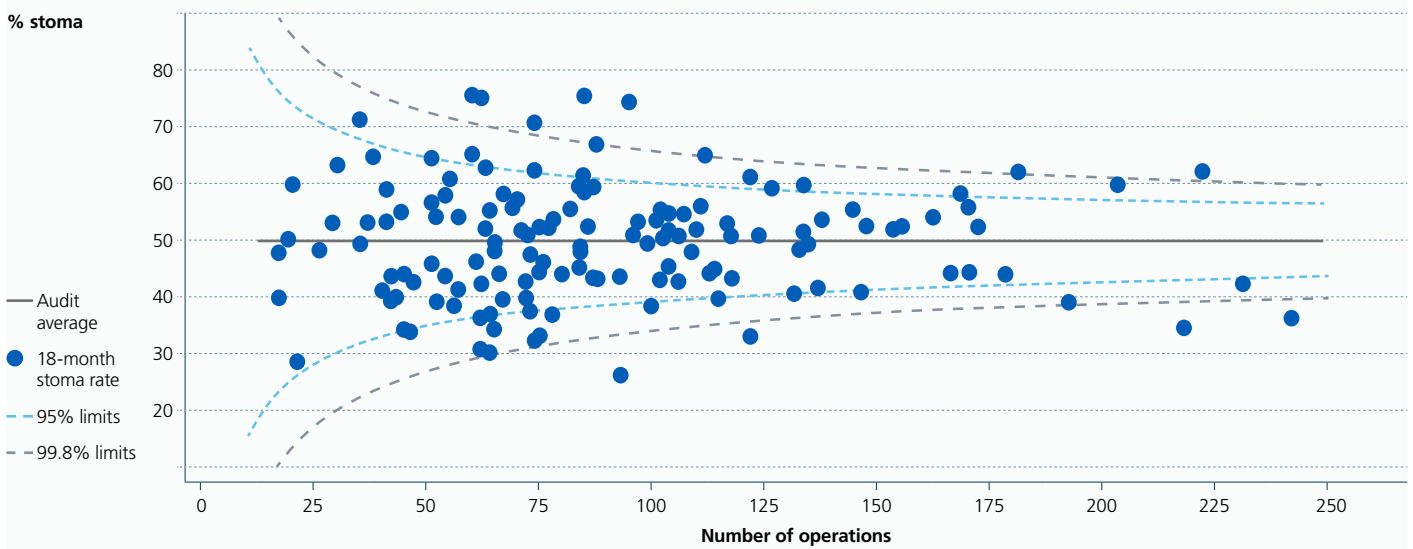
Figure 6.3

Observed and adjusted 18-month stoma rate by English trust/hospital for rectal cancer patients undergoing a major resection between 1 April 2011 and 31 March 2014

Observed 18-month stoma rate by trust/site with more than 10 operations



Adjusted 18-month stoma rate by trust/site with more than 10 operations



## Recommendations – rectal cancer

- In the future the audit will correlate radiotherapy use to rates of positive circumferential resection margins and local recurrence in rectal cancer patients undergoing major resection. To facilitate this, clinicians should aim to ensure complete data for circumferential resection margin.
- Clinicians should ensure that patients undergoing an anterior resection are aware that data suggests that in a significant proportion of patients a 'temporary' stoma may not be reversed within 18 months.

## 7. Bowel Cancer Management – trust by trust

The Royal Marsden, Clatterbridge Centre for Oncology NHS Foundation trust and The Christie Hospital NHS Foundation trust are tertiary cancer centres that mainly provide oncological treatment for bowel cancer patients. The Royal Marsden and The Christie Hospital NHS Foundation trust have been excluded from Case Ascertainment in this table. Clatterbridge Centre for Oncology NHS Foundation trust has been excluded from all data in this table

Key	
Audit year	
● >80% case ascertainment or data completeness	
■ 50-80% case ascertainment or data completeness	
▲ <50% case ascertainment or data completeness	

**Table 7.1**  
Case ascertainment and data completeness according to trust/hospital site

Network/Trust Name	No. cases reported to the Audit (total excludes Wales)	No. cases identified in HES	Case ascertainment %	Patients with complete pre-treatment staging (%)*	Patients with recorded performance status (%)+	No. cases having major surgery according to the Audit	Data completeness for patients having major surgery %	Patients having major surgery recorded as ASA 1 (%)	Patients having major surgery recorded as ASA 2 (%)	Patients having major surgery recorded as ASA 3 (%)	Patients having major surgery recorded as ASA 4/5 (%)	Patients having major surgery with no ASA recorded (%)
<b>Overall</b>	<b>28,013</b>	<b>30,230</b>	<b>93 ●</b>	<b>71 ■</b>	<b>77 ■</b>	<b>18,809</b>	<b>82 ●</b>	<b>14</b>	<b>53</b>	<b>25</b>	<b>3</b>	<b>5</b>
<b>Northern England</b>	<b>1,895</b>	<b>1,992</b>	<b>95 ●</b>	<b>74 ■</b>	<b>76 ■</b>	<b>1,267</b>	<b>89 ●</b>	<b>9</b>	<b>49</b>	<b>35</b>	<b>5</b>	<b>2</b>
City Hospitals Sunderland NHS Foundation Trust	184	200	92 ●	66 ■	100 ●	134	73 ■	8	59	28	5	0
County Durham and Darlington NHS Foundation Trust	281	298	94 ●	46 ▲	87 ●	195	92 ●	7	47	38	5	3
Gateshead Health NHS Foundation Trust	156	158	99 ●	36 ▲	17 ▲	87	24 ▲	7	33	41	7	11
North Cumbria University Hospitals NHS Trust	206	251	82 ●	73 ■	59 ■	138	94 ●	7	49	43	2	0
North Tees and Hartlepool NHS Foundation Trust	219	209	105 ●	96 ●	94 ●	121	100 ●	11	48	36	5	0
Northumbria Healthcare NHS Foundation Trust	277	297	93 ●	88 ●	66 ■	192	99 ●	9	60	25	4	1
South Tees Hospitals NHS Foundation Trust	279	269	104 ●	73 ■	64 ■	190	93 ●	17	44	29	4	5
South Tyneside NHS Foundation Trust	85	88	97 ●	91 ●	99 ●	50	98 ●	8	42	44	6	0
The Newcastle upon Tyne Hospitals NHS Foundation Trust	206	222	93 ●	97 ●	99 ●	160	99 ●	7	47	41	5	1
<b>Greater Manchester, Lancashire and South Cumbria</b>	<b>2,626</b>	<b>2,685</b>	<b>98 ●</b>	<b>80 ●</b>	<b>88 ●</b>	<b>1,599</b>	<b>91 ●</b>	<b>14</b>	<b>53</b>	<b>29</b>	<b>3</b>	<b>1</b>
Blackpool Teaching Hospitals NHS Foundation Trust	269	193	139 ●	86 ●	74 ■	110	94 ●	16	61	21	1	1
Bolton NHS Foundation Trust	175	178	98 ●	87 ●	99 ●	116	95 ●	9	54	28	5	3
Central Manchester University Hospitals NHS Foundation Trust	168	157	107 ●	80 ●	100 ●	80	100 ●	45	41	14	0	0
East Cheshire NHS Trust	113	99	114 ●	91 ●	100 ●	72	96 ●	7	67	17	10	0
East Lancashire Hospitals NHS Trust	209	222	94 ●	78 ■	91 ●	148	98 ●	24	43	30	3	0
Lancashire Teaching Hospitals NHS Foundation Trust	219	276	79 ■	92 ●	100 ●	135	91 ●	10	49	31	2	7
Mid Cheshire Hospitals NHS Foundation Trust	147	195	75 ■	86 ●	99 ●	93	88 ●	2	71	27	0	0
Pennine Acute Hospitals NHS Trust	354	351	101 ●	88 ●	100 ●	213	85 ●	14	57	26	3	0
Salford Royal NHS Foundation Trust	106	122	87 ●	67 ■	61 ■	77	94 ●	13	53	30	4	0
Stockport NHS Foundation Trust	189	185	102 ●	81 ●	67 ■	109	87 ●	8	45	43	4	0
Tameside Hospital NHS Foundation Trust	112	115	97 ●	72 ■	94 ●	71	96 ●	6	48	44	3	0
The Christie NHS Foundation Trust	–	–	–	–	–	67	100 ●	25	63	10	1	0
University Hospital of South Manchester NHS Foundation Trust	136	139	98 ●	74 ■	74 ■	94	99 ●	13	41	44	1	1
University Hospitals of Morecambe Bay NHS Foundation Trust	248	230	108 ●	42 ▲	70 ■	140	68 ■	10	56	30	4	0
Wrightington, Wigan and Leigh NHS Foundation Trust	161	125	129 ●	92 ●	100 ●	74	88 ●	5	51	32	4	7
<b>Yorkshire and the Humber</b>	<b>3,008</b>	<b>3,189</b>	<b>94 ●</b>	<b>71 ■</b>	<b>77 ■</b>	<b>1,893</b>	<b>85 ■</b>	<b>20</b>	<b>52</b>	<b>22</b>	<b>3</b>	<b>4</b>
Airedale NHS Foundation Trust	132	130	102 ●	98 ●	99 ●	79	100 ●	87	11	0	1	0
Barnsley Hospital NHS Foundation Trust	125	131	95 ●	29 ▲	53 ■	68	78 ■	13	54	13	1	18
Bradford Teaching Hospitals NHS Foundation Trust	155	183	85 ●	75 ■	80 ●	108	94 ●	0	97	2	0	1
Calderdale and Huddersfield NHS Foundation Trust	235	206	114 ●	73 ■	7 ▲	109	95 ●	12	59	25	1	4
Chesterfield Royal Hospital NHS Foundation Trust	192	191	101 ●	78 ■	78 ■	122	93 ●	20	53	22	1	4
Doncaster and Bassetlaw Hospitals NHS Foundation Trust	196	264	74 ■	30 ▲	38 ▲	128	73 ■	9	64	24	2	2
Harrogate and District NHS Foundation Trust	149	131	114 ●	68 ■	93 ●	84	100 ●	17	67	15	1	0
Hull and East Yorkshire Hospitals NHS Trust	327	315	104 ●	67 ■	100 ●	190	44 ▲	26	36	24	3	11
Leeds Teaching Hospitals NHS Trust	291	315	92 ●	85 ●	42 ▲	212	95 ●	11	49	33	7	0
Mid Yorkshire Hospitals NHS Trust	274	306	90 ●	60 ■	85 ●	173	73 ■	51	36	3	1	9
Northern Lincolnshire and Goole NHS Foundation Trust	192	243	79 ■	83 ●	98 ●	150	77 ■	10	43	36	5	6
Sheffield Teaching Hospitals NHS Foundation Trust	272	302	90 ●	83 ●	100 ●	174	98 ●	10	60	28	2	0
The Rotherham NHS Foundation Trust	125	128	98 ●	91 ●	100 ●	74	100 ●	19	54	23	4	0
York Teaching Hospital NHS Foundation Trust – Scarborough Hospital	115	109	106 ●	83 ●	100 ●	60	93 ●	3	52	37	7	2
York Teaching Hospital NHS Foundation Trust – The York Hospital	223	235	95 ●	65 ■	98 ●	156	99 ●	15	56	26	3	1

**Table 7.1 (continued)**  
Case ascertainment and data completeness according to trust/hospital site

Network/Trust Name	No. cases reported to the Audit (total excludes Wales)	No. cases identified in HES	Case ascertainment %	Patients with complete pre-treatment staging (%)*	Patients with recorded performance status (%)+	No. cases having major surgery according to the Audit	Data completeness for patients having major surgery %	Patients having major surgery recorded as ASA 1 (%)	Patients having major surgery recorded as ASA 2 (%)	Patients having major surgery recorded as ASA 3 (%)	Patients having major surgery recorded as ASA 4/5 (%)	Patients having major surgery with no ASA recorded (%)
<b>Cheshire and Merseyside</b>	<b>1,250</b>	<b>1,259</b>	<b>99</b> ●	<b>77</b> ■	<b>88</b> ●	<b>719</b>	<b>83</b> ●	<b>14</b>	<b>55</b>	<b>24</b>	<b>6</b>	<b>1</b>
Aintree University Hospital NHS Foundation Trust	237	209	113 ●	71 ■	88 ●	109	92 ●	11	53	33	2	1
Countess of Chester Hospital NHS Foundation Trust	148	172	86 ●	84 ●	100 ●	107	96 ●	14	63	3	21	0
Royal Liverpool and Broadgreen University Hospitals NHS Trust	183	182	101 ●	93 ●	91 ●	111	95 ●	14	63	22	1	0
Southport and Ormskirk Hospital NHS Trust	118	107	110 ●	73 ■	36 ▲	71	54 ■	15	46	28	6	4
St Helens and Knowsley Hospitals NHS Trust	199	206	97 ●	60 ■	97 ●	138	75 ■	11	56	26	7	0
Warrington and Halton Hospitals NHS Foundation Trust	152	150	101 ●	74 ■	84 ●	87	79 ■	21	49	29	0	1
Wirral University Teaching Hospital NHS Foundation Trust	210	216	97 ●	89 ●	100 ●	96	84 ●	13	53	31	3	0
<b>Wales</b>	<b>2,108</b>	<b>N/A</b>	<b>N/A</b>	<b>65</b> ■	<b>33</b> ▲	<b>1,320</b>	<b>78</b> ■	<b>7</b>	<b>55</b>	<b>32</b>	<b>3</b>	<b>2</b>
Bronglais MDT	51	N/A	N/A	55 ■	71 ■	10	40 ▲	10	30	50	10	0
Cardiff MDT	254	N/A	N/A	70 ■	2 ▲	152	78 ■	3	61	32	1	3
Nevill Hall Hospital MDT	123	N/A	N/A	85 ●	96 ●	74	95 ●	9	50	38	1	1
Prince Charles Hospital MDT	109	N/A	N/A	94 ●	100 ●	87	97 ●	0	52	43	6	0
Princess of Wales MDT	204	N/A	N/A	26 ▲	2 ▲	119	39 ▲	10	58	28	4	0
Royal Glamorgan Hospital MDT	124	N/A	N/A	56 ■	64 ■	71	92 ●	10	58	30	3	0
Royal Gwent Hospital MDT	259	N/A	N/A	81 ●	67 ■	170	100 ●	8	54	35	4	0
Swansea MDT	192	N/A	N/A	73 ■	2 ▲	152	84 ●	5	65	25	1	4
West Wales General & Prince Phillip MDT	156	N/A	N/A	77 ■	59 ■	86	80 ●	8	52	35	3	1
Withybush General MDT	111	N/A	N/A	68 ■	49 ▲	74	81 ●	15	55	26	1	3
Ysbwyty Glan Clwydd MDT	157	N/A	N/A	37 ▲	1 ▲	94	48 ▲	5	52	34	6	2
Ysbwyty Gwynedd MDT	172	N/A	N/A	31 ▲	3 ▲	116	54 ■	10	47	28	6	9
Ysbwyty Maelor MDT	196	N/A	N/A	87 ●	6 ▲	115	98 ●	10	51	35	4	0
<b>West Midlands</b>	<b>3,058</b>	<b>3,175</b>	<b>96</b> ●	<b>72</b> ■	<b>78</b> ■	<b>1,920</b>	<b>74</b> ■	<b>13</b>	<b>52</b>	<b>25</b>	<b>3</b>	<b>7</b>
George Eliot Hospital NHS Trust	90	96	94 ●	72 ■	99 ●	61	97 ●	2	59	36	3	0
Heart of England NHS Foundation Trust	400	400	100 ●	91 ●	100 ●	249	95 ●	11	63	23	2	0
Sandwell and West Birmingham Hospitals NHS Trust	202	154	131 ●	52 ■	33 ▲	114	86 ●	10	39	38	8	6
Shrewsbury and Telford Hospital NHS Trust	388	382	102 ●	66 ■	93 ●	241	62 ■	18	51	22	1	8
South Warwickshire NHS Foundation Trust	126	127	99 ●	64 ■	2 ▲	77	99 ●	18	51	30	1	0
The Dudley Group NHS Foundation Trust	199	203	98 ●	79 ■	99 ●	117	71 ■	18	51	27	3	1
The Royal Wolverhampton NHS Trust	264	257	103 ●	86 ●	90 ●	165	85 ●	10	52	30	6	2
University Hospitals Birmingham NHS Foundation Trust	122	186	66 ■	52 ■	100 ●	84	63 ■	33	55	6	2	4
University Hospitals Coventry and Warwickshire NHS Trust	226	257	88 ●	38 ▲	70 ■	137	74 ■	15	45	35	4	1
University Hospitals of North Midlands NHS Trust – County Hospital	65	78	83 ●	20 ▲	14 ▲	32	3 ▲	0	3	0	0	97
University Hospitals of North Midlands NHS Trust – Royal Stoke University Hospital	279	370	75 ■	78 ■	95 ●	193	31 ▲	7	44	16	3	30
Walsall Healthcare NHS Trust	115	136	85 ●	63 ■	97 ●	83	72 ■	11	45	37	4	4
Worcestershire Acute Hospitals NHS Trust	421	393	107 ●	86 ●	54 ■	264	87 ●	10	64	25	1	0
Wye Valley NHS Trust	159	136	117 ●	85 ●	89 ●	102	76 ■	16	51	25	0	8
<b>East Midlands</b>	<b>2,135</b>	<b>2,334</b>	<b>91</b> ●	<b>65</b> ■	<b>64</b> ■	<b>1,304</b>	<b>87</b> ●	<b>13</b>	<b>59</b>	<b>22</b>	<b>2</b>	<b>4</b>
Burton Hospitals NHS Foundation Trust	149	154	97 ●	89 ●	100 ●	106	100 ●	13	65	20	2	0
Derby Hospitals NHS Foundation Trust	326	334	98 ●	46 ▲	42 ▲	177	66 ■	14	55	19	2	10
Kettering General Hospital NHS Foundation Trust	217	218	100 ●	86 ●	100 ●	131	95 ●	35	47	16	1	2
Northampton General Hospital NHS Trust	125	181	69 ■	60 ■	89 ●	96	89 ●	20	47	22	0	11
Nottingham University Hospitals NHS Trust	284	313	91 ●	99 ●	100 ●	244	96 ●	0	67	25	3	4
Sherwood Forest Hospitals NHS Foundation Trust	198	198	100 ●	25 ▲	17 ▲	115	59 ■	20	50	17	3	10
United Lincolnshire Hospitals NHS Trust	264	388	68 ■	34 ▲	92 ●	179	80 ●	15	63	22	0	1
University Hospitals of Leicester NHS Trust	430	418	103 ●	67 ■	11 ▲	256	100 ●	6	62	29	4	0

**Table 7.1 (continued)**  
**Case ascertainment and data completeness according to trust/hospital site**

Network/Trust Name	No. cases reported to the Audit (total excludes Wales)	No. cases identified in HES	Case ascertainment %	Patients with complete pre-treatment staging (%)*	Patients with recorded performance status (%)+	No. cases having major surgery according to the Audit	Data completeness for patients having major surgery %	Patients having major surgery recorded as ASA 1 (%)	Patients having major surgery recorded as ASA 2 (%)	Patients having major surgery recorded as ASA 3 (%)	Patients having major surgery recorded as ASA 4/5 (%)	Patients having major surgery with no ASA recorded (%)
<b>East of England</b>	<b>3,150</b>	<b>3,236</b>	<b>97</b> ●	<b>54</b> ■	<b>64</b> ■	<b>1,907</b>	<b>70</b> ■	<b>10</b>	<b>53</b>	<b>24</b>	<b>3</b>	<b>9</b>
Basildon and Thurrock University Hospitals NHS Foundation Trust	221	185	119 ●	67 ■	81 ●	135	91 ●	13	44	30	5	7
Bedford Hospital NHS Trust	146	136	107 ●	29 ▲	100 ●	78	77 ■	29	59	12	0	0
Cambridge University Hospitals NHS Foundation Trust	233	244	95 ●	81 ●	12 ▲	175	98 ●	9	61	27	3	0
Colchester Hospital University NHS Foundation Trust	256	246	104 ●	38 ▲	32 ▲	125	19 ▲	5	32	6	0	57
East and North Hertfordshire NHS Trust	190	238	80 ●	11 ▲	1 ▲	81	30 ▲	16	46	26	4	9
Hinchingbrooke Health Care NHS Trust	96	100	96 ●	79 ■	99 ●	64	88 ●	14	58	25	3	0
Ipswich Hospital NHS Trust	236	240	98 ●	79 ■	52 ■	167	64 ■	16	26	22	5	31
James Paget University Hospitals NHS Foundation Trust	139	135	103 ●	71 ■	91 ●	79	80 ●	5	34	54	5	1
Luton and Dunstable University Hospital NHS Foundation Trust	177	171	104 ●	79 ■	93 ●	93	41 ▲	12	49	17	1	20
Mid Essex Hospital Services NHS Trust	115	169	68 ■	50 ▲	97 ●	83	49 ▲	14	49	25	2	8
Norfolk and Norwich University Hospitals NHS Foundation Trust	450	413	109 ●	54 ■	90 ●	252	73 ■	8	68	21	2	0
Peterborough and Stamford Hospitals NHS Foundation Trust	161	174	93 ●	34 ▲	98 ●	124	44 ▲	11	49	33	4	2
Southend University Hospital NHS Foundation Trust	177	186	95 ●	15 ▲	49 ▲	126	99 ●	8	74	17	1	0
The Queen Elizabeth Hospital, King's Lynn, NHS Foundation Trust	126	132	95 ●	37 ▲	98 ●	66	12 ▲	2	23	68	6	2
West Hertfordshire Hospitals NHS Trust	247	204	121 ●	96 ●	6 ▲	155	98 ●	5	75	14	7	0
West Suffolk NHS Foundation Trust	159	147	108 ●	18 ▲	98 ●	90	99 ●	7	60	29	4	0
<b>Thames Valley</b>	<b>1,184</b>	<b>1,349</b>	<b>88</b> ●	<b>77</b> ■	<b>90</b> ●	<b>763</b>	<b>86</b> ●	<b>28</b>	<b>48</b>	<b>19</b>	<b>2</b>	<b>4</b>
Buckinghamshire Healthcare NHS Trust	248	227	109 ●	87 ●	96 ●	174	91 ●	52	33	11	1	3
Frimley Health NHS Foundation Trust – Heatherwood and Wexham Park Hospitals	199	169	118 ●	88 ●	98 ●	109	92 ●	34	53	8	4	1
Great Western Hospitals NHS Foundation Trust	174	211	82 ●	50 ■	43 ▲	117	75 ■	9	40	42	3	7
Milton Keynes Hospital NHS Foundation Trust	107	147	73 ■	50 ■	95 ●	68	44 ▲	10	50	19	4	16
Oxford University Hospitals NHS Trust	213	353	60 ■	80 ●	100 ●	147	92 ●	31	51	18	0	1
Royal Berkshire NHS Foundation Trust	232	242	96 ●	86 ●	99 ●	147	99 ●	14	63	21	2	0
<b>London Cancer Alliance</b>	<b>1,968</b>	<b>2,579</b>	<b>76</b> ■	<b>79</b> ■	<b>84</b> ●	<b>1,310</b>	<b>78</b> ■	<b>14</b>	<b>50</b>	<b>23</b>	<b>4</b>	<b>10</b>
Chelsea and Westminster Hospital NHS Foundation Trust	68	60	113 ●	90 ●	96 ●	35	83 ●	26	43	14	0	17
Croydon Health Services NHS Trust	121	110	110 ●	97 ●	99 ●	67	88 ●	6	58	27	1	7
Epsom and St Helier University Hospitals NHS Trust	155	173	90 ●	76 ■	99 ●	79	48 ▲	8	32	13	8	41
Guy's and St Thomas' NHS Foundation Trust	114	175	65 ■	29 ▲	18 ▲	112	23 ▲	11	33	21	2	34
Imperial College Healthcare NHS Trust	218	218	100 ●	100 ●	100 ●	142	98 ●	11	52	30	8	0
King's College Hospital NHS Foundation Trust – King's College Hospital	119	141	84 ●	81 ●	100 ●	86	90 ●	17	51	22	3	6
King's College Hospital NHS Foundation Trust – Princess Royal University Hospital	160	185	86 ●	91 ●	100 ●	95	85 ●	14	29	36	9	12
Kingston Hospital NHS Foundation Trust	155	178	87 ●	72 ■	89 ●	87	86 ●	26	44	26	2	1
Lewisham and Greenwich NHS Trust	243	255	95 ●	95 ●	99 ●	141	99 ●	12	65	21	2	0
London North West Hospitals NHS Trust	270	294	92 ●	76 ▲	26 ▲	194	75 ■	13	57	15	3	12
St George's Healthcare NHS Trust	126	152	83 ●	71 ■	99 ●	101	90 ●	28	56	14	2	0
The Hillingdon Hospitals NHS Foundation Trust	83	101	82 ●	35 ▲	99 ●	59	90 ●	14	42	34	5	5
The Royal Marsden NHS Foundation Trust	–	–	–	–	–	50	92 ●	0	78	20	0	2
West Middlesex University Hospital NHS Trust	102	91	112 ●	68 ■	100 ●	57	39 ▲	14	49	35	2	0
<b>London Cancer Network</b>	<b>1,222</b>	<b>1,326</b>	<b>92</b> ●	<b>82</b> ●	<b>92</b> ●	<b>759</b>	<b>77</b> ■	<b>19</b>	<b>46</b>	<b>23</b>	<b>2</b>	<b>11</b>
Barking, Havering and Redbridge University Hospitals NHS Trust	274	269	102 ●	69 ■	98 ●	168	50 ▲	17	36	14	1	31
Barts Health NHS Trust	262	294	89 ●	81 ●	68 ■	146	82 ●	21	51	17	1	11
Homerton University Hospital NHS Foundation Trust	90	78	115 ●	94 ●	99 ●	55	100 ●	0	38	49	13	0
North Middlesex University Hospital NHS Trust	64	102	63 ■	81 ●	100 ●	45	84 ●	56	36	9	0	0
Royal Free London NHS Foundation Trust – Barnet and Chase Farm Hospital	146	135	108 ●	92 ●	100 ●	84	98 ●	21	49	30	0	0
Royal Free London NHS Foundation Trust – Royal Free Hospital	80	95	84 ●	55 ■	100 ●	64	97 ●	17	55	25	3	0
The Princess Alexandra Hospital NHS Trust	120	152	79 ■	88 ●	92 ●	67	24 ▲	12	36	33	1	18
The Whittington Hospital NHS Trust	62	57	109 ●	92 ●	100 ●	49	96 ●	18	51	29	2	0
University College London Hospitals NHS Foundation Trust	113	144	78 ■	94 ●	99 ●	81	99 ●	15	68	17	0	0

**Table 7.1 (continued)**  
Case ascertainment and data completeness according to trust/hospital site

Network/Trust Name	No. cases reported to the Audit (total excludes Wales)	No. cases identified in HES	Case ascertainment %	Patients with complete pre-treatment staging (%)*	Patients with recorded performance status (%)+	No. cases having major surgery according to the Audit	Data completeness for patients having major surgery %	Patients having major surgery recorded as ASA 1 (%)	Patients having major surgery recorded as ASA 2 (%)	Patients having major surgery recorded as ASA 3 (%)	Patients having major surgery recorded as ASA 4/5 (%)	Patients having major surgery with no ASA recorded (%)
<b>South West</b>	<b>2,718</b>	<b>2,792</b>	<b>97</b> ●	<b>76</b> ●	<b>79</b> ■	<b>1,703</b>	<b>86</b> ●	<b>13</b>	<b>55</b>	<b>28</b>	<b>2</b>	1
Gloucestershire Hospitals NHS Foundation Trust	403	447	90 ●	53 ■	86 ●	271	58 ■	10	49	38	2	0
North Bristol NHS Trust	233	235	99 ●	33 ▲	100 ●	149	100 ●	9	67	21	3	0
Northern Devon Healthcare NHS Trust	112	145	77 ■	70 ■	100 ●	72	85 ●	18	51	29	1	0
Plymouth Hospitals NHS Trust	254	253	100 ●	70 ■	22 ▲	169	89 ●	9	54	30	2	5
Royal Cornwall Hospitals NHS Trust	311	294	106 ●	100 ●	62 ■	200	93 ●	21	50	24	5	1
Royal Devon and Exeter NHS Foundation Trust	288	282	102 ●	89 ●	100 ●	189	99 ●	13	58	28	2	0
Royal United Hospitals Bath NHS Foundation Trust	222	249	89 ●	96 ●	96 ●	159	99 ●	10	55	32	3	0
Salisbury NHS Foundation Trust	122	131	93 ●	68 ■	93 ●	56	77 ■	21	45	25	5	4
Taunton and Somerset NHS Foundation Trust	185	175	106 ●	71 ■	99 ●	97	87 ●	19	59	21	1	1
Torbay and South Devon NHS Foundation Trust	221	226	98 ●	96 ●	17 ▲	156	87 ●	10	60	29	1	1
University Hospitals Bristol NHS Foundation Trust	166	147	113 ●	95 ●	99 ●	95	86 ●	8	61	28	1	1
Weston Area Health NHS Trust	102	101	101 ●	67 ■	100 ●	53	74 ■	15	51	28	2	4
Yeovil District Hospital NHS Foundation Trust	98	107	92 ●	78 ■	100 ●	34	74 ■	15	65	15	3	3
<b>Wessex</b>	<b>1,551</b>	<b>1,495</b>	<b>104</b> ●	<b>73</b> ■	<b>72</b> ■	<b>905</b>	<b>85</b> ●	<b>10</b>	<b>56</b>	<b>22</b>	<b>3</b>	<b>9</b>
Dorset County Hospital NHS Foundation Trust	153	153	100 ●	74 ■	100 ●	104	81 ●	13	56	28	3	0
Hampshire Hospitals NHS Foundation Trust – Basingstoke and North Hampshire Hospital	132	184	72 ■	42 ▲	91 ●	57	5 ▲	2	9	0	0	89
Hampshire Hospitals NHS Foundation Trust – Royal Hampshire County Hospital	132	125	106 ●	86 ●	100 ●	83	92 ●	6	78	12	4	0
Isle of Wight NHS Trust	112	87	129 ●	73 ■	96 ●	72	75 ■	8	46	28	1	17
Poole Hospital NHS Foundation Trust	168	147	114 ●	79 ■	93 ●	102	98 ●	14	67	17	3	0
Portsmouth Hospitals NHS Trust	348	318	109 ●	64 ■	45 ▲	221	92 ●	7	57	24	4	8
The Royal Bournemouth and Christchurch Hospitals NHS Foundation Trust	249	205	121 ●	71 ■	15 ▲	101	90 ●	8	66	26	0	0
University Hospital Southampton NHS Foundation Trust	254	276	92 ●	92 ●	100 ●	162	98 ●	18	53	25	2	2
<b>South East Coast</b>	<b>2,248</b>	<b>2,630</b>	<b>85</b> ●	<b>71</b> ■	<b>84</b> ●	<b>1,439</b>	<b>87</b> ●	<b>15</b>	<b>57</b>	<b>22</b>	<b>2</b>	<b>4</b>
Ashford and St Peter's Hospitals NHS Foundation Trust	168	167	101 ●	32 ▲	100 ●	111	96 ●	14	59	28	0	0
Brighton and Sussex University Hospitals NHS Trust	193	216	89 ●	54 ■	98 ●	55	62 ■	7	62	25	2	4
Dartford and Gravesham NHS Trust	128	160	80 ●	63 ■	99 ●	100	99 ●	12	52	29	7	0
East Kent Hospitals University NHS Foundation Trust	413	445	93 ●	69 ■	79 ■	241	81 ■	22	59	17	2	0
East Sussex Healthcare NHS Trust	192	278	69 ■	44 ▲	87 ●	137	73 ■	12	59	23	1	5
Frimley Health NHS Foundation Trust – Frimley Park Hospital	99	188	53 ■	77 ■	98 ●	107	88 ●	10	68	19	2	1
Maidstone and Tunbridge Wells NHS Trust	262	272	96 ●	83 ●	63 ■	151	93 ●	16	55	19	3	7
Medway NHS Foundation Trust	171	184	93 ●	84 ●	93 ●	109	82 ●	19	59	20	2	0
Royal Surrey County Hospital NHS Foundation Trust	155	187	83 ●	96 ●	23 ▲	78	69 ■	14	44	14	0	28
Surrey and Sussex Healthcare NHS Trust	129	186	69 ■	99 ●	99 ●	130	100 ●	13	64	23	0	0
Western Sussex Hospitals NHS Foundation Trust – St Richard's Hospital	194	202	96 ●	80 ●	99 ●	136	99 ●	20	48	25	7	1
Western Sussex Hospitals NHS Foundation Trust – Worthing Hospital	143	145	99 ●	78 ■	92 ●	82	79 ■	6	45	27	1	21

\* For the purposes of the Audit, the following recorded tumour stages are considered to be missing data: Tx, T9, Nx, N9, Mx, M9

The Royal Marsden and The Christie Hospital NHS Foundation trust are tertiary cancer centres that mainly provide oncological treatment for bowel cancer patients therefore have been excluded from Treatment Pathways.

**Table 7.2**  
Management of all patients reported to the audit according to trust/hospital site

Network/Trust Name	Number of patients reported to the audit	Seen by clinical nurse specialist (%)	Curative Major Resection Treatment Pathway (%)	Too Little Treatment Pathway (%)	Non-Curative Major Resection Treatment Pathway (%)	Too Much/ Too Frail Treatment Pathways (%)	Not Known/ Other Treatment Pathway* (%)
<b>Overall</b>	<b>30,122</b>	<b>92</b>	<b>59</b>	<b>4</b>	<b>4</b>	<b>16</b>	<b>17</b>
<b>Northern England</b>	<b>1,895</b>	<b>92</b>	<b>58</b>	<b>3</b>	<b>5</b>	<b>17</b>	<b>18</b>
City Hospitals Sunderland NHS Foundation Trust	184	85	63	1	4	18	15
County Durham and Darlington NHS Foundation Trust	281	94	64	1	4	20	11
Gateshead Health NHS Foundation Trust	156	87	19	6	2	4	70
North Cumbria University Hospitals NHS Trust	206	92	60	3	5	12	21
North Tees and Hartlepool NHS Foundation Trust	219	84	64	5	2	22	7
Northumbria Healthcare NHS Foundation Trust	277	96	60	3	7	21	9
South Tees Hospitals NHS Foundation Trust	279	95	61	3	5	10	21
South Tyneside NHS Foundation Trust	85	99	48	4	7	21	20
The Newcastle upon Tyne Hospitals NHS Foundation Trust	206	98	63	4	6	22	4
<b>Greater Manchester, Lancashire and South Cumbria</b>	<b>2,626</b>	<b>94</b>	<b>57</b>	<b>6</b>	<b>3</b>	<b>19</b>	<b>15</b>
Blackpool Teaching Hospitals NHS Foundation Trust	269	98	56	8	2	14	21
Bolton NHS Foundation Trust	175	97	71	3	3	13	9
Central Manchester University Hospitals NHS Foundation Trust	168	100	57	9	4	24	7
East Cheshire NHS Trust	113	82	57	6	4	27	5
East Lancashire Hospitals NHS Trust	209	94	58	3	2	16	20
Lancashire Teaching Hospitals NHS Foundation Trust	219	80	47	6	4	32	11
Mid Cheshire Hospitals NHS Foundation Trust	147	98	72	3	1	11	13
Pennine Acute Hospitals NHS Trust	354	100	60	5	2	23	11
Salford Royal NHS Foundation Trust	106	99	58	0	3	14	25
Stockport NHS Foundation Trust	189	98	47	2	6	30	15
Tameside Hospital NHS Foundation Trust	112	94	54	4	9	16	16
University Hospital of South Manchester NHS Foundation Trust	136	96	57	7	3	13	20
University Hospitals of Morecambe Bay NHS Foundation Trust	248	94	60	6	5	12	17
Wrightington, Wigan and Leigh NHS Foundation Trust	161	83	52	9	0	18	21
<b>Yorkshire and the Humber</b>	<b>3,008</b>	<b>82</b>	<b>60</b>	<b>4</b>	<b>3</b>	<b>17</b>	<b>16</b>
Airedale NHS Foundation Trust	132	78	55	1	2	20	21
Barnsley Hospital NHS Foundation Trust	125	100	58	8	2	25	7
Bradford Teaching Hospitals NHS Foundation Trust	155	5	70	3	2	6	19
Calderdale and Huddersfield NHS Foundation Trust	235	66	57	7	2	8	26
Chesterfield Royal Hospital NHS Foundation Trust	192	94	61	4	1	21	12
Doncaster and Bassetlaw Hospitals NHS Foundation Trust	196	97	64	3	2	11	20
Harrogate and District NHS Foundation Trust	149	97	65	5	1	20	9
Hull and East Yorkshire Hospitals NHS Trust	327	99	62	4	3	12	19
Leeds Teaching Hospitals NHS Trust	291	70	63	4	4	23	5
Mid Yorkshire Hospitals NHS Trust	274	90	52	6	2	22	18
Northern Lincolnshire and Goole NHS Foundation Trust	192	84	66	2	3	13	16
Sheffield Teaching Hospitals NHS Foundation Trust	272	86	60	5	1	25	9
The Rotherham NHS Foundation Trust	125	97	58	7	2	22	10
York Teaching Hospital NHS Foundation Trust – Scarborough Hospital	115	98	55	0	8	17	20
York Teaching Hospital NHS Foundation Trust – The York Hospital	223	94	53	3	7	17	21

Table 7.2 (continued)

## Management of all patients reported to the audit according to trust/hospital site

Network/Trust Name	Number of patients reported to the audit	Seen by clinical nurse specialist (%)	Curative Major Resection Treatment Pathway (%)	Too Little Treatment Pathway (%)	Non-Curative Major Resection Treatment Pathway (%)	Too Much/ Too Frail Treatment Pathways (%)	Not Known/ Other Treatment Pathway* (%)
<b>Cheshire and Merseyside</b>	<b>1,250</b>	<b>97</b>	<b>58</b>	<b>5</b>	<b>2</b>	<b>15</b>	<b>20</b>
Aintree University Hospital NHS Foundation Trust	237	92	53	8	2	12	24
Countess of Chester Hospital NHS Foundation Trust	148	97	70	3	3	9	16
Royal Liverpool and Broadgreen University Hospitals NHS Trust	183	97	58	5	3	17	16
Southport and Ormskirk Hospital NHS Trust	118	99	58	1	1	12	29
St Helens and Knowsley Hospitals NHS Trust	199	96	61	5	5	18	11
Warrington and Halton Hospitals NHS Foundation Trust	152	99	57	6	1	17	19
Wirral University Teaching Hospital NHS Foundation Trust	210	99	55	5	1	17	22
<b>Wales</b>	<b>2,108</b>	<b>100</b>	<b>56</b>	<b>4</b>	<b>6</b>	<b>13</b>	<b>21</b>
Bronglais MDT	51	100	37	2	18	20	24
Cardiff MDT	254	100	56	6	2	11	24
Nevill Hall Hospital MDT	123	100	50	3	11	23	14
Prince Charles Hospital MDT	109	100	81	0	0	9	10
Princess of Wales MDT	204	100	54	5	10	12	20
Royal Glamorgan Hospital MDT	124	100	56	0	1	15	28
Royal Gwent Hospital MDT	259	100	62	2	4	8	24
Swansea MDT	192	100	56	1	11	11	20
West Wales General & Prince Phillip MDT	156	100	50	4	4	21	21
Withybush General MDT	111	100	65	0	2	10	23
Ysbwyty Glan Clwydd MDT	157	100	52	7	9	10	22
Ysbwyty Gwynedd MDT	172	100	54	7	10	9	20
Ysbwyty Maelor MDT	196	100	54	8	5	15	18
<b>West Midlands</b>	<b>3,058</b>	<b>94</b>	<b>58</b>	<b>4</b>	<b>5</b>	<b>18</b>	<b>14</b>
George Eliot Hospital NHS Trust	90	92	63	2	3	14	17
Heart of England NHS Foundation Trust	400	88	55	5	9	28	5
Sandwell and West Birmingham Hospitals NHS Trust	202	91	50	3	6	22	18
Shrewsbury and Telford Hospital NHS Trust	388	98	61	4	4	18	13
South Warwickshire NHS Foundation Trust	126	91	56	8	6	23	8
The Dudley Group NHS Foundation Trust	199	98	52	7	4	22	16
The Royal Wolverhampton NHS Trust	264	99	61	4	6	20	9
University Hospitals Birmingham NHS Foundation Trust	122	99	57	0	6	10	27
University Hospitals Coventry and Warwickshire NHS Trust	226	100	58	0	2	19	20
University Hospitals of North Midlands NHS Trust – County Hospital	65	100	48	6	5	9	32
University Hospitals of North Midlands NHS Trust – Royal Stoke University Hospital	279	100	64	3	6	13	14
Walsall Healthcare NHS Trust	115	93	63	1	9	17	10
Worcestershire Acute Hospitals NHS Trust	421	91	59	6	4	14	16
Wye Valley NHS Trust	159	100	61	6	8	10	15
<b>East Midlands</b>	<b>2,135</b>	<b>92</b>	<b>55</b>	<b>5</b>	<b>5</b>	<b>21</b>	<b>14</b>
Burton Hospitals NHS Foundation Trust	149	99	70	2	1	24	3
Derby Hospitals NHS Foundation Trust	326	100	51	3	3	17	26
Kettering General Hospital NHS Foundation Trust	217	93	66	3	6	14	11
Northampton General Hospital NHS Trust	125	99	58	2	0	27	13
Nottingham University Hospitals NHS Trust	284	88	54	11	4	26	5
Sherwood Forest Hospitals NHS Foundation Trust	198	100	40	2	20	15	23
United Lincolnshire Hospitals NHS Trust	264	93	53	3	7	16	22
University Hospitals of Leicester NHS Trust	430	86	57	3	2	29	9

Table 7.2 (continued)

## Management of all patients reported to the audit according to trust/hospital site

Network/Trust Name	Number of patients reported to the audit	Seen by clinical nurse specialist (%)	Curative Major Resection Treatment Pathway (%)	Too Little Treatment Pathway (%)	Non-Curative Major Resection Treatment Pathway (%)	Too Much/ Too Frail Treatment Pathways (%)	Not Known/ Other Treatment Pathway* (%)
<b>East of England</b>	<b>3,150</b>	<b>87</b>	<b>57</b>	<b>4</b>	<b>5</b>	<b>15</b>	<b>19</b>
Basildon and Thurrock University Hospitals NHS Foundation Trust	221	84	62	5	2	23	9
Bedford Hospital NHS Trust	146	92	57	2	3	20	18
Cambridge University Hospitals NHS Foundation Trust	233	100	58	2	14	10	15
Colchester Hospital University NHS Foundation Trust	256	91	62	5	0	11	22
East and North Hertfordshire NHS Trust	190	88	41	0	3	3	53
Hinchingbrooke Health Care NHS Trust	96	82	64	7	6	18	5
Ipswich Hospital NHS Trust	236	83	60	2	6	13	19
James Paget University Hospitals NHS Foundation Trust	139	84	47	0	5	24	23
Luton and Dunstable University Hospital NHS Foundation Trust	177	98	53	5	3	20	19
Mid Essex Hospital Services NHS Trust	115	100	56	3	5	21	16
Norfolk and Norwich University Hospitals NHS Foundation Trust	450	73	52	6	5	12	24
Peterborough and Stamford Hospitals NHS Foundation Trust	161	91	75	1	2	11	11
Southend University Hospital NHS Foundation Trust	177	93	62	3	4	26	5
The Queen Elizabeth Hospital, King's Lynn, NHS Foundation Trust	126	87	54	4	2	13	26
West Hertfordshire Hospitals NHS Trust	247	95	62	3	4	14	17
West Suffolk NHS Foundation Trust	159	100	55	6	4	21	14
<b>Thames Valley</b>	<b>1,184</b>	<b>80</b>	<b>61</b>	<b>4</b>	<b>3</b>	<b>17</b>	<b>15</b>
Buckinghamshire Healthcare NHS Trust	248	97	63	3	5	19	9
Frimley Health NHS Foundation Trust – Heatherwood and Wexham Park Hospitals	199	7	53	3	5	25	15
Great Western Hospitals NHS Foundation Trust	174	100	53	0	6	9	32
Milton Keynes Hospital NHS Foundation Trust	107	100	61	2	4	1	33
Oxford University Hospitals NHS Trust	213	90	71	11	0	3	14
Royal Berkshire NHS Foundation Trust	232	100	63	4	1	31	1
<b>London Cancer Alliance</b>	<b>1,968</b>	<b>95</b>	<b>61</b>	<b>4</b>	<b>4</b>	<b>17</b>	<b>14</b>
Chelsea and Westminster Hospital NHS Foundation Trust	68	95	50	6	6	25	13
Croydon Health Services NHS Trust	121	96	56	5	2	31	6
Epsom and St Helier University Hospitals NHS Trust	155	100	46	0	6	24	24
Guy's and St Thomas' NHS Foundation Trust	114	100	67	5	4	10	15
Imperial College Healthcare NHS Trust	218	100	66	4	3	15	13
King's College Hospital NHS Foundation Trust – King's College Hospital	119	100	58	4	2	20	16
King's College Hospital NHS Foundation Trust – Princess Royal University Hospital	160	100	64	5	1	21	9
Kingston Hospital NHS Foundation Trust	155	85	57	6	5	13	20
Lewisham and Greenwich NHS Trust	243	100	57	3	5	28	7
London North West Hospitals NHS Trust	270	98	66	4	5	8	18
St George's Healthcare NHS Trust	126	98	75	3	4	8	10
The Hillingdon Hospitals NHS Foundation Trust	83	95	67	7	5	18	2
West Middlesex University Hospital NHS Trust	102	41	70	3	2	6	20
<b>London Cancer</b>	<b>1,222</b>	<b>98</b>	<b>59</b>	<b>4</b>	<b>4</b>	<b>15</b>	<b>19</b>
Barking, Havering and Redbridge University Hospitals NHS Trust	274	94	58	4	4	9	24
Barts Health NHS Trust	262	96	54	3	1	11	31
Homerton University Hospital NHS Foundation Trust	90	100	51	2	13	22	11
North Middlesex University Hospital NHS Trust	64	100	64	2	5	11	19
Royal Free London NHS Foundation Trust – Barnet and Chase Farm Hospital	146	99	54	3	2	31	10
Royal Free London NHS Foundation Trust – Royal Free Hospital	80	97	75	4	1	15	5
The Princess Alexandra Hospital NHS Trust	120	100	61	0	3	9	27
The Whittington Hospital NHS Trust	62	100	73	5	10	10	3
University College London Hospitals NHS Foundation Trust	113	100	63	9	0	19	9

Table 7.2 (continued)

## Management of all patients reported to the audit according to trust/hospital site

Network/Trust Name	Number of patients reported to the audit	Seen by clinical nurse specialist (%)	Curative Major Resection Treatment Pathway (%)	Too Little Treatment Pathway (%)	Non-Curative Major Resection Treatment Pathway (%)	Too Much/ Too Frail Treatment Pathways (%)	Not Known/ Other Treatment Pathway* (%)
<b>South West</b>	<b>2,718</b>	<b>97</b>	<b>61</b>	<b>4</b>	<b>3</b>	<b>18</b>	<b>14</b>
Gloucestershire Hospitals NHS Foundation Trust	403	100	64	5	3	15	13
North Bristol NHS Trust	233	99	48	3	9	26	14
Northern Devon Healthcare NHS Trust	112	97	66	2	3	16	13
Plymouth Hospitals NHS Trust	254	92	65	4	1	19	13
Royal Cornwall Hospitals NHS Trust	311	100	64	6	3	13	14
Royal Devon and Exeter NHS Foundation Trust	288	98	65	4	1	20	10
Royal United Hospitals Bath NHS Foundation Trust	222	94	68	4	5	17	7
Salisbury NHS Foundation Trust	122	97	52	2	2	29	16
Taunton and Somerset NHS Foundation Trust	185	97	54	4	1	24	17
Torbay and South Devon NHS Foundation Trust	221	100	65	4	6	15	11
University Hospitals Bristol NHS Foundation Trust	166	96	64	2	2	15	16
Weston Area Health NHS Trust	102	96	49	7	2	10	32
Yeovil District Hospital NHS Foundation Trust	98	93	50	8	5	26	11
<b>Wessex</b>	<b>1,551</b>	<b>88</b>	<b>57</b>	<b>4</b>	<b>3</b>	<b>17</b>	<b>19</b>
Dorset County Hospital NHS Foundation Trust	153	90	66	2	3	18	10
Hampshire Hospitals NHS Foundation Trust – Basingstoke and North Hampshire Hospital	132	95	55	2	4	14	26
Hampshire Hospitals NHS Foundation Trust – Royal Hampshire County Hospital	132	97	64	5	2	19	11
Isle of Wight NHS Trust	112	90	65	1	4	24	6
Poole Hospital NHS Foundation Trust	168	89	62	4	1	17	17
Portsmouth Hospitals NHS Trust	348	91	59	7	5	25	5
The Royal Bournemouth and Christchurch Hospitals NHS Foundation Trust	249	100	38	4	2	5	51
University Hospital Southampton NHS Foundation Trust	254	64	60	3	4	16	17
<b>South East Coast</b>	<b>2,248</b>	<b>84</b>	<b>61</b>	<b>4</b>	<b>3</b>	<b>9</b>	<b>22</b>
Ashford and St Peter's Hospitals NHS Foundation Trust	168	96	61	4	4	8	23
Brighton and Sussex University Hospitals NHS Trust	193	100	40	3	1	3	53
Dartford and Gravesham NHS Trust	128	83	58	4	5	5	28
East Kent Hospitals University NHS Foundation Trust	413	99	59	5	1	3	33
East Sussex Healthcare NHS Trust	192	100	64	5	2	17	13
Frimley Health NHS Foundation Trust – Frimley Park Hospital	99	100	83	4	11	0	2
Maidstone and Tunbridge Wells NHS Trust	262	94	56	2	2	13	27
Medway NHS Foundation Trust	171	96	58	2	5	20	15
Royal Surrey County Hospital NHS Foundation Trust	155	97	72	6	0	4	18
Surrey and Sussex Healthcare NHS Trust	129	88	88	4	5	0	2
Western Sussex Hospitals NHS Foundation Trust – St Richard's Hospital	194	25	64	7	6	19	4
Western Sussex Hospitals NHS Foundation Trust – Worthing Hospital	143	79	54	8	3	19	15

\* Some trusts have a number of patients undergoing major resection with missing curative intent and appear to have a lower proportion of major resection cases than would be expected as these patients are classified as Not Known/Other.

Table 7.3

## Management of patients who had major surgery according to trust/hospital site

Network/Trust Name	No. patients having major surgery	Patients with distant metastases at time of surgery (%)	Major surgery carried out as urgent or emergency (%)	Median number of lymph nodes excised	Laparoscopic surgery attempted (%)	Length of hospital stay >5 days (%)
<b>Overall</b>	<b>18,808</b>	<b>9</b>	<b>16</b>	<b>17</b>	<b>61</b>	<b>69</b>
<b>Northern England</b>	<b>1,267</b>	<b>9</b>	<b>18</b>	<b>17</b>	<b>75</b>	<b>64</b>
City Hospitals Sunderland NHS Foundation Trust	134	8	16	17	88	67
County Durham and Darlington NHS Foundation Trust	195	6	23	16	59	70
Gateshead Health NHS Foundation Trust	87	36	17	18	99	60
North Cumbria University Hospitals NHS Trust	138	11	20	14	62	69
North Tees and Hartlepool NHS Foundation Trust	121	8	12	20	88	49
Northumbria Healthcare NHS Foundation Trust	192	8	16	15	56	63
South Tees Hospitals NHS Foundation Trust	190	8	12	19	83	56
South Tyneside NHS Foundation Trust	50	10	36	16.5	92	71
The Newcastle upon Tyne Hospitals NHS Foundation Trust	160	6	20	21.5	77	71
<b>Greater Manchester, Lancashire and South Cumbria</b>	<b>1,599</b>	<b>10</b>	<b>16</b>	<b>15</b>	<b>53</b>	<b>78</b>
Blackpool Teaching Hospitals NHS Foundation Trust	110	9	14	13	77	74
Bolton NHS Foundation Trust	116	7	16	11	19	82
Central Manchester University Hospitals NHS Foundation Trust	80	19	21	15.5	30	86
East Cheshire NHS Trust	72	16	29	16	56	86
East Lancashire Hospitals NHS Trust	148	8	17	16	28	81
Lancashire Teaching Hospitals NHS Foundation Trust	135	5	11	10	60	78
Mid Cheshire Hospitals NHS Foundation Trust	93	5	11	14	65	78
Pennine Acute Hospitals NHS Trust	213	3	18	19.5	75	80
Salford Royal NHS Foundation Trust	77	7	10	14	51	69
Stockport NHS Foundation Trust	109	9	19	16	36	90
Tameside Hospital NHS Foundation Trust	71	18	14	18	63	71
The Christie NHS Foundation Trust	67	33	1	13	33	87
* University Hospital of South Manchester NHS Foundation Trust	94	11	14	21	53	85
* University Hospitals of Morecambe Bay NHS Foundation Trust	140	12	13	13.5	63	71
* Wrightington, Wigan and Leigh NHS Foundation Trust	74	1	26	14	61	49
<b>Yorkshire and the Humber</b>	<b>1,893</b>	<b>7</b>	<b>12</b>	<b>18</b>	<b>55</b>	<b>76</b>
Airedale NHS Foundation Trust	79	10	10	27	51	64
Barnsley Hospital NHS Foundation Trust	68	13	15	17	0	84
Bradford Teaching Hospitals NHS Foundation Trust	108	1	2	20	94	72
Calderdale and Huddersfield NHS Foundation Trust	109	5	3	18	43	76
Chesterfield Royal Hospital NHS Foundation Trust	122	8	7	16	28	83
Doncaster and Bassetlaw Hospitals NHS Foundation Trust	128	7	5	16	89	88
Harrogate and District NHS Foundation Trust	84	5	15	19	87	60
Hull and East Yorkshire Hospitals NHS Trust	190	9	19	17	38	86
Leeds Teaching Hospitals NHS Trust	212	11	15	18	76	77
Mid Yorkshire Hospitals NHS Trust	173	8	13	16	62	81
Northern Lincolnshire and Goole NHS Foundation Trust	150	6	15	17	49	89
Sheffield Teaching Hospitals NHS Foundation Trust	174	7	12	27	44	69
The Rotherham NHS Foundation Trust	74	12	8	14	80	66
York Teaching Hospital NHS Foundation Trust – Scarborough Hospital	60	3	8	19	45	62
York Teaching Hospital NHS Foundation Trust – The York Hospital	156	5	22	22	33	73

Table 7.3 (continued)

## Management of patients who had major surgery according to trust/hospital site

Network/Trust Name	No. patients having major surgery	Patients with distant metastases at time of surgery (%)	Major surgery carried out as urgent or emergency (%)	Median number of lymph nodes excised	Laparoscopic surgery attempted (%)	Length of hospital stay >5 days (%)
<b>Cheshire and Merseyside</b>	<b>719</b>	<b>8</b>	<b>15</b>	<b>17</b>	<b>58</b>	<b>68</b>
Aintree University Hospital NHS Foundation Trust	109	7	9	16	55	74
Countess of Chester Hospital NHS Foundation Trust	107	8	12	17	42	50
Royal Liverpool and Broadgreen University Hospitals NHS Trust	111	8	5	18	46	74
Southport and Ormskirk Hospital NHS Trust	71	16	18	14	75	76
St Helens and Knowsley Hospitals NHS Trust	138	14	24	19	67	73
Warrington and Halton Hospitals NHS Foundation Trust	87	6	23	17	66	63
Wirral University Teaching Hospital NHS Foundation Trust	96	0	11	17	63	65
<b>Wales</b>	<b>1,320</b>	<b>13</b>	<b>18</b>	<b>16</b>	<b>50</b>	<b>No PEDW</b>
Bronglais MDT	10	50	90	16.5	0	No PEDW
Cardiff MDT	152	13	16	16	74	No PEDW
Nevill Hall Hospital MDT	74	18	27	14	41	No PEDW
Prince Charles Hospital MDT	87	9	15	14	77	No PEDW
Princess of Wales MDT	119	28	1	17	23	No PEDW
Royal Glamorgan Hospital MDT	71	3	8	14	39	No PEDW
Royal Gwent Hospital MDT	170	14	19	15	47	No PEDW
Swansea MDT	152	12	28	17	36	No PEDW
West Wales General & Prince Phillip MDT	86	11	19	14	65	No PEDW
Withybush General MDT	74	5	18	15	54	No PEDW
Ysbwyty Glan Clwydd MDT	94	26	22	17	50	No PEDW
Ysbwyty Gwynedd MDT	116	20	23	14	46	No PEDW
Ysbwyty Maelor MDT	115	8	15	22	58	No PEDW
<b>West Midlands</b>	<b>1,920</b>	<b>11</b>	<b>18</b>	<b>20</b>	<b>61</b>	<b>67</b>
George Eliot Hospital NHS Trust	61	10	13	24	61	79
Heart of England NHS Foundation Trust	249	8	14	27	69	70
Sandwell and West Birmingham Hospitals NHS Trust	114	11	24	20	27	71
Shrewsbury and Telford Hospital NHS Trust	241	14	15	20	49	56
South Warwickshire NHS Foundation Trust	77	16	25	15	65	56
The Dudley Group NHS Foundation Trust	117	13	19	17	52	72
The Royal Wolverhampton NHS Trust	165	10	14	16	41	77
University Hospitals Birmingham NHS Foundation Trust	84	9	14	20	69	71
University Hospitals Coventry and Warwickshire NHS Trust	137	9	18	24	61	80
University Hospitals of North Midlands NHS Trust – County Hospital	32	43	6	17	78	67
University Hospitals of North Midlands NHS Trust – Royal Stoke University Hospital	193	19	14	15	84	60
Walsall Healthcare NHS Trust	83	19	52	18	47	79
Worcestershire Acute Hospitals NHS Trust	264	4	13	24	86	58
Wye Valley NHS Trust	102	14	23	16	41	76
<b>East Midlands</b>	<b>1,304</b>	<b>10</b>	<b>18</b>	<b>16</b>	<b>53</b>	<b>66</b>
Burton Hospitals NHS Foundation Trust	106	6	11	18	65	57
Derby Hospitals NHS Foundation Trust	177	8	16	18	38	69
Kettering General Hospital NHS Foundation Trust	131	8	23	17	51	58
Northampton General Hospital NHS Trust	96	7	21	15.5	61	67
Nottingham University Hospitals NHS Trust	244	10	20	15	70	66
Sherwood Forest Hospitals NHS Foundation Trust	115	12	11	21	58	71
United Lincolnshire Hospitals NHS Trust	179	15	20	17	47	69
University Hospitals of Leicester NHS Trust	256	10	20	13	42	67

Table 7.3 (continued)

## Management of patients who had major surgery according to trust/hospital site

Network/Trust Name	No. patients having major surgery	Patients with distant metastases at time of surgery (%)	Major surgery carried out as urgent or emergency (%)	Median number of lymph nodes excised	Laparoscopic surgery attempted (%)	Length of hospital stay >5 days (%)
<b>East of England</b>	<b>1,907</b>	<b>10</b>	<b>17</b>	<b>16</b>	<b>59</b>	<b>71</b>
Basildon and Thurrock University Hospitals NHS Foundation Trust	135	6	15	15	61	74
Bedford Hospital NHS Trust	78	11	18	15.5	50	82
Cambridge University Hospitals NHS Foundation Trust	175	9	9	17	57	72
Colchester Hospital University NHS Foundation Trust	125	2	14	16	84	64
East and North Hertfordshire NHS Trust	81	7	11	21	63	83
Hinchingbrooke Health Care NHS Trust	64	17	14	17	97	58
Ipswich Hospital NHS Trust	167	9	21	14	32	67
James Paget University Hospitals NHS Foundation Trust	79	9	19	14	84	77
Luton and Dunstable University Hospital NHS Foundation Trust	93	9	18	22	63	68
Mid Essex Hospital Services NHS Trust	83	11	17	16	82	70
Norfolk and Norwich University Hospitals NHS Foundation Trust	252	12	11	16	37	70
Peterborough and Stamford Hospitals NHS Foundation Trust	124	19	27	16	57	70
Southend University Hospital NHS Foundation Trust	126	7	15	21.5	80	75
The Queen Elizabeth Hospital, King's Lynn, NHS Foundation Trust	66	20	23	12	38	85
West Hertfordshire Hospitals NHS Trust	155	13	27	16	67	71
West Suffolk NHS Foundation Trust	90	7	21	17	49	60
<b>Thames Valley</b>	<b>763</b>	<b>9</b>	<b>13</b>	<b>19</b>	<b>73</b>	<b>61</b>
Buckinghamshire Healthcare NHS Trust	174	11	16	19	73	54
Frimley Health NHS Foundation Trust – Heatherwood and Wexham Park Hospitals	109	13	17	18	64	61
Great Western Hospitals NHS Foundation Trust	117	9	11	19	47	85
Milton Keynes Hospital NHS Foundation Trust	68	7	10	17	82	70
Oxford University Hospitals NHS Trust	147	6	10	21	88	58
Royal Berkshire NHS Foundation Trust	147	5	13	17	82	49
<b>London Cancer Alliance</b>	<b>1,310</b>	<b>11</b>	<b>14</b>	<b>18</b>	<b>56</b>	<b>72</b>
Chelsea and Westminster Hospital NHS Foundation Trust	35	18	23	22	43	90
Croydon Health Services NHS Trust	67	3	26	19	49	82
Epsom and St Helier University Hospitals NHS Trust	79	14	14	15	38	70
Guy's and St Thomas' NHS Foundation Trust	112	40	15	15	31	83
Imperial College Healthcare NHS Trust	142	11	3	24	80	69
King's College Hospital NHS Foundation Trust – King's College Hospital	86	11	12	18	77	71
King's College Hospital NHS Foundation Trust – Princess Royal University Hospital	95	10	12	14.5	51	50
Kingston Hospital NHS Foundation Trust	87	5	24	15	46	76
Lewisham and Greenwich NHS Trust	141	8	13	17	46	71
London North West Hospitals NHS Trust	194	10	12	26	73	69
St George's Healthcare NHS Trust	101	9	26	20	54	61
The Hillingdon Hospitals NHS Foundation Trust	59	14	2	13	64	93
The Royal Marsden NHS Foundation Trust	50	18	2	17	52	96
<b>West Middlesex University Hospital NHS Trust</b>	<b>57</b>	<b>17</b>	<b>21</b>	<b>15</b>	<b>49</b>	<b>70</b>
London Cancer	759	9	24	17	61	81
Barking, Havering and Redbridge University Hospitals NHS Trust	168	7	43	15	46	75
Barts Health NHS Trust	146	6	30	18	81	85
Homerton University Hospital NHS Foundation Trust	55	15	9	16	40	92
North Middlesex University Hospital NHS Trust	45	21	18	17	42	95
Royal Free London NHS Foundation Trust – Barnet and Chase Farm Hospital	84	6	14	14.5	71	79
Royal Free London NHS Foundation Trust – Royal Free Hospital	64	11	5	15.5	63	73
The Princess Alexandra Hospital NHS Trust	67	12	23	18	76	73
The Whittington Hospital NHS Trust	49	16	29	20	55	70
University College London Hospitals NHS Foundation Trust	81	5	6	18	62	92

Table 7.3 (continued)

## Management of patients who had major surgery according to trust/hospital site

Network/Trust Name	No. patients having major surgery	Patients with distant metastases at time of surgery (%)	Major surgery carried out as urgent or emergency (%)	Median number of lymph nodes excised	Laparoscopic surgery attempted (%)	Length of hospital stay >5 days (%)
<b>South West</b>	<b>1,703</b>	<b>7</b>	<b>15</b>	<b>17</b>	<b>72</b>	<b>59</b>
Gloucestershire Hospitals NHS Foundation Trust	271	5	9	23	61	68
North Bristol NHS Trust	149	8	6	20	97	43
Northern Devon Healthcare NHS Trust	72	5	8	16	78	36
Plymouth Hospitals NHS Trust	169	3	17	18	77	75
Royal Cornwall Hospitals NHS Trust	200	13	16	18	91	43
Royal Devon and Exeter NHS Foundation Trust	189	6	19	14	53	66
Royal United Hospitals Bath NHS Foundation Trust	159	2	29	20	79	67
Salisbury NHS Foundation Trust	56	7	13	17	84	52
Taunton and Somerset NHS Foundation Trust	97	6	13	16	73	42
Torbay and South Devon NHS Foundation Trust	156	8	18	14	57	65
University Hospitals Bristol NHS Foundation Trust	95	10	11	14	66	64
Weston Area Health NHS Trust	53	15	8	14	47	63
Yeovil District Hospital NHS Foundation Trust	34	8	18	20	62	80
<b>Wessex</b>	<b>905</b>	<b>7</b>	<b>14</b>	<b>19</b>	<b>72</b>	<b>60</b>
Dorset County Hospital NHS Foundation Trust	104	1	17	19	75	56
Hampshire Hospitals NHS Foundation Trust – Basingstoke and North Hampshire Hospital	57	25	11	23	68	87
Hampshire Hospitals NHS Foundation Trust – Royal Hampshire County Hospital	83	6	14	13.5	65	74
Isle of Wight NHS Trust	72	16	15	20.5	46	56
Poole Hospital NHS Foundation Trust	102	5	12	21.5	92	31
Portsmouth Hospitals NHS Trust	221	10	14	21	84	64
The Royal Bournemouth and Christchurch Hospitals NHS Foundation Trust	101	2	4	17	56	52
University Hospital Southampton NHS Foundation Trust	162	6	20	18	65	66
<b>South East Coast</b>	<b>1,439</b>	<b>9</b>	<b>15</b>	<b>18</b>	<b>62</b>	<b>65</b>
Ashford and St Peter's Hospitals NHS Foundation Trust	111	18	16	16	77	79
Brighton and Sussex University Hospitals NHS Trust	55	8	2	16.5	85	67
Dartford and Gravesham NHS Trust	100	8	19	18	55	81
East Kent Hospitals University NHS Foundation Trust	241	10	22	18	56	51
East Sussex Healthcare NHS Trust	137	4	10	20	31	76
Frimley Health NHS Foundation Trust – Frimley Park Hospital	107	19	15	21	82	51
Maidstone and Tunbridge Wells NHS Trust	151	3	16	17	54	80
Medway NHS Foundation Trust	109	12	11	20	72	62
Royal Surrey County Hospital NHS Foundation Trust	78	12	12	22	94	26
Surrey and Sussex Healthcare NHS Trust	130	6	19	17	42	74
Western Sussex Hospitals NHS Foundation Trust – St Richard's Hospital	136	5	10	20.5	66	62
Western Sussex Hospitals NHS Foundation Trust – Worthing Hospital	82	5	11	14.5	78	66

**Table 7.4**  
**Outcomes of patients who had major surgery according to trust/hospital site (excludes those recorded as greater than 18 years or ICD-10 code C18.1 (Malignant neoplasm of appendix))**

Network/Trust Name	No. patients having major surgery	Observed 90-day mortality (%)	Adjusted 90-day mortality (%)	No. patients having major surgery linked to HES	Observed 30-day unplanned readmission rate (%)	Adjusted 30-day unplanned readmission rate (%)	No. patients having major resection 1 Apr 12 - 31 Mar 13	Observed 2-year mortality (%)	Adjusted 2-year mortality (%)
<b>Overall</b>	<b>18,663</b>	<b>3.8</b>	<b>3.8</b>	<b>16,002</b>	<b>10.1</b>	<b>10.1</b>	<b>19,845</b>	<b>20.9</b>	<b>20.9</b>
<b>Northern England</b>	<b>1,259</b>	<b>4.7</b>	<b>4.1</b>	<b>1,190</b>	<b>10.3</b>	<b>10.3</b>	<b>1,250</b>	<b>19.5</b>	<b>21.2</b>
City Hospitals Sunderland NHS Foundation Trust	132	4.5	3.6	121	11.6	11.3	114	18.9	24.2
County Durham and Darlington NHS Foundation Trust	194	6.7	5.2	186	13.4	13.3	200	22.2	28.8
Gateshead Health NHS Foundation Trust	86	3.5	2.5	84	11.9	12.3	96	21.1	21.5
North Cumbria University Hospitals NHS Trust	137	5.1	5.4	130	10.8	10.9	98	18.2	20.9
North Tees and Hartlepool NHS Foundation Trust	120	1.7	1.7	112	6.3	6.0	152	16.6	17.9
Northumbria Healthcare NHS Foundation Trust	192	6.3	5.6	179	9.5	10.0	168	19.0	26.5
South Tees Hospitals NHS Foundation Trust	188	3.2	3.9	179	10.6	10.9	199	17.4	18.2
South Tyneside NHS Foundation Trust	50	6.0	3.9	48	6.3	5.8	68	35.5	34.1
The Newcastle upon Tyne Hospitals NHS Foundation Trust	160	4.4	3.5	151	9.3	9.1	155	15.8	12.1
<b>Greater Manchester, Lancashire and South Cumbria</b>	<b>1,585</b>	<b>4.7</b>	<b>4.7</b>	<b>1,473</b>	<b>10.4</b>	<b>10.3</b>	<b>1,795</b>	<b>22.7</b>	<b>22.5</b>
Blackpool Teaching Hospitals NHS Foundation Trust	108	2.8	4.0	101	11.9	12.2	117	26.6	29.8
Bolton NHS Foundation Trust	116	5.2	5.2	106	10.4	10.6	125	20.9	21.7
Central Manchester University Hospitals NHS Foundation Trust	80	3.8	6.4	71	15.5	14.7	118	23.3	22.5
East Cheshire NHS Trust	72	8.3	5.0	59	10.2	10.5	86	21.2	16.8
East Lancashire Hospitals NHS Trust	147	4.1	4.1	143	4.9	4.9	146	28.5	22.8
Lancashire Teaching Hospitals NHS Foundation Trust	135	6.7	7.2	127	12.6	12.3	120	15.4	20.8
Mid Cheshire Hospitals NHS Foundation Trust	93	1.1	1.4	88	11.4	10.9	88	9.7	16.4
Pennine Acute Hospitals NHS Trust	212	7.1	7.8	209	9.6	9.9	244	28.6	24.9
Salford Royal NHS Foundation Trust	77	5.2	5.5	68	4.4	4.3	91	27.0	24.0
Stockport NHS Foundation Trust	107	1.9	1.5	102	14.7	15.2	121	15.1	13.8
Tameside Hospital NHS Foundation Trust	71	2.8	2.2	69	7.2	7.3	90	27.4	42.9
The Christie NHS Foundation Trust	60	0.0	0.0	48	12.5	10.2	60	36.5	33.6
University Hospital of South Manchester NHS Foundation Trust	94	3.2	2.9	82	12.2	11.5	92	24.3	19.0
University Hospitals of Morecambe Bay NHS Foundation Trust	139	5.8	5.0	132	9.8	10.2	173	20.9	21.9
Wrightington, Wigan and Leigh NHS Foundation Trust	74	8.1	6.4	68	11.8	12.3	124	16.9	18.4
<b>Yorkshire and the Humber</b>	<b>1,877</b>	<b>3.7</b>	<b>4.4</b>	<b>1,752</b>	<b>10.2</b>	<b>10.2</b>	<b>2,015</b>	<b>20.7</b>	<b>22.0</b>
Airedale NHS Foundation Trust	79	2.5	5.2	76	6.6	7.2	86	12.3	10.6
Barnsley Hospital NHS Foundation Trust	68	5.9	7.4	63	15.9	16.0	88	42.0	36.6
Bradford Teaching Hospitals NHS Foundation Trust	107	0.9	1.6	104	10.6	10.2	114	23.9	23.3
Calderdale and Huddersfield NHS Foundation Trust	105	3.8	6.4	103	8.7	8.8	150	19.7	21.4
Chesterfield Royal Hospital NHS Foundation Trust	122	1.6	2.0	117	7.7	7.9	131	15.7	15.4
Doncaster and Bassetlaw Hospitals NHS Foundation Trust	128	4.7	6.1	120	14.2	13.4	163	13.1	18.3
Harrogate and District NHS Foundation Trust	84	2.4	3.3	80	10.0	10.2	75	24.4	23.5
Hull and East Yorkshire Hospitals NHS Trust	189	1.1	1.2	173	8.7	8.8	168	23.7	28.8
Leeds Teaching Hospitals NHS Trust	208	4.8	3.8	188	12.8	12.8	217	28.4	28.1
Mid Yorkshire Hospitals NHS Trust	172	2.9	5.4	162	6.2	6.5	181	17.8	18.9
Northern Lincolnshire and Goole NHS Foundation Trust	150	8.0	6.9	136	16.2	15.4	162	24.9	22.7
Sheffield Teaching Hospitals NHS Foundation Trust	169	4.1	4.8	155	7.7	7.5	218	14.3	17.6
The Rotherham NHS Foundation Trust	74	4.1	4.6	70	14.3	14.1	68	24.8	29.3
York Teaching Hospital NHS Foundation Trust – Scarborough Hospital	60	0.0	0.0	58	15.5	16.3	50	15.1	16.1
York Teaching Hospital NHS Foundation Trust – The York Hospital	156	6.4	6.6	147	4.8	4.8	144	19.2	22.2

Table 7.4 (continued)

Outcomes of patients who had major surgery according to trust/hospital site (excludes those recorded as greater than 18 years or ICD-10 code C18.1 (Malignant neoplasm of appendix))

Network/Trust Name	No. patients having major surgery	Observed 90-day mortality (%)	Adjusted 90-day mortality (%)	No. patients having major surgery linked to HES	Observed 30-day unplanned readmission rate (%)	Adjusted 30-day unplanned readmission rate (%)	No. patients having major resection 1 Apr 12 - 31 Mar 13	Observed 2-year mortality (%)	Adjusted 2-year mortality (%)
<b>Cheshire and Merseyside</b>	<b>716</b>	<b>2.8</b>	<b>2.9</b>	<b>653</b>	<b>10.1</b>	<b>10.3</b>	<b>872</b>	<b>19.5</b>	<b>20.0</b>
Aintree University Hospital NHS Foundation Trust	109	2.8	3.4	102	15.7	15.8	129	22.6	21.6
Countess of Chester Hospital NHS Foundation Trust	107	0.9	0.7	101	6.9	7.5	109	17.7	12.7
Royal Liverpool and Broadgreen University Hospitals NHS Trust	111	1.8	2.7	90	7.8	7.5	139	17.4	25.4
Southport and Ormskirk Hospital NHS Trust	70	0.0	0.0	62	11.3	11.7	90	21.4	23.7
St Helens and Knowsley Hospitals NHS Trust	137	7.3	5.6	129	6.2	6.2	155	23.5	19.0
Warrington and Halton Hospitals NHS Foundation Trust	87	3.4	5.2	84	13.1	13.3	123	19.1	28.6
Wirral University Teaching Hospital NHS Foundation Trust	95	1.1	1.1	85	11.8	12.1	127	14.5	16.6
<b>Wales</b>	<b>1,307</b>	<b>4.9</b>	<b>3.9</b>	<b>No PEDW</b>	<b>No PEDW</b>	<b>No PEDW</b>	<b>1,328</b>	<b>23.9</b>	<b>22.4</b>
Bronglais MDT	10	10.0	2.9	No PEDW	No PEDW	No PEDW	34	16.0	11.9
Cardiff MDT	151	2.6	2.6	No PEDW	No PEDW	No PEDW	156	19.7	19.8
Nevill Hall Hospital MDT	74	4.1	2.8	No PEDW	No PEDW	No PEDW	67	38.1	25.2
Prince Charles Hospital MDT	87	9.2	7.0	No PEDW	No PEDW	No PEDW	77	12.5	12.8
Princess of Wales MDT	118	7.6	5.7	No PEDW	No PEDW	No PEDW	127	27.3	24.7
Royal Glamorgan Hospital MDT	70	4.3	4.4	No PEDW	No PEDW	No PEDW	95	23.4	21.3
Royal Gwent Hospital MDT	170	2.9	2.1	No PEDW	No PEDW	No PEDW	153	20.3	16.9
Swansea MDT	150	6.7	5.9	No PEDW	No PEDW	No PEDW	193	26.7	26.5
West Wales General & Prince Phillip MDT	85	8.2	6.5	No PEDW	No PEDW	No PEDW	90	30.3	31.0
Withybush General MDT	73	1.4	1.5	No PEDW	No PEDW	No PEDW	60	18.6	20.4
Ysbwyty Glan Clwydd MDT	93	2.2	1.5	No PEDW	No PEDW	No PEDW	98	26.8	19.1
Ysbwyty Gwynedd MDT	112	4.5	3.5	No PEDW	No PEDW	No PEDW	91	28.7	34.6
Ysbwyty Maelor MDT	114	5.3	3.9	No PEDW	No PEDW	No PEDW	87	20.7	28.6
<b>West Midlands</b>	<b>1,869</b>	<b>4.3</b>	<b>4.1</b>	<b>1,713</b>	<b>10.3</b>	<b>10.3</b>	<b>2,138</b>	<b>22.8</b>	<b>21.2</b>
George Eliot Hospital NHS Trust	61	4.9	4.0	59	10.2	10.5	61	17.9	16.9
Heart of England NHS Foundation Trust	248	2.0	2.3	214	11.2	11.0	260	23.0	21.1
Sandwell and West Birmingham Hospitals NHS Trust	113	10.6	6.7	89	13.5	12.4	154	25.7	21.1
Shrewsbury and Telford Hospital NHS Trust	240	3.3	3.8	229	8.7	8.6	216	23.5	29.7
South Warwickshire NHS Foundation Trust	77	5.2	3.9	75	4.0	4.0	100	10.6	9.2
The Dudley Group NHS Foundation Trust	117	6.0	5.0	104	5.8	6.0	140	20.9	22.1
The Royal Wolverhampton NHS Trust	159	2.5	2.2	153	10.5	10.4	145	20.7	14.1
University Hospitals Birmingham NHS Foundation Trust	83	4.8	8.6	81	12.3	12.9	170	16.9	16.4
University Hospitals Coventry and Warwickshire NHS Trust	135	2.2	2.0	126	7.1	7.0	148	18.8	17.2
University Hospitals of North Midlands NHS Trust – County Hospital	32	6.3	†	30	3.3	†	81	27.2	21.8
University Hospitals of North Midlands NHS Trust – Royal Stoke University Hospital	191	3.1	3.4	181	15.5	16.3	211	24.3	23.8
Walsall Healthcare NHS Trust	83	8.4	5.3	76	5.3	5.4	85	34.2	26.2
Worcestershire Acute Hospitals NHS Trust	260	2.3	2.9	239	11.7	11.9	255	28.2	28.6
Wye Valley NHS Trust	101	10.9	10.3	87	11.5	11.3	112	24.5	24.9
<b>East Midlands</b>	<b>1,287</b>	<b>3.6</b>	<b>3.9</b>	<b>1,217</b>	<b>11.2</b>	<b>11.1</b>	<b>1,211</b>	<b>21.5</b>	<b>22.1</b>
Burton Hospitals NHS Foundation Trust	106	1.9	2.0	101	14.9	14.3	113	26.6	21.6
Derby Hospitals NHS Foundation Trust	176	2.8	3.6	169	7.7	7.9	147	13.8	18.6
Kettering General Hospital NHS Foundation Trust	128	1.6	2.0	122	6.6	6.7	120	27.2	22.9
Northampton General Hospital NHS Trust	95	1.1	1.4	90	10.0	10.0	119	28.0	31.6
Nottingham University Hospitals NHS Trust	242	4.1	4.0	230	11.7	11.5	240	17.3	20.1
Sherwood Forest Hospitals NHS Foundation Trust	112	2.7	2.9	104	14.4	14.5	126	18.5	22.3
United Lincolnshire Hospitals NHS Trust	177	6.8	7.0	167	15.0	14.9	83	32.1	29.4
University Hospitals of Leicester NHS Trust	251	4.4	4.4	234	10.3	10.1	263	20.6	19.3

**Table 7.4 (continued)**  
**Outcomes of patients who had major surgery according to trust/hospital site (excludes those recorded as greater than 18 years or ICD-10 code C18.1 (Malignant neoplasm of appendix))**

Network/Trust Name	No. patients having major surgery	Observed 90-day mortality (%)	Adjusted 90-day mortality (%)	No. patients having major surgery linked to HES	Observed 30-day unplanned readmission rate (%)	Adjusted 30-day unplanned readmission rate (%)	No. patients having major resection 1 Apr 12 - 31 Mar 13	Observed 2-year mortality (%)	Adjusted 2-year mortality (%)
<b>East of England</b>	<b>1,709</b>	<b>3.8</b>	<b>3.8</b>	<b>1,584</b>	<b>9.0</b>	<b>9.1</b>	<b>2,004</b>	<b>21.8</b>	<b>21.9</b>
Basildon and Thurrock University Hospitals NHS Foundation Trust	135	5.2	4.6	123	7.3	7.4	89	29.5	32.7
Bedford Hospital NHS Trust	78	0.0	0.0	78	3.8	3.8	89	19.4	23.1
Cambridge University Hospitals NHS Foundation Trust	174	0.0	0.0	158	7.0	7.0	195	22.6	19.3
Colchester Hospital University NHS Foundation Trust	124	0.8	†	118	5.9	†	160	20.1	25.2
East and North Hertfordshire NHS Trust	80	2.5	3.0	76	10.5	10.9	138	18.5	17.9
Hinchingbrooke Health Care NHS Trust	64	6.3	6.6	59	13.6	13.7	47	24.3	15.3
Ipswich Hospital NHS Trust	166	7.2	5.7	157	13.4	14.1	152	25.1	29.9
James Paget University Hospitals NHS Foundation Trust	79	5.1	3.6	78	5.1	5.1	100	32.9	25.6
Luton and Dunstable University Hospital NHS Foundation Trust	92	3.3	3.3	84	13.1	12.7	49	23.7	18.0
Mid Essex Hospital Services NHS Trust	83	1.2	1.6	76	1.3	1.3	99	16.4	20.4
Norfolk and Norwich University Hospitals NHS Foundation Trust	252	1.6	1.8	237	6.8	6.6	242	14.2	17.7
Peterborough and Stamford Hospitals NHS Foundation Trust	124	5.6	4.5	113	15.0	15.7	143	18.7	23.3
Southend University Hospital NHS Foundation Trust	126	4.0	5.3	112	9.8	10.6	134	25.0	22.1
The Queen Elizabeth Hospital, King's Lynn, NHS Foundation Trust	66	4.5	††	61	4.9	††	99	22.8	25.8
West Hertfordshire Hospitals NHS Trust	153	6.5	5.6	147	10.9	10.9	142	26.5	23.1
West Suffolk NHS Foundation Trust	89	5.6	4.6	85	7.1	7.3	123	24.9	18.0
<b>Thames Valley</b>	<b>755</b>	<b>2.5</b>	<b>3.1</b>	<b>655</b>	<b>10.2</b>	<b>10.1</b>	<b>779</b>	<b>19.8</b>	<b>19.3</b>
Buckinghamshire Healthcare NHS Trust	172	4.1	5.5	137	9.5	10.1	166	13.4	14.6
Frimley Health NHS Foundation Trust – Heatherwood and Wexham Park Hospitals	106	4.7	5.0	91	15.4	15.6	110	14.6	†
Great Western Hospitals NHS Foundation Trust	116	0.9	0.9	109	11.9	11.0	142	22.9	16.8
Milton Keynes Hospital NHS Foundation Trust	67	4.5	4.0	63	6.3	6.0	60	26.9	24.9
Oxford University Hospitals NHS Trust	146	0.0	0.0	124	9.7	9.5	243	22.8	26.0
Royal Berkshire NHS Foundation Trust	147	2.0	2.7	131	8.4	8.5	168	17.2	16.2
<b>London Cancer Alliance</b>	<b>1,298</b>	<b>3.2</b>	<b>3.0</b>	<b>1,190</b>	<b>10.0</b>	<b>10.0</b>	<b>1,135</b>	<b>21.3</b>	<b>19.8</b>
Chelsea and Westminster Hospital NHS Foundation Trust	35	0.0	0.0	31	9.7	10.1	46	19.8	15.8
Croydon Health Services NHS Trust	67	3.0	2.9	61	8.2	8.4	80	19.6	22.6
Epsom and St Helier University Hospitals NHS Trust	78	3.8	3.0	76	9.2	10.3	121	17.5	17.6
Guy's and St Thomas' NHS Foundation Trust	112	5.4	4.8	102	10.8	9.7	122	23.0	21.7
Imperial College Healthcare NHS Trust	137	5.1	4.3	123	6.5	6.6	119	23.0	16.5
King's College Hospital NHS Foundation Trust – King's College Hospital	86	1.2	1.3	79	5.1	5.2	68	25.3	21.6
King's College Hospital NHS Foundation Trust – Princess Royal University Hospital	95	3.2	2.0	87	16.1	16.4	42	15.3	14.9
Kingston Hospital NHS Foundation Trust	87	2.3	2.1	76	11.8	12.8	89	23.1	23.9
Lewisham and Greenwich NHS Trust	141	1.4	1.5	132	12.1	12.2	99	12.9	13.8
London North West Hospitals NHS Trust	188	5.9	6.2	172	11.0	10.8	116	22.2	30.7
St George's Healthcare NHS Trust	101	1.0	1.3	95	9.5	9.7	94	23.7	26.2
The Hillingdon Hospitals NHS Foundation Trust	59	1.7	1.4	55	3.6	3.6	58	28.4	17.8
The Royal Marsden NHS Foundation Trust	50	0.0	0.0	45	11.1	9.7	20	15.7	20.2
West Middlesex University Hospital NHS Trust	57	3.5	3.4	54	13.0	13.3	61	26.7	16.6
<b>London Cancer</b>	<b>754</b>	<b>3.1</b>	<b>3.1</b>	<b>680</b>	<b>9.1</b>	<b>9.1</b>	<b>843</b>	<b>22.8</b>	<b>21.3</b>
Barking, Havering and Redbridge University Hospitals NHS Trust	166	3.6	3.6	150	10.0	10.5	161	21.7	26.3
Barts Health NHS Trust	146	2.7	3.7	131	6.1	5.9	185	24.1	19.0
Homerton University Hospital NHS Foundation Trust	55	5.5	3.0	52	9.6	9.4	38	37.9	35.3
North Middlesex University Hospital NHS Trust	45	4.4	4.9	38	7.9	8.2	49	20.5	18.3
Royal Free London NHS Foundation Trust – Barnet and Chase Farm Hospital	83	1.2	1.3	78	7.7	7.6	136	16.9	15.1
Royal Free London NHS Foundation Trust – Royal Free Hospital	64	3.1	3.4	51	7.8	7.6	59	40.5	40.1
The Princess Alexandra Hospital NHS Trust	66	4.5	3.8	59	15.3	16.0	90	22.3	18.0
The Whittington Hospital NHS Trust	48	4.2	4.0	43	18.6	19.5	49	20.6	14.6
University College London Hospitals NHS Foundation Trust	81	0.0	0.0	78	5.1	4.9	76	17.1	28.7

Table 7.4 (continued)

Outcomes of patients who had major surgery according to trust/hospital site (excludes those recorded as greater than 18 years or ICD-10 code C18.1 (Malignant neoplasm of appendix))

Network/Trust Name	No. patients having major surgery	Observed 90-day mortality (%)	Adjusted 90-day mortality (%)	No. patients having major surgery linked to HES	Observed 30-day unplanned readmission rate (%)	Adjusted 30-day unplanned readmission rate (%)	No. patients having major resection 1 Apr 12 - 31 Mar 13	Observed 2-year mortality (%)	Adjusted 2-year mortality (%)
<b>South West Coast</b>	<b>1,685</b>	<b>3.3</b>	<b>3.4</b>	<b>1,560</b>	<b>10.6</b>	<b>10.7</b>	<b>1,885</b>	<b>19.7</b>	<b>18.9</b>
Gloucestershire Hospitals NHS Foundation Trust	269	2.2	2.2	245	13.1	12.7	273	20.5	19.9
North Bristol NHS Trust	149	2.0	2.7	138	13.8	13.5	173	17.7	10.5
Northern Devon Healthcare NHS Trust	71	1.4	1.7	68	7.4	7.4	77	20.2	13.3
Plymouth Hospitals NHS Trust	163	3.1	3.0	147	4.8	4.9	185	14.1	14.1
Royal Cornwall Hospitals NHS Trust	200	2.5	2.4	185	11.9	12.2	182	25.1	24.8
Royal Devon and Exeter NHS Foundation Trust	189	5.3	5.0	178	11.2	11.8	185	18.1	21.8
Royal United Hospitals Bath NHS Foundation Trust	157	6.4	5.7	152	6.6	6.7	153	15.3	20.7
Salisbury NHS Foundation Trust	56	3.6	2.8	54	22.2	21.6	101	14.0	15.7
Taunton and Somerset NHS Foundation Trust	97	3.1	4.0	85	8.2	8.4	151	21.3	21.9
Torbay and South Devon NHS Foundation Trust	152	4.6	5.5	146	8.9	9.3	136	20.0	21.6
University Hospitals Bristol NHS Foundation Trust	92	0.0	0.0	83	8.4	8.4	106	18.7	16.6
Weston Area Health NHS Trust	53	3.8	3.5	49	10.2	10.3	79	41.7	40.1
Yeovil District Hospital NHS Foundation Trust	34	2.9	3.2	30	20.0	20.1	84	21.4	23.1
<b>Wessex</b>	<b>843</b>	<b>2.8</b>	<b>3.0</b>	<b>757</b>	<b>10.4</b>	<b>10.5</b>	<b>1,006</b>	<b>15.6</b>	<b>16.3</b>
Dorset County Hospital NHS Foundation Trust	104	4.8	4.7	96	10.4	10.9	99	17.1	16.4
Hampshire Hospitals NHS Foundation Trust – Basingstoke and North Hampshire Hospital	57	3.5	†	54	9.3	†	93	11.4	17.2
Hampshire Hospitals NHS Foundation Trust – Royal Hampshire County Hospital	83	1.2	1.3	74	5.4	5.3	107	15.3	16.2
Isle of Wight NHS Trust	72	4.2	3.5	59	15.3	16.0	81	26.6	29.9
Poole Hospital NHS Foundation Trust	99	2.0	2.4	89	15.7	16.3	98	20.8	15.7
Portsmouth Hospitals NHS Trust	220	4.5	4.6	192	10.4	10.1	241	11.0	11.6
The Royal Bournemouth and Christchurch Hospitals NHS Foundation Trust	101	0.0	0.0	90	13.3	13.5	114	13.5	14.9
University Hospital Southampton NHS Foundation Trust	161	1.9	1.7	157	6.4	6.5	173	17.6	18.3
<b>South East Coast</b>	<b>1,428</b>	<b>3.9</b>	<b>4.0</b>	<b>1,314</b>	<b>9.1</b>	<b>9.4</b>	<b>1,474</b>	<b>19.0</b>	<b>21.4</b>
Ashford and St Peter's Hospitals NHS Foundation Trust	110	2.7	2.8	106	7.5	7.9	104	19.5	18.9
Brighton and Sussex University Hospitals NHS Trust	55	3.6	5.0	45	8.9	9.0	122	22.6	28.0
Dartford and Gravesham NHS Trust	99	6.1	4.9	94	12.8	12.7	58	26.5	36.2
East Kent Hospitals University NHS Foundation Trust	239	3.3	3.5	222	8.6	9.3	127	17.1	18.5
East Sussex Healthcare NHS Trust	136	0.7	1.0	124	4.8	5.1	154	23.0	27.9
Frimley Health NHS Foundation Trust – Frimley Park Hospital	106	1.9	2.3	93	10.8	10.7	168	17.2	17.1
Maidstone and Tunbridge Wells NHS Trust	149	4.0	4.6	132	9.1	9.6	192	10.5	11.4
Medway NHS Foundation Trust	109	4.6	5.2	101	6.9	7.0	111	22.1	23.9
Royal Surrey County Hospital NHS Foundation Trust	77	3.9	4.9	69	4.3	4.5	100	18.8	17.9
Surrey and Sussex Healthcare NHS Trust	129	4.7	5.2	118	12.7	12.8	105	19.2	26.1
Western Sussex Hospitals NHS Foundation Trust – St Richard's Hospital	135	5.9	4.3	130	12.3	13.0	131	22.9	28.1
Western Sussex Hospitals NHS Foundation Trust – Worthing Hospital	82	6.1	5.5	80	8.8	9.7	102	18.5	23.3

† Adjusted estimates not reported because most patients missing ASA grade (also not included in associated Network totals)

†† Adjusted estimates not reported because most patients missing pathological M stage (also not included in associated Network totals)

Network totals for mortality include cases at private hospitals

**Table 7.5**  
Results for patients with rectal cancer who had major surgery according to trust/hospital site

Network/Trust Name	Number of patients with rectal cancer undergoing major surgery	Positive margins reported (%)	Records missing status of margins (%)	APER rate (%)	Number of patients diagnosed with rectal cancer April-Dec 2014 undergoing major surgery	Short or long course Pre-operative radiotherapy (%)	Number of patients in HES 18-month stoma estimate	Observed 18-month stoma rate using HES (%)	Adjusted 18-month stoma rate using HES (%)
<b>Overall</b>	<b>4,769</b>	<b>7</b>	<b>25</b>	<b>26</b>	<b>3,608</b>	<b>37</b>	<b>13,179</b>	<b>50</b>	<b>50</b>
<b>Northern England</b>	<b>324</b>	<b>6</b>	<b>11</b>	<b>29</b>	<b>256</b>	<b>36</b>	<b>985</b>	<b>48</b>	<b>48</b>
City Hospitals Sunderland NHS Foundation Trust	45	2	20	27	35	31	104	55	55
County Durham and Darlington NHS Foundation Trust	50	6	30	42	40	58	156	51	53
Gateshead Health NHS Foundation Trust	13	0	15	8	▲	▲	71	52	52
North Cumbria University Hospitals NHS Trust	32	6	3	34	26	50	72	43	43
North Tees and Hartlepool NHS Foundation Trust	39	18	8	8	32	16	132	40	41
Northumbria Healthcare NHS Foundation Trust	34	3	6	38	25	24	167	43	44
South Tees Hospitals NHS Foundation Trust	54	6	6	41	44	41	118	53	51
South Tyneside NHS Foundation Trust	18	0	0	28	15	20	52	56	54
The Newcastle upon Tyne Hospitals NHS Foundation Trust	39	10	0	13	30	30	113	45	44
<b>Greater Manchester, Lancashire and South Cumbria</b>	<b>387</b>	<b>6</b>	<b>26</b>	<b>30</b>	<b>290</b>	<b>63</b>	<b>1,258</b>	<b>59</b>	<b>58</b>
Blackpool Teaching Hospitals NHS Foundation Trust	20	5	80	40	17	47	60	65	65
Bolton NHS Foundation Trust	27	7	11	37	17	76	104	54	52
Central Manchester University Hospitals NHS Foundation Trust	26	27	0	27	18	67	82	60	55
East Cheshire NHS Trust	15	0	33	20	▲	▲	65	48	48
East Lancashire Hospitals NHS Trust	38	3	29	21	34	59	134	62	60
Lancashire Teaching Hospitals NHS Foundation Trust	37	5	19	38	28	39	95	76	74
Mid Cheshire Hospitals NHS Foundation Trust	27	11	52	33	21	86	63	57	63
Pennine Acute Hospitals NHS Trust	47	4	0	38	37	73	169	59	58
Salford Royal NHS Foundation Trust	18	11	6	44	15	53	64	53	55
Stockport NHS Foundation Trust	22	5	5	18	15	67	85	58	58
Tameside Hospital NHS Foundation Trust	10	0	100	20	▲	▲	72	54	51
The Christie NHS Foundation Trust	30	3	3	33	20	90	60	75	76
University Hospital of South Manchester NHS Foundation Trust	28	4	0	21	22	59	51	59	57
University Hospitals of Morecambe Bay NHS Foundation Trust	32	0	94	28	22	41	110	53	52
Wrightington, Wigan and Leigh NHS Foundation Trust	10	0	0	10	▲	▲	44	55	55
<b>Yorkshire and the Humber</b>	<b>498</b>	<b>8</b>	<b>23</b>	<b>31</b>	<b>366</b>	<b>51</b>	<b>1,619</b>	<b>53</b>	<b>53</b>
Airedale NHS Foundation Trust	24	4	8	38	15	53	51	67	65
Barnsley Hospital NHS Foundation Trust	13	0	0	15	11	0	55	60	61
Bradford Teaching Hospitals NHS Foundation Trust	30	13	0	33	20	60	80	49	44
Calderdale and Huddersfield NHS Foundation Trust	30	10	13	43	22	59	117	50	53
Chesterfield Royal Hospital NHS Foundation Trust	27	15	11	33	19	53	99	47	50
Doncaster and Bassetlaw Hospitals NHS Foundation Trust	37	0	8	41	29	28	154	50	52
Harrogate and District NHS Foundation Trust	25	12	4	16	20	60	61	46	46
Hull and East Yorkshire Hospitals NHS Trust	56	0	89	20	41	49	147	41	41
Leeds Teaching Hospitals NHS Trust	56	11	9	29	41	73	223	64	62
Mid Yorkshire Hospitals NHS Trust	39	5	3	21	25	48	138	50	54
Northern Lincolnshire and Goole NHS Foundation Trust	51	6	80	20	40	43	127	62	59
Sheffield Teaching Hospitals NHS Foundation Trust	41	12	2	37	32	50	163	53	54
The Rotherham NHS Foundation Trust	20	15	0	60	12	58	41	56	59
York Teaching Hospital NHS Foundation Trust – Scarborough Hospital	10	20	0	90	▲	▲	30	67	63
York Teaching Hospital NHS Foundation Trust – The York Hospital	37	8	3	35	29	48	133	45	48

**Table 7.5 (continued)**  
**Results for patients with rectal cancer who had major surgery according to trust/hospital site**

Network/Trust Name	Number of patients with rectal cancer undergoing major surgery	Positive margins reported (%)	Records missing status of margins (%)	APER rate (%)	Number of patients diagnosed with rectal cancer April-Dec 2014 undergoing major surgery	Short or long course Pre-operative radiotherapy (%)	Number of patients in HES 18-month stoma estimate	Observed 18-month stoma rate using HES (%)	Adjusted 18-month stoma rate using HES (%)
<b>Cheshire and Merseyside</b>	<b>165</b>	<b>8</b>	<b>48</b>	<b>25</b>	<b>124</b>	<b>52</b>	<b>526</b>	<b>49</b>	<b>50</b>
Aintree University Hospital NHS Foundation Trust	18	22	50	22	14	50	45	42	44
Countess of Chester Hospital NHS Foundation Trust	29	14	28	34	23	48	78	51	54
Royal Liverpool and Broadgreen University Hospitals NHS Trust	33	0	100	24	24	58	86	49	52
Southport and Ormskirk Hospital NHS Trust	12	8	75	8	▲	▲	42	38	39
St Helens and Knowsley Hospitals NHS Trust	33	9	15	33	26	58	106	53	51
Warrington and Halton Hospitals NHS Foundation Trust	15	7	27	13	11	0	96	51	51
Wirral University Teaching Hospital NHS Foundation Trust	25	4	44	20	17	71	73	48	47
<b>Wales</b>	<b>322</b>	<b>8</b>	<b>7</b>	<b>33</b>	<b>236</b>	<b>35</b>	<b>No PEDW</b>	<b>No PEDW</b>	<b>No PEDW</b>
Bronglais MDT	▲	▲	▲	▲	▲	▲	No PEDW	No PEDW	No PEDW
Cardiff MDT	31	0	3	23	27	30	No PEDW	No PEDW	No PEDW
Nevill Hall Hospital MDT	18	11	0	39	13	54	No PEDW	No PEDW	No PEDW
Prince Charles Hospital MDT	31	13	0	13	22	18	No PEDW	No PEDW	No PEDW
Princess of Wales MDT	39	5	5	38	27	26	No PEDW	No PEDW	No PEDW
Royal Glamorgan Hospital MDT	11	0	9	36	▲	▲	No PEDW	No PEDW	No PEDW
Royal Gwent Hospital MDT	40	8	0	33	30	23	No PEDW	No PEDW	No PEDW
Swansea MDT	39	15	3	44	23	30	No PEDW	No PEDW	No PEDW
West Wales General & Prince Phillip MDT	21	5	0	71	17	35	No PEDW	No PEDW	No PEDW
Withybush General MDT	18	0	78	39	15	47	No PEDW	No PEDW	No PEDW
Ysbwyty Glan Clwydd MDT	14	0	0	21	11	36	No PEDW	No PEDW	No PEDW
Ysbwyty Gwynedd MDT	29	17	0	24	21	62	No PEDW	No PEDW	No PEDW
Ysbwyty Maelor MDT	30	7	3	23	21	48	No PEDW	No PEDW	No PEDW
<b>West Midlands</b>	<b>499</b>	<b>4</b>	<b>52</b>	<b>22</b>	<b>381</b>	<b>27</b>	<b>1,486</b>	<b>53</b>	<b>52</b>
George Eliot Hospital NHS Trust	14	7	0	21	12	8	42	43	44
Heart of England NHS Foundation Trust	70	1	0	19	52	42	171	43	44
Sandwell and West Birmingham Hospitals NHS Trust	38	11	74	24	31	29	100	40	38
Shrewsbury and Telford Hospital NHS Trust	74	1	89	24	52	21	173	52	52
South Warwickshire NHS Foundation Trust	18	6	0	6	16	6	78	38	37
The Dudley Group NHS Foundation Trust	26	4	81	27	18	44	84	61	59
The Royal Wolverhampton NHS Trust	40	8	35	25	31	23	103	54	51
University Hospitals Birmingham NHS Foundation Trust	16	6	88	19	14	50	112	63	65
University Hospitals Coventry and Warwickshire NHS Trust	37	5	3	24	27	19	107	56	55
University Hospitals of North Midlands NHS Trust – County Hospital	▲	▲	▲	▲	▲	▲	35	74	71
University Hospitals of North Midlands NHS Trust – Royal Stoke University Hospital	38	0	95	26	24	63	148	52	53
Walsall Healthcare NHS Trust	19	21	21	16	16	38	54	46	44
Worcestershire Acute Hospitals NHS Trust	67	0	97	19	55	16	182	62	62
Wye Valley NHS Trust	35	0	23	20	27	7	97	56	53
<b>East Midlands</b>	<b>380</b>	<b>7</b>	<b>5</b>	<b>27</b>	<b>276</b>	<b>43</b>	<b>870</b>	<b>56</b>	<b>56</b>
Burton Hospitals NHS Foundation Trust	35	6	0	37	27	22	75	53	52
Derby Hospitals NHS Foundation Trust	37	8	14	24	28	36	101	50	53
Kettering General Hospital NHS Foundation Trust	40	5	23	23	30	23	96	50	51
Northampton General Hospital NHS Trust	28	0	0	29	21	10	84	49	48
Nottingham University Hospitals NHS Trust	75	4	7	20	48	23	171	53	56
Sherwood Forest Hospitals NHS Foundation Trust	29	7	3	17	21	43	77	51	52
United Lincolnshire Hospitals NHS Trust	66	14	0	29	47	57	62	76	75
University Hospitals of Leicester NHS Trust	70	7	0	36	54	85	204	63	60

**Table 7.5 (continued)**  
**Results for patients with rectal cancer who had major surgery according to trust/hospital site**

Network/Trust Name	Number of patients with rectal cancer undergoing major surgery	Positive margins reported (%)	Records missing status of margins (%)	APER rate (%)	Number of patients diagnosed with rectal cancer April-Dec 2014 undergoing major surgery	Short or long course Pre-operative radiotherapy (%)	Number of patients in HES 18-month stoma estimate	Observed 18-month stoma rate using HES (%)	Adjusted 18-month stoma rate using HES (%)
<b>East of England</b>	<b>483</b>	<b>8</b>	<b>28</b>	<b>22</b>	<b>366</b>	<b>26</b>	<b>1,536</b>	<b>48</b>	<b>47</b>
Basildon and Thurrock University Hospitals NHS Foundation Trust	38	8	0	18	29	24	76	46	46
Bedford Hospital NHS Trust	21	62	0	19	17	12	66	44	44
Cambridge University Hospitals NHS Foundation Trust	47	9	2	21	34	53	179	45	44
Colchester Hospital University NHS Foundation Trust	37	3	86	24	32	9	115	39	40
East and North Hertfordshire NHS Trust	21	10	29	33	11	18	87	57	59
Hinchingbrooke Health Care NHS Trust	16	6	0	6	12	8	21	29	29
Ipswich Hospital NHS Trust	31	0	94	3	22	36	106	43	43
James Paget University Hospitals NHS Foundation Trust	21	10	19	10	18	17	65	54	50
Luton and Dunstable University Hospital NHS Foundation Trust	26	0	12	15	18	22	37	59	53
Mid Essex Hospital Services NHS Trust	18	17	72	22	15	7	75	32	33
Norfolk and Norwich University Hospitals NHS Foundation Trust	76	5	18	16	61	20	232	43	42
Peterborough and Stamford Hospitals NHS Foundation Trust	24	8	46	46	16	63	122	64	61
Southend University Hospital NHS Foundation Trust	23	4	4	30	16	44	102	56	55
The Queen Elizabeth Hospital, King's Lynn, NHS Foundation Trust	19	0	84	26	13	31	74	66	62
West Hertfordshire Hospitals NHS Trust	37	3	3	32	31	16	114	46	45
West Suffolk NHS Foundation Trust	20	5	10	30	15	47	65	35	34
<b>Thames Valley</b>	<b>201</b>	<b>8</b>	<b>22</b>	<b>29</b>	<b>148</b>	<b>30</b>	<b>630</b>	<b>43</b>	<b>44</b>
Buckinghamshire Healthcare NHS Trust	38	11	0	24	28	29	102	42	43
Frimley Health NHS Foundation Trust – Heatherwood and Wexham Park Hospitals	25	20	44	24	16	38	69	57	56
Great Western Hospitals NHS Foundation Trust	37	5	51	41	28	7	72	40	40
Milton Keynes Hospital NHS Foundation Trust	22	14	36	23	16	31	57	56	54
Oxford University Hospitals NHS Trust	43	5	14	19	35	29	219	33	34
Royal Berkshire NHS Foundation Trust	36	3	0	44	25	52	111	52	56
<b>London Cancer Alliance</b>	<b>314</b>	<b>11</b>	<b>10</b>	<b>23</b>	<b>244</b>	<b>39</b>	<b>727</b>	<b>45</b>	<b>45</b>
Chelsea and Westminster Hospital NHS Foundation Trust	▲	▲	▲	▲	▲	▲	17	41	40
Croydon Health Services NHS Trust	16	0	0	13	13	15	43	40	40
Epsom and St Helier University Hospitals NHS Trust	▲	▲	▲	▲	▲	▲	56	38	38
Guy's and St Thomas' NHS Foundation Trust	45	20	2	31	33	55	85	61	61
Imperial College Healthcare NHS Trust	28	14	14	7	23	26	75	45	44
King's College Hospital NHS Foundation Trust – King's College Hospital	11	27	0	27	10	70	35	51	49
King's College Hospital NHS Foundation Trust – Princess Royal University Hospital	24	21	0	33	24	54	26	46	48
Kingston Hospital NHS Foundation Trust	15	0	20	27	12	33	42	38	40
Lewisham and Greenwich NHS Trust	37	3	3	27	26	50	62	42	42
London North West Hospitals NHS Trust	44	2	7	20	30	10	88	42	43
St George's Healthcare NHS Trust	26	15	4	15	18	39	74	32	32
The Hillingdon Hospitals NHS Foundation Trust	15	7	7	20	13	8	41	54	53
The Royal Marsden NHS Foundation Trust	22	14	9	27	17	82	38	58	65
West Middlesex University Hospital NHS Trust	17	6	82	35	16	19	45	38	34
<b>London Cancer</b>	<b>170</b>	<b>7</b>	<b>23</b>	<b>17</b>	<b>135</b>	<b>40</b>	<b>458</b>	<b>50</b>	<b>49</b>
Barking, Havering and Redbridge University Hospitals NHS Trust	35	6	80	26	28	79	84	50	49
Barts Health NHS Trust	35	17	3	11	26	27	104	49	45
Homerton University Hospital NHS Foundation Trust	15	0	0	27	15	20	19	53	50
North Middlesex University Hospital NHS Trust	▲	▲	▲	▲	▲	▲	20	60	60
Royal Free London NHS Foundation Trust – Barnet and Chase Farm Hospital	24	0	0	8	20	25	82	56	55
Royal Free London NHS Foundation Trust – Royal Free Hospital	14	7	0	29	12	67	29	48	53
The Princess Alexandra Hospital NHS Trust	13	0	77	8	▲	▲	52	38	39
The Whittington Hospital NHS Trust	10	20	0	10	▲	▲	17	53	48
University College London Hospitals NHS Foundation Trust	15	0	0	13	10	30	51	45	46

**Table 7.5 (continued)**  
**Results for patients with rectal cancer who had major surgery according to trust/hospital site**

Network/Trust Name	Number of patients with rectal cancer undergoing major surgery	Positive margins reported (%)	Records missing status of margins (%)	APER rate (%)	Number of patients diagnosed with rectal cancer April-Dec 2014 undergoing major surgery	Short or long course Pre-operative radiotherapy (%)	Number of patients in HES 18-month stoma estimate	Observed 18-month stoma rate using HES (%)	Adjusted 18-month stoma rate using HES (%)
<b>South West Coast</b>	<b>454</b>	<b>7</b>	<b>29</b>	<b>24</b>	<b>342</b>	<b>29</b>	<b>1,317</b>	<b>48</b>	<b>48</b>
Gloucestershire Hospitals NHS Foundation Trust	86	7	1	15	60	27	193	39	39
North Bristol NHS Trust	44	7	0	14	28	32	118	46	43
Northern Devon Healthcare NHS Trust	23	0	100	35	18	33	64	36	37
Plymouth Hospitals NHS Trust	39	10	8	31	30	67	127	57	59
Royal Cornwall Hospitals NHS Trust	53	0	100	30	41	24	145	56	55
Royal Devon and Exeter NHS Foundation Trust	41	15	0	29	35	23	134	50	51
Royal United Hospitals Bath NHS Foundation Trust	38	8	0	24	33	33	135	49	49
Salisbury NHS Foundation Trust	24	8	33	21	20	10	73	36	37
Taunton and Somerset NHS Foundation Trust	26	0	100	38	23	9	74	73	71
Torbay and South Devon NHS Foundation Trust	26	12	19	27	20	15	87	43	43
University Hospitals Bristol NHS Foundation Trust	24	0	8	17	17	24	67	39	40
Weston Area Health NHS Trust	15	20	47	40	10	70	54	63	58
Yeovil District Hospital NHS Foundation Trust	14	0	29	21	▲	▲	46	35	34
<b>Wessex</b>	<b>256</b>	<b>5</b>	<b>37</b>	<b>20</b>	<b>196</b>	<b>28</b>	<b>798</b>	<b>37</b>	<b>38</b>
Dorset County Hospital NHS Foundation Trust	26	0	100	35	21	19	62	31	31
Hampshire Hospitals NHS Foundation Trust – Basingstoke and North Hampshire Hospital	20	0	100	5	13	15	93	26	26
Hampshire Hospitals NHS Foundation Trust – Royal Hampshire County Hospital	20	20	10	15	16	13	62	35	36
Isle of Wight NHS Trust	16	0	6	25	13	38	57	40	42
Poole Hospital NHS Foundation Trust	25	8	8	24	18	28	64	30	30
Portsmouth Hospitals NHS Trust	72	10	0	18	56	29	243	35	36
The Royal Bournemouth and Christchurch Hospitals NHS Foundation Trust	28	0	4	21	18	22	93	44	44
University Hospital Southampton NHS Foundation Trust	47	0	89	21	40	43	124	53	51
<b>South East Coast</b>	<b>316</b>	<b>5</b>	<b>32</b>	<b>24</b>	<b>248</b>	<b>29</b>	<b>969</b>	<b>49</b>	<b>50</b>
Ashford and St Peter's Hospitals NHS Foundation Trust	19	5	89	26	15	27	47	43	43
Brighton and Sussex University Hospitals NHS Trust	15	0	100	40	13	54	88	66	67
Dartford and Gravesham NHS Trust	28	7	0	18	24	42	40	40	41
East Kent Hospitals University NHS Foundation Trust	36	0	6	39	30	17	85	76	76
East Sussex Healthcare NHS Trust	27	7	37	33	22	55	109	46	48
Frimley Health NHS Foundation Trust – Frimley Park Hospital	31	0	52	13	25	20	122	34	33
Maidstone and Tunbridge Wells NHS Trust	27	7	4	30	18	39	137	42	42
Medway NHS Foundation Trust	29	7	0	21	19	26	70	56	57
Royal Surrey County Hospital NHS Foundation Trust	25	0	92	16	19	26	63	48	52
Surrey and Sussex Healthcare NHS Trust	24	4	8	0	20	20	57	40	41
Western Sussex Hospitals NHS Foundation Trust – St Richard's Hospital	40	8	30	30	29	10	84	45	45
Western Sussex Hospitals NHS Foundation Trust – Worthing Hospital	14	7	21	29	13	46	67	58	58

▲ <10 cases

# Appendix 1 – Outlier Communications

Two-year Mortality			
NHS Trusts	Comment	Outlier 2014 Annual Report	Outlier 2015 Annual Report
Tameside Hospital NHS Foundation Trust	<p><b>Outlier Communication</b></p> <p>Tameside &amp; Glossop Integrated Care NHS Foundation Trust received a potential outlier notification for higher than expected rate of 2 year mortality scheduled to be published in the December 2016 National Bowel Cancer Audit Report.</p> <p>The Trust is concerned as the NBOCA mortality position is related to a historic dataset and will continue to repeat itself until the 2018 report, despite actions taken by the Trust to address the issues of incomplete and poor data quality. In addition to the data review, an MDT review of the 21 mortality patients identified from the 2013 data set was completed. This was to provide an assurance of the care delivered, to identify any areas of concern and establish any areas where lessons could be learned. The review also gave the level of understanding as to what had caused the higher than expected mortality rate and, whether the deaths were expected/unexpected and avoidable/unavoidable.</p> <p><b>Methodology:</b></p> <p>Following identification of all the patients in the cohort who had died, a retrospective case note review was completed using a specific mortality review proforma for the patients with bowel cancer aligned to the Trust Mortality Review process. The proforma incorporated identification of ASA, Charlson Score and T stage.</p> <p><b>Outcomes:</b></p> <p>Data Quality</p> <p>The review of these historic cases identified areas of data weaknesses in both the HES data (clinical coding of co-morbidities) populating Somerset and the quality of data submission to the audit platform. The team concluded that these weaknesses have affected the inclusion of risk factors for this cohort of patients, influencing the Trusts 2 year mortality outcomes performance.</p> <p><b>Clinical Reviews</b></p> <ul style="list-style-type: none"> <li>• 0 of the patient deaths identified were avoidable.</li> <li>• Average Age of patients reviewed was 72 years; (49 – 90), with only 3 patients being under the age of 60 years.</li> <li>• Average survival days for the 21 patients reviewed was 288.1 days, with a range of 0 – 705 days.</li> <li>• ASA classifications; a large percentage ASA 2, 42.9% (9/21), case note review challenged the accuracy of the ASA recording.</li> <li>• 38.0% (8/21) were emergency procedures.</li> <li>• 37.5% (3/8) of emergency procedures had an average age of 83 years and expected mortality ranging from 76.8% – 94.3% prior to surgery. All but 1 had multiple co-morbidities; the 1 remaining patient presented with severe sepsis and died of multi organ failure.</li> <li>• Of the remaining deaths these were attributed to unexpected complications, natural causes due to age group of patients, and other primary focus of cancer(s).</li> <li>• 28.6% (6/21) of patients had metastases at time of surgery, despite surgery and treatment 50% of patients developed metastatic disease.</li> <li>• 2 of the patients reviewed had previous cancer primary focus elsewhere.</li> <li>• 52.4% (11/21) of the patients reviewed had the tumour staged as T4.</li> </ul> <p><b>Actions:</b></p> <p>As a Trust we consider that the MDT review and resulting actions put in place are an appropriate way to address the outlier issue. The Trust is confident that its outlier status will resolve with the addition in time of these dataset time periods. It needs to be noted that the mortality reviews have not identified any issues in way clinical care was delivered.</p> <p>The latest report outcomes have already been discussed internally and brought to the attention of the Service Quality &amp; Governance Group, a further in depth report and action plan is to be completed to assure the quality of the data submitted prior to lock down.</p> <p>Validation of data submitted to NBCA has been further strengthened in collaboration with Clinical audit and Clinical coding teams with the clinicians to assure the validation of HES data with NBOCA data to assure the accuracy of future data submissions, with measures in place to prospectively monitor progress.</p>		

Two-year Mortality			
NHS Trusts	Comment	Outlier 2014 Annual Report	Outlier 2015 Annual Report
Weston Area Health NHS Trust	<p>Thank you for your letter received on 10 October 2016 advising us that our calculated 2 year mortality for patients undergoing resection of their bowel cancer in the period 2012/13 was 41.7% which reduced to 40.1% after appropriate risk adjustments were made. This risk adjusted mortality is in excess of the national average figure of 20.9% which indicates we are a significant outlier.</p> <p>We are, of course, very concerned by the possibility that our colorectal cancer service in 2012/13 was under-performing. We have undertaken a notes and audit review of all patients in this cohort to understand why the Trust is such a significant outlier.</p> <p>We have informed regulators (NHSI and CQC) and our Commissioners, and have invited a service review from the Royal College of Surgeons and detail below other immediate actions we have implemented.</p> <p><b>Data Quality</b></p> <p>As part of the review we re-collected all of the NBOCAP data fields, as we acknowledge that data collection 2 years ago was not as robust as required.</p> <p>Processes had already been put in place prior to you letter to improve data collection (which will be reflected in future audits).</p> <p><b>Uncorrected 2 year Mortality</b></p> <p>From the data we uploaded you identified 26 deaths from 79 patients in the two years following their bowel cancer resection.</p> <p>Having reviewed the data we can advise that one patient, who subsequently died, underwent a palliative stoma only, with no bowel resection. In addition, there are 4 patients whose date of death was more than 2 years after their primary bowel cancer resection.</p> <p>This would mean that there were, in fact, 21 deaths within 2 years of surgery in a cohort of 78 patients. Assuming that these deaths can be excluded from the mortality calculation, the unadjusted 2 year mortality would be reduced.</p> <p><b>Risk-adjusted 2 year Mortality</b></p> <p>From the data we uploaded you identified 14 patients (17.72%) with metastatic disease at the time of their primary bowel cancer resection. Review of the data has now identified a total of 16 patients (21%) with metastatic disease at the time of their primary bowel resection. The revised data collection shows that the Trust operates on a higher number of patients who present in A&amp;E, 24% (national average, 14.71%).</p> <p><b>Co-Morbidity</b></p> <p>The data collected relating to co-morbidities shows that our cohort of patients has a higher than national average level of co-morbidities. Of the patients operated on, 47% had 2 or more co-morbidities, rather than a lower rate (6.33%) as suggested by the data upon which your calculations were based. The national average for patients operated on with 2 or more co-morbidities is 9.25%.</p> <p>We would value the opportunity to update the data on the Somerset Cancer Register and re-submit this to you so that a recalculation of our mortality rate can be undertaken.</p> <p>Although we anticipate that any re-analysis of our data will bring our figures closer to the national average, we would wish to provide a service that is among the best.</p> <p>Actions that the team will now undertake to ensure that we are providing the best possible care for our patients include:</p> <ol style="list-style-type: none"> <li>1. We will review data quality within the MDT to ensure accuracy and early response to any issues identified.</li> <li>2. We will ensure that all the deaths will result in a notes review.</li> <li>3. We will ensure all elective patients who die &lt;30 days after surgery are reviewed within normal mortality and morbidity processes and, in addition, any thematic reviews are considered at an early stage.</li> <li>4. We will review the support given by physicians colleagues for emergency elderly patients who present in A&amp;E and require major surgery.</li> <li>5. We will work with partners to review how the number of patients presenting with advance cancer in A&amp;E can be reduced.</li> </ol> <p>We have already taken the opportunity to review our care with the local Cancer Alliance and will continue to work closely to understand all aspects of the clinical pathway for this group of patients.</p> <p>If there is anything further that we can assist with at this stage please do not hesitate to let us know.</p>		

<b>Two-year Mortality</b>			
<b>NHS Trusts</b>	<b>Comment</b>	<b>Outlier 2014 Annual Report</b>	<b>Outlier 2015 Annual Report</b>
<b>Royal Free London NHS Foundation Trust</b>	<p>Thank you for your letter dated 10 October 2016 regarding the above Audit and the information that the Royal Free Hospital was a potential outlier.</p> <p>We have reviewed the mortality of patients who underwent surgery during the period (1 April 2012 to 31 March 2013) under study. Twenty-five patients have been identified of which complete data is available on twenty-three. Three (12%) patients were peri-operative deaths and hence unexpected. Thirteen (52%) underwent palliative surgery from the outset and were hence predictable deaths. The average survival for this group was 384 days. A further seven (28%) patients (unpredictable) died from causes unrelated to colorectal cancer or colorectal cancer surgery an average of 287 days after surgery.</p>		
<b>Barnsley Hospital NHS Foundation Trust</b>	<ol style="list-style-type: none"> <li>1. Risk adjusted mortality of 36.6% based on a 2 year survival analysis compared with 20.9% for England and Wales is noted. The unadjusted mortality was 42%. No confidence intervals are stated but we are told that this will make the Trust an outlier.</li> <li>2. The results of the audit using survival analysis methodology i.e. Observed deaths/Follow up time in 2 year units %, do not correlate with other measures of risk adjusted mortality such as SHMI or HSMR. There were no specific alerts to the Trust regarding colorectal mortality at the time of the audit.</li> <li>3. ASA grade was only recorded in 64.7% of cases. This is likely to significantly affect the risk adjustment model particularly as there was above average comorbidity in this group of patients. It would be helpful to clarify if there was an attempt to extrapolate the ASA data using the multiple imputations chained equations method.</li> <li>4. The risk adjustment calculation is Observed deaths/expected deaths x average mortality (England and Wales). The expected deaths are calculated from the risk adjusted multivariate regression analysis with mortality as the dependent variable. One of the key components of the regression analysis is the Charlson index which is calculated from coded data sent to HES. 59.7% of Barnsley patients are said to have no comorbidity compared with a national figure of 53%. During the period of the audit the Trust had known problems with data quality particularly depth of coding, and there may be a significant underestimate of comorbidity which will affect the risk adjustment calculation.</li> <li>5. Data from Dr Foster shows only one surgeon as a slight outlier for 3 year mortality but that for all other surgeons mortality at 3 years is within normal limits. This is at odds with the impression of generalised increased mortality from bowel cancer within the trust.</li> </ol>		
<b>18-month Stoma Rates</b>			
<b>Strategic Clinical Networks</b>	<b>Comment</b>	<b>Outlier 2014 Annual Report</b>	<b>Outlier 2015 Annual Report</b>
<b>Greater Manchester, Lancashire and South Cumbria</b>	<p>Our colorectal clinical lead has provided the following comment:</p> <p>Stoma rates following rectal cancer resections are always very difficult to measure – there are a lot of confounding factors – starting with differing opinions as to which ones are actually counted as rectal cancers and lots of assumptions thereafter. The two trusts with the highest stoma rates are the two trusts that do the recurrent/advanced/pelvic exenteration surgery that will have much higher permanent stoma rates.</p>	*	*
<b>East Midlands</b>	<p>We thank the NBOCA for pointing out that the East Midlands strategic clinical network 18 month stoma rate is an outlier at 55.9%. It has only been pointed out that we are an outlier for this criterion and therefore presume that our abdominoperineal resection and other criteria rates are within range.</p>		
<b>The Christie NHS Foundation Trust</b>	<p>Thank you for your letter of 10th October 2016. We would expect The Christie to have an excess number of stoma due to the care mix.</p> <p>Of the 60 cases in the audit period, 21 were total pelvic clearances for heavily advanced disease and these would be expected to have a stoma. The stoma rate was 22/39 (56%) in the remaining cases. This is also higher than the UK average but our T4 rate is four times the average (28% v 7%) and is therefore to be expected.</p> <p>The Christie runs a tertiary, specialist, complex pelvic surgical service dealing with advanced malignancies. We expect our stoma rate to remain higher than the UK average in future years as a result of treating these complex and advanced cases.</p>		

18-month Stoma Rates			
NHS Trusts	Comment	Outlier 2014 Annual Report	Outlier 2015 Annual Report
United Lincolnshire Hospitals NHS Trust	<p>Thank you for the letter that has been sent to us informing us of our outlier status on a sole criterion (18 months stoma rates). We have previously (in the 2015 report) been flagged up as outliers in the same area and it was discovered that the analysis was based on flawed data submitted to you by the trust.</p> <p>I have copied a portion of the reply that I had sent to you last year. The data submitted to the NBCA in previous errors has been inaccurate as a large number of patients was missed off the submission, heavily skewing the data. No conclusion can therefore be drawn from it. The data platform for the NBCA was changed in 2014 and we were unable to add any retrospective data. The trust is therefore being declared an outlier due to the same analysis every year and next year also I would expect a similar issue. We have taken measures to make sure that more accurate data is submitted, and in future the skewed data will be diluted in good quality data resulting in better results for the trust and loss of outlier status.</p> <p>Please see below: 18 months stoma rates – The analysis of 18 month stoma rates shows similar issues. I have reproduced the contents of your letter in italics below:</p> <p><i>The report will be published in December 2015 and we wanted to notify you in advance of our findings. The Audit has found that your trust had a higher than expected rate of 18 month stoma. The adjusted 18 month stoma rate of 85.62% for UNITED LINCOLNSHIRE HOSPITALS NHS TRUST compares to an overall 18 month stoma rate for England of 49.7%. The unadjusted 18 month stoma rate at your trust was 80%.</i></p> <p>Following the receipt of this letter I requested you for more detailed data which you have kindly supplied in the form of an excel sheet to my nhs.net account. The data makes it clear that you have used 35 patients in your analysis. Once again, the data does not sound right as the numbers very small compared to the actual workload of the trust.</p> <p>I have forwarded your worksheet and various emails to our own IT department who have analysed the data on similar lines and found a wide variation between the NBCA figures and the trust's own data.</p> <p>According to our figures, the 18 month stoma rates are at 20.1% which is significantly better than your finding of a stoma rate of 80%.</p>		
Taunton and Somerset NHS Foundation Trust	<p>The Colorectal Team have now had a chance to review the measure of “stoma rate 18 months following rectal cancer surgery” where our unit is reported to be an outlier. We did identify some data inaccuracies, e.g. there were 24 additional cancers identified on our systems that did not appear in the NBOCAP data analysis for whatever reason.</p> <p>We felt that the potential reason for our outlier status was several-fold. Firstly, we had a higher number of patients operated on in the over 75-84 age group (30% locally v 23% nationally) and the over 84 age group (6.8% versus 3.3% nationally.)</p> <p>Secondly, we operated on patients with a higher ASA grade. ASA 2 was reported at 56% nationally, but locally only 32% of our patients were graded as such. 34% of our patients were graded as ASA 3, compared to 20% nationally.</p> <p>Thirdly, we operated on patients with a higher number of co-morbidities; two or more co-morbidities 9% nationally compared to 16% at Musgrove Hospital.</p> <p>We also felt that we had a lower defunctioning loop ileostomy rate following anterior resection with primary anastomosis, and therefore these patients may have been erroneously classified as awaiting stoma reversal/closure at 18months. We understand that there is a risk adjustment factored in to the figures when 90 day mortality is reported, but it seems uncertain that this is the case when it comes to reporting stoma rates at 18 months.</p> <p>We understand that the data is also historical and dates back from 2011 to 2014. We have since made changes to the delivery of rectal cancer surgery since Nov 2014, with this type of surgery now only being carried out by three surgeons in the Unit.</p> <p>Of note, is that two of the surgeons who currently do rectal cancer also have a large faecal incontinence practice, and as a consequence this probably has a bearing when counselling patients on the risk of poor bowel function and faecal incontinence, and its negative impact on quality of life should patients experience this symptom. The stoma rate at 18 months, taken in isolation, without any reference to continence levels and quality of life can give a somewhat misleading overall picture. Nevertheless, we will of course continue to monitor internally our in the coming 12 months.</p>		
East Kent Hospitals NHS Foundation Trust	No response received.		*

18-month Stoma Rates			
NHS Trusts	Comment	Outlier 2014 Annual Report	Outlier 2015 Annual Report
<b>Brighton and Sussex University Hospitals NHS Trust</b>	<p>Thank you for your communication from the National Bowel Cancer Audit which has identified our Trust as an outlier in terms of Stomas relating to large bowel surgery.</p> <p>We have been aware of the unacceptably long waiting times for stoma reversal procedures and have been working on measures to address the problem, some of which are set out below and focus on developing both our staffing and physical resource:</p> <ol style="list-style-type: none"> <li>1. Our general surgical medical team has been below capacity for some time but five Consultant surgeons have been appointed to the department in the last nine months and of these, three are colorectal specialists.</li> <li>2. There is clinical review of all patients with excessive RTT waits including those waiting to have stoma reversal to provide assurance that there is no harm.</li> <li>3. A new Emergency On Call arrangement commenced last month which includes daily Consultant Colorectal ward rounds and CEPOD sessions. The new system facilitates consultant colorectal surgeon led operating and decision making for all emergency patients. The expectation is that this will ensure that primary anastomoses are performed whenever possible and reduce the requirement for stoma reversal moving forward.</li> <li>4. Weekly clinical governance meetings for digestive diseases surgery commenced from April, 2016. All patients undergoing any complications relating to stomas, or indeed reasons for forming stomas are discussed in this forum.</li> <li>5. Plans to increase the capacity for stoma reversal surgery are under active consideration with the expectation of 'going live' in January 2017.</li> <li>6. Wherever clinically appropriate, patients awaiting stoma reversal surgery have been contracted out the private sector.</li> <li>7. Additional weekend operating lists commenced from June 2016 to accommodate some of these patients.</li> <li>8. Discussions are currently underway with neighbouring Trusts to negotiate further capacity where possible.</li> </ol> <p>I hope this information illustrates the focus that the Trust has on dealing with the current problem.</p> <p>I am also aware that you have received a personal note from one of the colo-rectal surgeons. If it is helpful, I would be very happy to arrange any direct meetings that you would wish with either the Operational or Clinical team.</p>		
<b>Lancashire Teaching Hospitals NHS Foundation Trust</b>	<p>On behalf of the Lancashire Teaching Hospitals NHS Trust Colorectal MDT I have reviewed patient data on 72 patients reported by NBOCA as having a stoma 18 month following a rectal cancer resection out of a total of 95 patients in this dataset reported as having had rectal resection.</p> <p>One patient was identified as having had a stoma closure in the private sector less than 18 months from resection. Based on these corrections to the data supplied to me, this equates to an 18 month stoma rate of 74.7%.</p> <p>Of the 72 patients reported as having persistent stomas 30 had undergone an AP resection due to the proximity of their tumour to the pelvic floor. I have reviewed the clinical and radiological findings of these patients and in all cases the decision to carry out AP resection appears appropriate. In an additional 8 patients a decision was taken to perform a Hartmann's procedure without intention of reversal either due to patient severe co-morbidity (5) or the presence of an advanced tumour and expectation of a palliative resection (3). This therefore resulted in a planned permanent stoma rate of 40%.</p> <p>In 23 patients (21 anterior resections and one emergency Hartmann's procedure) a decision was taken following surgery not to proceed to stoma closure. In 3 case this was due to the death of the patient, in 4 cases due to a high anaesthetic risk due to co-morbidity, in 5 cases due to progressive metastatic disease in 6 cases due to anastomotic complications and in 3 cases due to patients declining further surgery (on two occasions due to a perceived high anaesthetic risk).</p> <p>In 10 patient who's stomas were ultimately closed, closure was delayed beyond 18 months largely contributed to by prolonged chemotherapy (2), resection of metastases (1), anastomotic complications (3), patient choice (1) or health issues (1) though in a small number of cases a waiting list delay contributed to stoma closure taking place after 18 months. All but one of these patients, who had prolonged conservative management of a radiological leak, underwent stoma closure within 20 months.</p>		*

18-month Stoma Rates			
NHS Trusts	Comment	Outlier 2014 Annual Report	Outlier 2015 Annual Report
University Hospitals Birmingham NHS Foundation Trust	<p>Thank you for your letter of 10th October letting us know that our trust is an outlier in the percentage of stomas present at 18 months post-surgery for rectal cancer. The measure is a mixture of patients having a permanent stoma as a primary procedure and those who have been given a 'temporary' stoma which has not been reversed at 18 months.</p> <p>We have recently audited the latter and presented it at the ACPGBI meeting and I have attached the poster version. This audit was done across our trust and our neighbouring trust, Heart of England (HEFT), and, while it is not the whole picture, it does perhaps demonstrate some of the issues involved.</p> <p>Although the subgroup data is not presented, we found that our ileostomy reversal rate was a little lower than HEFT although not by as much as in your figures. This was not confined to particular surgeons and was for a mixture of reasons including recurrence, pelvic sepsis, patient preference etc. There was no clear difference between the two trusts in these reasons.</p> <p>The data from NBOCAP that you kindly provided does show that our rate of advanced cancers (T3 and T4) appears to be significantly higher than average. This would be in keeping with our practice as a tertiary hospital accepting locally advanced and recurrent cancers as well as those with liver and renal problems brought in via our colleagues in these specialty areas.</p> <p>More advanced cancers rectal are significantly more likely to require radiotherapy and to have recurrence and our audit suggests that these are both significant factors which increase the failure to close ileostomies. We would also suggest that the locally advanced and recurrent cancers are more likely to have permanent stomas upfront than a lower stage population, especially when combined with pelvic exenteration and/or sacrectomy.</p> <p>An additional factor may be the influence of the private sector. Some of our patients have their resection in our trust but choose to have the ileostomy reversal in one of the local private hospitals and I do not believe this date is capture in HES data (although I may be wrong).</p> <p>In summary, the increase rate of long term or permanent stomas is an area of which we were already aware and are investigating. We believe that it is multifactorial but probably reflects case mix rather than individual or group practice.</p> <p>We plan to look at our audit data further but it would be very useful if you were able to send us a breakdown of how many of these patients had permanent stomas upfront and how many had non-reversed 'temporary' stomas at 18 months so we could compare this to our own data.</p>		
Worcestershire Acute Hospitals NHS Trust	<p>I refer to your letter to Mr Stephen Lake, dated 10 October 2016 regarding the above. I have discussed this with Mr Lake and the colo-rectal team and my response is set out below:-</p> <p>Worcestershire Acute NHS Trust remains committed to improving its data entry into the National Bowel Cancer Audit.</p> <p>This process has improved since the creation of the countywide colorectal MDT in September 2013 and the single-site resection unit for the Trust (based at the Worcestershire Royal Hospital) in early 2014.</p> <p>The Trust remains concerned over its outlier status for 18 month stoma rates which currently comprises data predominantly from its pre-centralisation era, however have noted an improvement in its outlier position between the December 2015 Audit and the planned Audit publication in December 2016 (adjusted 18 month stoma rate 62.1% [2016] vs. 70.79% [2015] – National 18 month stoma rate unchanged at 49.7%.</p> <p>Recent internal audits of 18 month stoma rates for 2014-15 and 2015-16 gives the Trust confidence that its outlier status will resolve with the addition in time of these dataset time periods.</p> <p>The latest report figures have already been discussed internally and furthermore will be discussed with representatives of local commissioners at its Quality Governance Committee meeting after December 2016.</p> <p>I hope this response provides the appropriate assurance, please come back to me if you require any further information.</p>		*

18-month Stoma Rates			
NHS Trusts	Comment	Outlier 2014 Annual Report	Outlier 2015 Annual Report
Leeds Teaching Hospitals NHS Trust	<p>Thank you for your letter dated 10 October 2016 on behalf of the project team of the National Bowel Cancer Audit, advising us that you will be publishing your Annual Report in December 2016 and notifying us that Leeds Teaching Hospitals NHS Trust has a higher than expected rate of 18 month stoma.</p> <p>We have shared your letter with Mr Richard Baker, Consultant Colorectal Surgeon and Clinical Lead and I am aware that you have also written to Mr Baker about this directly. Mr Baker has examined the details in your letter and considered the potential causes of the higher than expected rate. I am aware that there has been a previous alert regarding 18 month stoma. We have discussed this with the clinical team at the Trust's Safety &amp; Outcomes Group where we received assurance on the processes that are in place to monitor patient outcomes regarding stoma formation and the actions that have been taken within the specialty to address this.</p> <p>Mr Baker and his team have looked at this again. The team have identified some errors in the data set where patients have been recorded as having a stoma at 18 months, but this has not been the case. They have also noted that Leeds Teaching Hospitals NHS Trust is a tertiary referral centre and therefore treats higher risk cases where the pathology and physiology require a stoma and more advanced tumours that have been referred from other centres and therefore there is a higher probability of permanent stoma in many cases.</p> <p>Notwithstanding this general observation the details in the report have been examined to identify potential learning opportunities and areas that may need to be further addressed by the clinical team. Mr Baker has reviewed the clinical data for the period in your report. In terms of the new published data (2013/14) there were 68 cases, 25 of which involved a stoma formation and 43 which did not. One of these cases was a hemicolectomy and was therefore excluded. Two of the cases did not have a stoma formed when these were reviewed. Twenty of these procedures were APERs; the histology for each of these cases has been reviewed, which has confirmed that all cancers were within 3cm of the dentate line except for two cases, which were at 4 and 5cm. The clinical team have concluded that they are therefore satisfied with the rate of APER. The number of tertiary referrals in this cohort of patients was 5; if these were excluded based on the high probability of permanent stoma formation this would bring the Trust back into the funnel plot. However, we acknowledge our results continue to show the stoma rate to be on the high end and we are continuing to monitor this.</p> <p>The clinical team have established a robust governance process for the review of all cases that result in the formation of a permanent stoma, including the decision to do a Hartmann's procedure and leaks that would preclude reversal of stoma. Mr Baker has established a specialty governance meeting that meets on a weekly basis to review the previous two weeks cases, including discussion about the reasons for creating stomas and the plans for these patients. This meeting is attended by the team of Colorectal Surgeons where there is opportunity to have peer discussions regarding the outcome and clinical decisions that have been made, enabling learning opportunities to be identified and share amongst the group.</p> <p>Thank you once again for your letter. I hope my response has assured you that we have undertaken a detailed review of the outcome relating to 18 month stomas for this period at Leeds Teaching Hospital NHS Trust. If you require any further information please do not hesitate to get in touch.</p>		

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