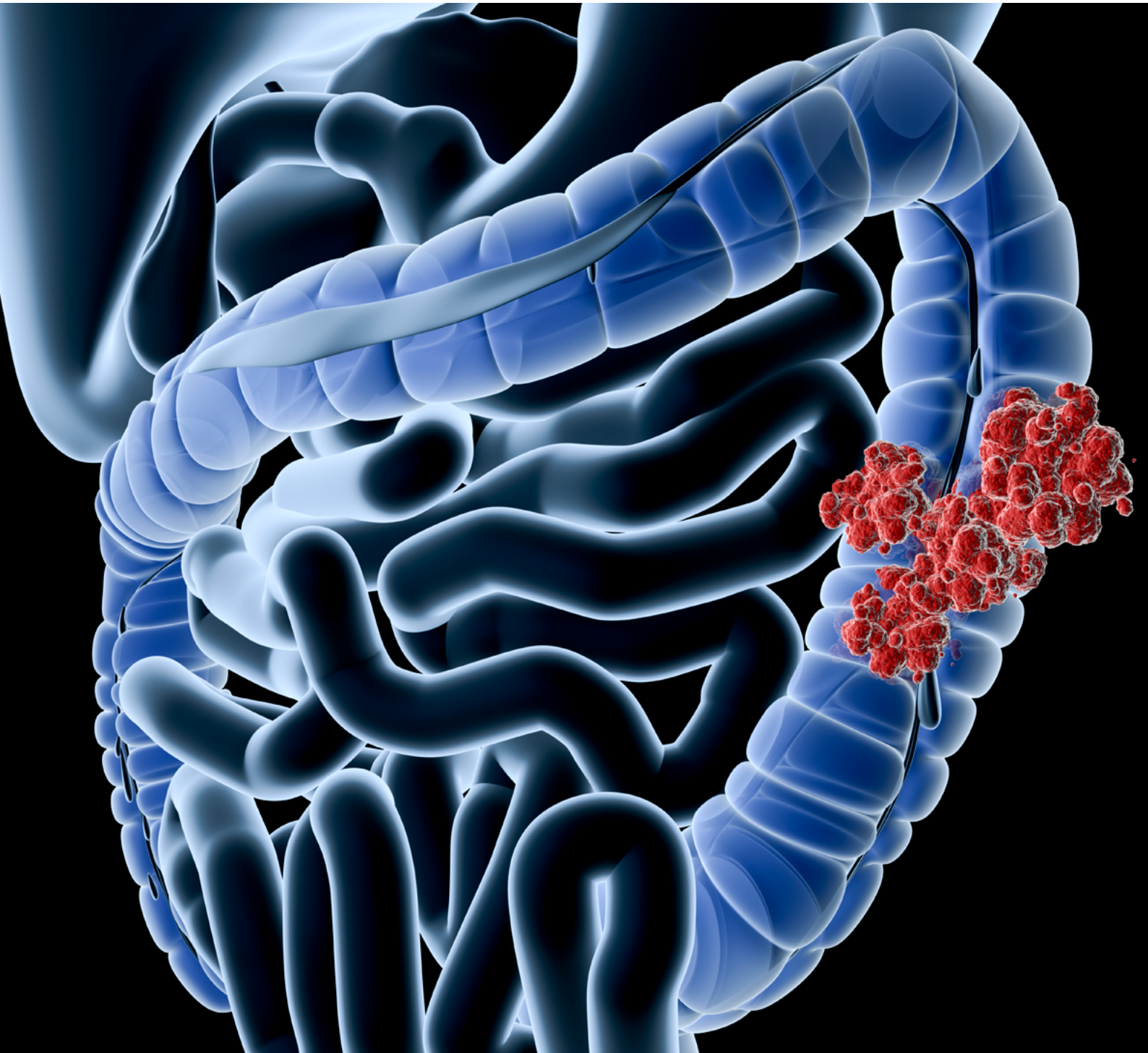
National Bowel Cancer Audit

Annual Report 2020

An audit of the care received by people with bowel cancer in England and Wales



Prepared in partnership with:

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 2020 Annual Report.

The Royal College of Surgeons of England 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 Royal College of Surgeons of England carried out the analysis of the data for the 2020 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. Its aim is to promote quality improvement in patient outcomes, and in particular, to increase the impact that clinical audit, outcome review programmes and registries have on healthcare quality in England and Wales. HQIP holds the contract to commission, manage and develop the National Clinical Audit and Patient Outcomes Programme (NCAPOP), comprising around 40 projects covering 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 projects, other devolved administrations and crown dependencies. www.hqip.org.uk/national-programmes

Contents

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 (RCS). The audit is funded by NHS England and the Welsh Government.

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

The NBOCA forms part of the National Gastrointestinal Cancer Audit Programme alongside the National Oesophago-Gastric Cancer Audit (NOGCA). The National Gastrointestinal Cancer Audit Programme has an overarching Project Board team with representatives from both audits. Each audit retains its own Clinical Advisory Group, Project Team, and Patient and Carer Panel.

The analyses and writing for this report were carried out by the NBOCA Project Team within the Clinical Effectiveness Unit of the Royal College of Surgeons of England (with support from NHS Digital), Miss Nicola Fearnhead (Consultant Colorectal Surgeon) and Dr Michael Braun (Consultant Oncologist).

The Project Board consists of a wide range of professionals who provide input from a diverse range of perspectives on the Annual Report, including patient representatives. Patient and bowel cancer charity representatives on the NBOCA Patient and Carer Panel provide input to NBOCA and have been involved in the production of the Patient Report.

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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The Project Board also includes members of the Bowel Cancer and OG Cancer Project Teams.

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Foreword

It is an honour to be invited to write the foreword to the 2020 NBOCA annual report. I must start by acknowledging the huge task required to produce the report and the numerous individuals involved, both from the Association of Coloproctology of Great Britain and Ireland and our partners from NHS Digital and the Clinical Effectiveness Unit at the Royal College of Surgeons of England. It is also important to highlight the input from our patient and carer panel, providing oversight and emphasising the patient focus.

The idea of auditing cancer outcomes has always been a priority for those involved in the care of bowel cancer patients as it clearly improves outcomes. It has been a pleasure to see the process develop from a relatively rudimentary project set up by a group of enthusiasts over 20 years ago to the high quality report that exists today.

It is reassuring to see that many core outcomes have remained constant or have shown incremental improvements over the years. However, there remains considerable regional variation in other outcomes such as length of stay and the use of neo-adjuvant therapy. Some individual trusts/hospitals/MDTs should reflect on potential reasons behind this variation.

Whilst the report has, for many years, analysed these core outcomes it has also consistently explored new outcomes. This year is no exception, with methodological developments allowing more inclusive data capture for adjuvant chemotherapy, cancer specific 2-year mortality and unclosed ileostomy rates in England and Wales. Data on mismatch repair testing and unplanned return to theatre are able to be reported for the first time. Following the new NICE recommendations and emerging evidence linking surgical volume and outcomes, initial exploratory work on rectal surgery volume by trust/hospital/MDT has been reported. Finally, and in keeping with broadening the scope of the audit, data on patients with dementia who are diagnosed with colorectal cancer has also been included.

The effect of COVID-19 on cancer care pathways cannot be ignored. Although the data included in this report pre-dates the pandemic, it will impact data interpretation of subsequent reports and continue to pose a substantial risk to bowel cancer patients well into the future. Of course, the meaningfulness of the data interpretation is only as good as the data that is submitted. I should therefore finish by encouraging all of us to provide accurate and up to date information for all patients diagnosed and undergoing bowel cancer treatment.

Steven Brown
President
Association of Coloproctology
of Great Britain and Ireland

1. Executive summary

1.1 Audit background

Bowel cancer is currently the second most common cause of cancer death in the United Kingdom (UK). The National Bowel Cancer Audit (NBOCA) aims to describe and compare the quality of care and outcomes of patients diagnosed with bowel cancer in England and Wales.

The 2020 Annual Report is the eleventh report to date and includes data on over 30,000 patients diagnosed with bowel cancer between 01 April 2018 and 31 March 2019.

The key audience of the Annual Report and the Patient Report is those who deliver care to bowel cancer patients, those who commission bowel cancer services, and patients along with their families and carers. At a regional level this includes English cancer alliances and Wales as a nation, and at a local level English trusts/hospitals and Welsh multidisciplinary teams (MDTs).

1.2 What the audit measures

The NBOCA collects data on items which have been identified and generally accepted as good measures of clinical care. It compares regional variation in outcomes between English cancer alliances and Wales as a nation. It also compares local variation between English NHS trusts or hospitals and Welsh MDTs. A summary of performance indicators measured in patients with bowel cancer is available via the hyperlink.

The majority of data items are collected by NHS trusts and hospitals in England as part of the Cancer Outcomes and Services Dataset (COSD). Risk adjusted outcomes reported this year include: 90-day post-operative mortality, 30-day unplanned readmission rate and two-year mortality.

1.3 Clinical Outcome Publication

The NBOCA publishes data at individual surgeon and trust level for English NHS trusts. This information will be available in early 2021 on the ACPGBI website as part of the Clinical Outcomes Publication (COP) programme. The COP programme represents an ambitious endeavour aimed to improve transparency around clinical outcomes. Work published in the British Medical Journal demonstrated that improved 90-day post-operative mortality coincided with the introduction of COP.

NBOCA will be publishing COP as usual this year as the time period covered includes patients treated up to 31 March 2019 and the data are therefore unaffected by the COVID-19 pandemic.

NBOCA will continue to report on outcomes for patients undergoing colorectal cancer treatment before, during and after COVID-19, but will not report at individual consultant level for periods of high COVID-19 intensity when normal services were most impacted.

1.4 Key findings

Chapter 3 – Care pathways

- One fifth of patients with colorectal cancer presented as an emergency; emergency patients had more advanced disease and were less likely to go undergo major resection.
- 61% of patients with stage III colon cancer in England and Wales received adjuvant chemotherapy, with considerable variation at trust/hospital/MDT level.
- 4% of patients diagnosed with colorectal cancer had an additional diagnosis of dementia. These patients had poor prognostic factors (older age, poor fitness and emergency presentation) and were less likely to have favourable outcomes compared to those without dementia.

Chapter 4 – Surgical care

- Over time, overall 90-day post-operative mortality has remained at 3.0% with one potentially outlying trust/hospital in this audit period following risk-adjustment.
- 90-day post-operative mortality in those patients undergoing emergency resection has improved from 14.7% in the 2013/14 audit period to 10.5% this audit period.
- Considerable variation in post-operative length of stay persists, with a median length of stay of 6 days (IQR 4 to 10 days) in the elective setting and 10 days (IQR 7 to 16 days) in the emergency setting.
- The overall rate for 30-day unplanned readmission was 11.6% with two outlying trusts/hospitals following risk-adjustment.
- The 30-day unplanned return to theatre rate was 8.4%. This has remained stable over time with an average rate of 8.2% over the last five audit periods. There was one hospital/trust above the outer funnel limit following risk-adjustment.
- Two thirds of all major resections were carried out laparoscopically, with approximately one third of emergency cases performed laparoscopically as well.
- Robotic surgery continues to increase with around 500 robotic cases recorded this audit year. 66 individual surgeons performed a total of 10 or less robotic resections, 15 surgeons performed between 11 and 20 cases, and 21 surgeons operated on more than 20 cases each.
- 57% of trusts/hospitals/MDTs are entering data on mismatch repair testing, with 12% of trusts/hospitals/MDTs entering data for at least 70% of patients.

Chapter 5 – Survival

- Two-year all-cause mortality rates remained stable at 33% overall compared to 34% in the 2014/15 audit period, as well as stratified across different treatment modalities.
- For two-year all-cause mortality, fourteen trusts/hospitals/MDTs lay above the inner funnel limits and four of these were potential outliers above the outer limits.
- For two-year cancer-specific mortality, there were six trusts/hospitals/MDTs lying above the inner funnel limits and two of these were above the outer limits.
- There was good agreement for outlier status between all-cause and cancer-specific mortality.

Chapter 6 – Rectal cancer

- Just under half of patients with rectal cancer underwent major resection, 7% had local excisional procedures, 7% non-resectional surgery, and the remainder did not have any surgical intervention.
- Overall, one third of rectal cancer patients received neo-adjuvant treatment, although large differences in the use and choice of neo-adjuvant radiotherapy was observed at regional level. Use of neo-adjuvant therapy varied according to region from 18% to 61%.
- For those patients receiving neo-adjuvant therapy, the proportion at trust/hospital/MDT level who had long-course chemoradiotherapy varied from 53% to 95%, and the proportion of patients who had short-course radiotherapy varied from 0% to 36%.
- 92% of patients undergoing rectal resection had negative circumferential resection margins.
- 35% of rectal cancer resections were abdominoperineal resections (APERs) or Hartmann's procedures, which lead to a permanent stoma, and just under 30% of patients undergoing anterior resection had an unclosed diverting ileostomy at 18 months with wide variation at trust/hospital/MDT level (5% to 65%).
- From next year, NBOCA will report on 18-month unclosed diverting ileostomy rate and permanent stoma procedure rates to inform quality improvement by separating out factors influencing stoma rates.
- The annual median volume of rectal resections at trust/hospital/MDT level was 25 (IQR 19-36), with 5% of sites not performing above this threshold, and at surgeon level was 5 (IQR 3-7).

1.5 Main recommendations

Number	Recommendation	Related National Guidance	Where in the report and rationale	Primary audience
1	Review and provide feedback to NBOCA on planned new performance indicators to include:			Individual English & Welsh MDTs
	a) Unplanned return to theatre within 30 days	The Fourth Patient Report of the National Emergency Laparotomy Audit 2018 – Executive Summary	Full report, Chapter 4, p40–42 To better understand serious post-operative complications and their impact on outcomes.	
	b) Two-year cancer-specific mortality	NICE: Colorectal cancer. [NG151] (January 2020)	Full report, Chapter 5, p52–53 To enable fairer comparisons of two-year mortality at provider-level.	
	c) 18-month unclosed diverting ileostomy rate d) Permanent stoma procedure rate	Association of Coloproctology of Great Britain and Ireland (ACPGBI): Guidelines for the Management of Cancer of the Colon, Rectum and Anus (2017)	Full report, Chapter 6, p58–61 To facilitate identification of areas for quality improvement with regards to stoma reversal.	
	e) Rectal surgery volume	NICE: Colorectal cancer. [NG151] (January 2020)	Full report, Chapter 6, p61–63 In line with updated NICE guidelines regarding minimum provider and surgeon-level volumes.	
2	Review and, where relevant, take action to improve participation, coding, data quality and timely reporting for the National Bowel Cancer Audit, particularly for:			Individual English & Welsh MDTs Institution-level Information Governance Commissioners
	a) Risk-adjustment variables (TNM/ASA)	Not applicable	Full report, Chapter 2, p17–18 8 trusts/hospitals/MDTs excluded from outlier reporting due to insufficient data.	
	b) Referral source	Not applicable	Full report, Chapter 3, p19–21 Variable proportions of 'unknown' referral source make interpretation difficult.	
	c) Pre-treatment TNM staging	NHS Long Term Plan for Cancer (2019) Cancer Delivery Plan for Wales (2016)	Full report, Chapter 3, p23 Data completion important for interpretation of pre-treatment staging	
	d) Robotic procedure	Not applicable	Full report, Chapter 4, p45–46 Robotic procedures are now recorded in a stand-alone data item.	
	e) Mismatch repair for all patients	NICE: Molecular testing strategies for Lynch syndrome in people with colorectal cancer. [DG27] (February 2017)	Full report, Chapter 4, p47 Data completion is important in all patients to allow reporting of this new data item.	
	f) Preoperative treatment field (particularly Welsh MDTs for whom there is no radiotherapy dataset)	NICE: Colorectal cancer. [NG151] (January 2020)	Full report, Chapter 6, p55–57 To better understand variations in radiotherapy use and ensure evidence-based local radiotherapy policies are in place.	

Number	Recommendation	Related National Guidance	Where in the report and rationale	Primary audience
3	Monitor and investigate regional and institutional variation in bowel cancer care and diagnostic pathways, focussing on:			NHS England Welsh health boards
	a) Variation in neo-adjuvant treatment in rectal cancer	NICE: Colorectal cancer. [NG151] (January 2020)	Full report, Chapter 6, p55–57 To better understand variations in radiotherapy use and ensure evidence-based local radiotherapy policies are in place.	Commissioners Care Quality Commission
	b) Proportion of patients presenting with stage 1 or 2 disease	NHS Long Term Plan for Cancer (2019) Cancer Delivery Plan for Wales (2016)	Full report, Chapter 3, p23 To aid the identification of regions where targeted improvements in diagnosis/screening/ referral might be required.	Bowel Cancer Screening Programme Bowel Screening Wales Bowel cancer charities Patients
	c) Variation in two-year survival.	NICE: Colorectal cancer. [NG151] (January 2020)	Full report, Chapter 5, p48–51 To aid the identification of regions / institutions where interventions may be required to reduce risk exposures, support healthy behaviours and mitigate the effects of socioeconomic deprivation in order to reduce regional variation in survival.	
	d) Rectal surgery volume; Trusts/MDTs should ensure that they are adhering to current NICE guidelines for minimum rectal cancer resections at both institutional (≥10 resections) and surgeon (≥5 resections) level	NICE: Colorectal cancer. [NG151] (January 2020)	Full report, Chapter 6, p61–63 To meet current NICE recommendations and provide further evidence on rectal cancer volume-outcomes.	

1.6 New to NBOCA for 2019

NBOCA response to updated NICE guidelines

An NBOCA response to the new National Institute for Health and Care Excellence (NICE) colorectal guidelines released in January 2020 is presented.

Adjuvant chemotherapy

Further development of the methodology for capturing adjuvant chemotherapy use has enabled more inclusive capture within England, as well as enabling us to report on adjuvant chemotherapy use in Wales for the first time using Patient Episode Database Wales (PEDW).

Patients with dementia

In keeping with broadening the scope of the audit, work looking at patients with dementia who are diagnosed with colorectal cancer has been carried out. This includes establishing who these patients are, what treatments they receive, and what their outcomes are.

Unplanned return to theatre

Following on from the initial development work in the 2019 annual report, this year unplanned return to theatre rates are reported at a trust/hospital/MDT level and will be outlier reported from 2021.

Mismatch repair

This data item is reported for the first time since it was added to the dataset in 2018/19.

Cancer-specific mortality

Following prior methodological development, we present both all-cause and cancer-specific two-year mortality rates at both cancer alliance/Wales and trust/hospital/MDT level. Cancer-specific mortality is not outlier reported.

Changes to 18-month stoma rate performance indicator

Previously, NBOCA reported on 18-month stoma rate for all rectal cancer resections including abdominoperineal resection (APER), Hartmann's and anterior resections. The feasibility of reporting two separate performance indicators has been explored: (i) 18-month unclosed diverting ileostomy rate for anterior resections, and (ii) permanent stoma procedure rate.

Rectal surgery volume

Given the new NICE recommendations and emerging evidence on surgical volume and outcomes, we have performed initial exploratory work looking at rectal surgery volume by trust/hospital/MDT.

Additional reports

NBOCA has published two short reports this year. The first looked at the use of cancer registry data to improve case ascertainment, and the second included methodological development for the capture of adjuvant chemotherapy using routine clinical data. NBOCA will publish two further short reports in 2020/2021.

A feasibility study for the use of Patient Reported Experience Measures (PREMs) was also published.

Peer-reviewed articles

NBOCA are involved in the ongoing publication of high-quality peer-reviewed articles. Most recently, a paper exploring determinants of variation in the use of adjuvant chemotherapy in stage III colon cancer patients has been published.

Twitter

Follow @NBOCA_CEU for regular updates, including any new publications.

Quality Improvement Initiative

NBOCA was due to launch its Quality Improvement Plan online and via interactive workshops at the ACPGBI 2020 conference. Unfortunately, this was not possible due to the COVID-19 pandemic. This has been postponed to 2021.

New Dataset Items for 2020-2021

Two new important data items have been added to the NBOCA dataset.

Transanal Total Mesorectal Excision (taTME) – was surgery performed via taTME?

Pelvic sidewall clearance – was this performed and, if so, which side was cleared?

Both of these data items will help to address gaps in the current knowledge of the use and outcomes of these surgical techniques. Given recent guidance from ACPGBI recommending a pause on taTME pending further evidence, collection of this data item is particularly important.

Other important changes to the NBOCA dataset

- Tumour height above anal verge for rectal cancers – value must be between 0-15cm
- Robotic surgery – option within surgical access rather than being its own data item

1.7 NBOCA response to NICE guidelines

Updated colorectal cancer NICE guidelines were published on the 29th January 2020. As a national audit, NBOCA strives to measure processes and outcomes of care in line with national guidelines where possible. This section of the annual report aims to highlight some of the pertinent changes to the NICE guidelines and, in particular, areas which are likely to be an important focus for future work by the audit.

NICE recommendation	Alignment with NBOCA work
1.2 Information for people with colorectal cancer	
Provide patients with information about their treatments (written & spoken) including benefits, risks, side effects and implications on quality of life, in a sensitive and timely manner	NBOCA will be linking to Patient Reported Experience Measures (PREMs) via the Cancer Patient Experience Survey (CPES) once up-to-date linked PREMs data are available. A feasibility study using historic CPES data has been carried out. This work looked at the potential for reporting PREMs as part of the annual report, nationally and as performance indicators
1.3 Management of local disease	
Adjuvant chemotherapy is recommended for stage III colon/rectal cancer. For rectal cancer, this recommendation is applicable only if the patient has had no neo-adjuvant treatments or short-course radiotherapy	NBOCA already reports rates of adjuvant chemotherapy for stage III colon cancer at hospital/trust level in England using SACT data. For the first time, this year NBOCA will also report on rates of adjuvant chemotherapy in Wales using new methodology developed for identifying chemotherapy in HES/PEDW. Further work is planned evaluating chemotherapy duration and acute toxicity.
Transanal TME should only be offered in line with specific criteria given the lack of clinical evidence about its safety and effectiveness	NBOCA is now collecting transanal TME as a data item to help inform future practice of this technique.
Consider referring people with locally advanced primary or recurrent rectal cancer that may need multi-visceral or beyond-TME surgery to a specialist centre to discuss exenterative surgery	NBOCA has collected detailed information regarding the provision of advanced disease services, which can be accessed in the 2019 Organisational Survey results.
Hospitals performing major resection for rectal cancer should perform at least 10 operations per year and individual surgeons should perform at least 5 operations per year	NBOCA is exploring rectal surgery volumes and outcomes. Some preliminary work is presented in this annual report.
1.4 Molecular biomarkers to guide systemic anti-cancer therapy	
Test for RAS and BRAF V600E mutations in all patients with metastatic colorectal cancer suitable for systemic anti-cancer therapy treatment	NBOCA is adding a dataset item from April 2021 for the collection of genomic tests including KRAS, NRAS and BRAF.
1.5 Management of metastatic disease	
Consider liver resection after MDT discussion; systemic anti-cancer therapy if having resection; systemic anti-cancer therapy and local ablative technique if unsuitable for resection but potentially curative. Consider metastasectomy, ablation or stereotactic body radiation after MDT discussion.	NBOCA are now collecting data on; MDT meeting type at which patient discussed Metastatic site Recurrence Non-primary metastatic site In addition, the NBOCA organisational survey maps those centres which provide on-site hepatobiliary and thoracic surgery. Previously published peer-reviewed work has looked in detail at patients undergoing liver resection. NBOCA will also be reporting on the proportion of stage IV patients undergoing liver resection as part of its Quality Improvement Plan.

2. Methods

An updated Methodology Supplement for 2020 is available. This supplement includes a description of the methodology used to estimate the three measures which have undergone outlier analysis this year. Potential outliers are managed following the NBOCA Outlier Policy.

2.1 Data sources

Eligible NHS trusts/hospitals/MDTs in England and Health Boards in Wales submit data to the audit. To generate the audit report the NBOCA records are linked to multiple other datasets including Hospital Episode Statistics Admitted Patient Care (HES-APC), Patient Episode Database for Wales (PEDW), Office for National Statistics (ONS), the Radiotherapy dataset (RTDS), the Systemic Anti-Cancer Therapy dataset (SACT), National Cancer Registry data, the National Emergency Laparotomy Audit (NELA) and Intensive Care National Audit and Research Centre (ICNARC). RTDS, SACT and National Cancer Registry data are only available for patients treated in England.

In England, 89% of colorectal cancer patients recorded in NCRAS were reported to NBOCA. In Wales, 110% of colorectal cancer patients recorded in PEDW were reported to NBOCA (there were more patients identified in NBOCA compared to PEDW).

2.2 National data opt-out (previously Type 2 Objections)

National data opt-out allows patients in England who do not want their personal confidential information to be used for purposes other than their individual care to register this fact with NHS Digital. This scheme replaced the registration of type 2 objections via GP practices in May 2018 (these were automatically converted).

The National data opt-out necessitates removal of patients from NBOCA and all linked datasets. This means that the overall number of patients for whom data is presented is lower than in previous years. It is estimated that approximately 900 patients have been removed for the 2018/19 audit period (Methodology Supplement Table 1). There is geographical variation in the distribution of patients that are excluded because of the National data opt-out.

2.3 Exclusions

All trusts/hospitals/MDTs submitted at least one patient. The majority of expected data had been submitted prior to the data linkage deadline in January 2020 but, due to the COVID-19 pandemic, data checking procedures and final data submission deadlines did not occur during Spring 2020. As a result, more trusts/hospitals/MDTs than usual have submitted low numbers of cases, low numbers of surgical procedures and/or incomplete pathology.

Overall, case ascertainment is similar to last year (Methodology Supplement Table 2) but the proportion of patients recorded as having a major resection is considerably lower than usual, at 55% this year in patients with linked data, compared to 61% last year (Table 4.1). Amongst patients recorded as having a major resection and with linked data, completeness of the 7 items used for risk-adjustment has remained similar to last year at 87% (Methodology Supplement Table 3).

Trusts/hospitals/MDTs with low submission for 2018–19:

The following trusts had submitted less than 10 cases overall:

- Mid Essex Hospital Services NHS Trust
- Gloucestershire Hospitals NHS Foundation Trust

Trusts/hospitals/MDTs with low submission for 2018–19 by linkage deadline:

The following trusts submitted low numbers of cases by the data linkage deadline, therefore had less than 10 linked surgical cases in the analysis extract:

- East Suffolk and North Essex NHS Foundation Trust - Colchester Hospital
- East Suffolk and North Essex NHS Foundation Trust - Ipswich Hospital
- King's College Hospital NHS Foundation Trust - Princess Royal University Hospital

Trusts/hospitals/MDTs with low numbers of submitted surgical cases:

The following trusts submitted greater than 10 cases prior to linkage deadline, but had less than 10 linked surgical cases in the analysis extract (there was just one trust with less than 10 surgical cases last audit period):

- Brighton and Sussex University Hospitals NHS Trust
- Dartford and Gravesham NHS Trust
- Dorset County Hospital NHS Foundation Trust
- Lancashire Teaching Hospitals NHS Foundation Trust
- Maidstone and Tunbridge Wells NHS Trust
- North Cumbria University Hospitals NHS Trust
- St George's University Hospitals NHS Foundation Trust
- The Princess Alexandra Hospital NHS Trust

Trusts/hospitals/MDTs with insufficient data for risk-adjustment:

The following trusts/hospitals/MDTs were excluded from the corresponding risk-adjusted analyses because overall data completeness was less than 20% or ASA grade and/or TNM stage was missing in more than 80% of patients included in the analyses.

The majority of these same trusts/hospitals/MDTs also had insufficient data for risk-adjustment last year. NBOCA has requested that these trusts/hospitals/MDTs provide a formal response this year (Appendix 2)

90-day mortality:

- East and North Hertfordshire NHS Trust (TNM)
- Hull and East Yorkshire Hospitals NHS Trust (ASA)
- London North West Hospitals NHS Trust (TNM)
- Southport and Ormskirk Hospital NHS Trust (TNM)
- South Tees Hospitals NHS Foundation Trust (TNM)
- The Queen Elizabeth Hospital, King's Lynn, NHS Foundation Trust (TNM)

30-day emergency readmission:

- East and North Hertfordshire NHS Trust (TNM)
- Hull and East Yorkshire Hospitals NHS Trust (ASA)
- London North West Hospitals NHS Trust (TNM)
- Southport and Ormskirk Hospital NHS Trust (TNM)
- South Tees Hospitals NHS Foundation Trust (TNM)
- The Queen Elizabeth Hospital, King's Lynn, NHS Foundation Trust (TNM)

Two-year survival:

- East and North Hertfordshire NHS Trust (TNM-M only)
- Hull and East Yorkshire Hospitals NHS Trust (ASA)
- Mid Yorkshire Hospitals NHS Trust (Overall <20% data completeness)
- University Hospitals Birmingham NHS Foundation Trust - Queen Elizabeth Hospital (TNM)
- The Queen Elizabeth Hospital, King's Lynn, NHS Foundation Trust (TNM)

Updated response to National Cancer Registry development work

Initial linkage between National Cancer Registry (NCRAS) data and NBOCA within the 2019 annual report showed that there was a difference in the number and type of patients captured by each data source. NCRAS patients who do not link to NBOCA tend to be older, die more rapidly after diagnosis and do not have a tissue diagnosis.

A short report, 'Using cancer registry data to improve case ascertainment' explored this further and concluded that improved linkage methods and an evaluation of data completeness were required prior to using NCRAS for complete case capture. Additional work has now been performed and NCRAS has been used as the denominator for case ascertainment for this audit period.

Initial work has been carried out to explore the possibility of updating missing staging from NBOCA with NCRAS data. Preliminary analyses showed that 49% of records match on tumour site and pathological staging, 37% on site alone, 10% on stage alone, and just 5% are different for both. In addition, if the pathological stage did not match, 70% had the same pre-treatment staging.

COVID-19 and future NBOCA reporting

The 2021 NBOCA Annual Report will primarily report on patients diagnosed between 01 April 2019 and 30 March 2020. The pandemic will have started to have had an impact during this period, and there will be an even larger impact for patients included in the 2022 Annual Report. The audit will review its statistical methods so that the impact of COVID-19 can be identified and distinguished from the typical results produced by providers/surgeons and, once the pandemic is over, future reporting is not biased by the effects of the pandemic.

Data on colorectal cancer outcomes during COVID-19 and the recovery phase will not be used for benchmarking of trusts/hospitals/MDTs nor for the Clinical Outcomes Publication.

Chapter Recommendations – Methods

- Trusts/hospitals/MDTs with insufficient data for risk-adjustment are encouraged to acknowledge the reason for this and subsequently aim to improve their recording of TNM staging and ASA grade to enable them to be included within outlier reported outcomes. NBOCA has requested that these trusts/hospitals/MDTs provide a formal response this year.

- NBOCA should continue development work to facilitate the use of NCRAS data alongside NBOCA data in the most appropriate manner. Current plans include using NCRAS data to update missing TNM staging.

3. Care pathways

Chapter 3 – Key Findings

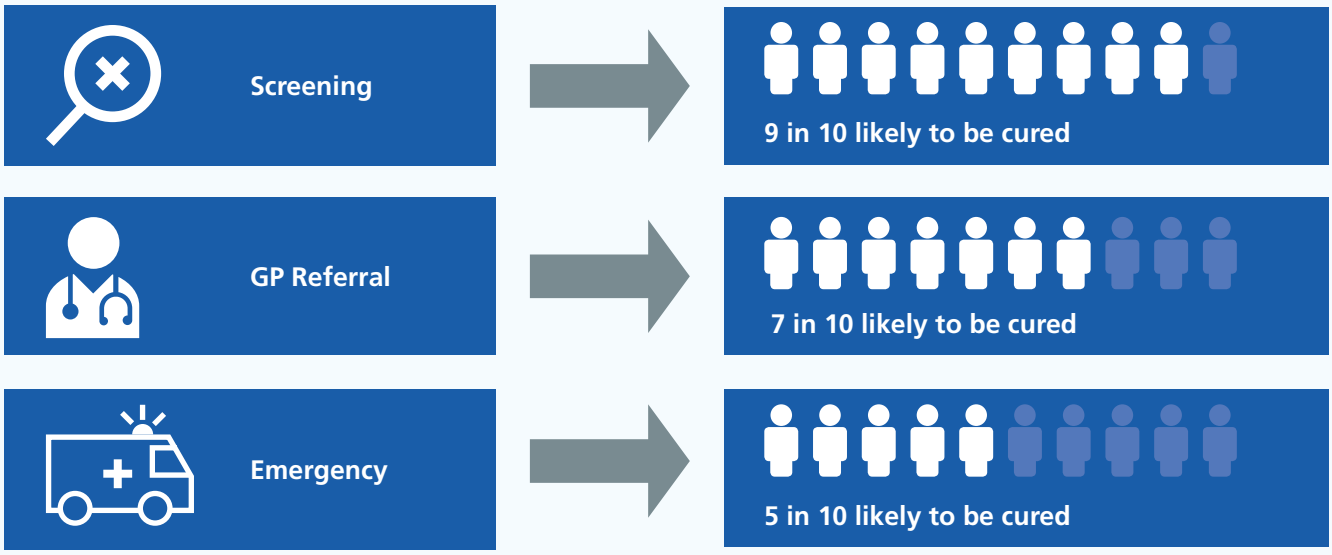
- One fifth of patients with colorectal cancer presented as an emergency; emergency patients had more advanced disease and were less likely to go undergo major resection.
- 61% of patients with stage III colon cancer in England and Wales received adjuvant chemotherapy, with considerable variation at trust/hospital/MDT level.
- 4% of patients diagnosed with colorectal cancer had an additional diagnosis of dementia. These patients had poor prognostic factors (older age, poor fitness and emergency presentation) and were less likely to have favourable outcomes compared to those without dementia.

3.1 Where were patients diagnosed with bowel cancer presenting?

Referral source

Infographic 1
How were patient diagnosed with bowel cancer?

The diagram shows how the proportion of patients that were likely to be cured, stratified by the source of referral.



The proportion of patients presenting via each modality between 01 April 2018 and 31 March 2019 was similar to in previous years (Table 3.1). The majority of patients were referred via GP (54%), followed by emergency presentation (19%) and then screening (10%). There remained a significant proportion of patients for whom the referral pathway is not known (18%) which limits further analyses.

Patients presenting as an emergency were more likely to be at the extremes of age, with 10% under the age of 50, and 18% aged 85 and over. Across referral groups, there was little difference in ethnicity, although there is a considerable proportion of missing data. Emergency referrals had a higher proportion of right-sided disease.

With regards to staging, emergency patients were considerably less likely to have early-stage disease. Of emergency patients, 66% presented with nodal disease, in comparison to 59% via GP and 44% via screening. Similarly, 36% of emergency patients presented with metastatic disease in comparison to 22% via GP and 11% via screening.

In keeping with the differences in staging between modes of referral, patients who presented as an emergency were less likely to have major resection or local excision compared to GP and screening referrals. Subsequently, 50% of patients that presented as an emergency underwent curative treatment compared to 69% of those referred via GP and 86% of those referred via screening.

Table 3.1
Description of the 29,766 patients diagnosed with bowel cancer between 01 April 2018 and 31 March 2019, by referral source

		Emergency Admission		GP Referral		Screening Referral		Other/ Not Known	
		N	%	N	%	N	%	N	%
Total no. patients		**5,565**		**16,013**		**2,853**		**5,335**	
Sex	**Male**	2,978	53.5	9,005	56.2	1,870	65.5	3,103	58.2
	Female	2,587	46.5	7,008	43.8	983	34.5	2,232	41.8
Age-group	**<50 yrs**	539	9.7	908	5.7	1	0.0	483	9.1
	50–64 yrs	713	12.8	2,110	13.2	218	7.6	744	13.9
	65–74 yrs	1,700	30.5	5,647	35.3	2,499	87.6	1,980	37.1
	75–84 yrs	1,595	28.7	5,304	33.1	126	4.4	1,563	29.3
	85+ yrs	1,018	18.3	2,044	12.8	9	0.3	565	10.6
Ethnicity*	**White**	4,155	93.6	12,668	94.9	2,248	94.9	4,097	94.5
	Mixed	17	0.4	48	0.4	7	0.3	16	0.4
	Asian	101	2.3	261	2.0	44	1.9	106	2.4
	Black	83	1.9	178	1.3	33	1.4	61	1.4
	Other inc. Chinese	81	1.8	200	1.5	38	1.6	56	1.3
	Missing (%)	1,128	20.3	2,658	16.6	483	16.9	999	18.7
Cancer site	**Caecum/ascending colon**	2,007	36.1	4,162	26.0	438	15.4	1,563	29.3
	Hepatic flexure	296	5.3	599	3.7	80	2.8	247	4.6
	Transverse colon	466	8.4	959	6.0	166	5.8	346	6.5
	Splenic flexure/descending colon	536	9.6	755	4.7	187	6.6	324	6.1
	Sigmoid colon	1,243	22.3	3,274	20.4	879	30.8	1,182	22.2
	Rectosigmoid	241	4.3	951	5.9	175	6.1	236	4.4
	Rectal	776	13.9	5,313	33.2	928	32.5	1,437	26.9
TNM version	**5**	1,302	23.6	3,218	20.2	572	20.1	1,056	19.8
	8	4,212	76.4	12,688	79.8	2,271	79.9	4,269	80.2
	Missing (%)	51	0.9	107	0.7	10	0.4	10	0.2
Pre-treatment TNM T-stage	**T1**	105	1.9	776	4.8	362	12.7	465	8.7
	T2	439	7.9	2,697	16.8	717	25.1	1,000	18.7
	T3	1,968	35.4	7,674	47.9	1,177	41.3	2,101	39.4
	T4	1,743	31.3	2,805	17.5	187	6.6	775	14.5
	Tx	847	15.2	1,448	9.0	261	9.1	655	12.3
	T9	420	7.5	535	3.3	97	3.4	291	5.5
Pre-treatment TNM N-stage	**N0**	1,907	34.3	6,583	41.1	1,604	56.2	2,415	45.3
	N1	1,594	28.6	5,166	32.3	750	26.3	1,487	27.9
	N2	886	15.9	2,506	15.6	248	8.7	609	11.4
	Nx	759	13.6	1,219	7.6	148	5.2	528	9.9
	N9	419	7.5	539	3.4	103	3.6	296	5.5
Pre-treatment TNM M-stage	**M0**	3,538	63.6	12,437	77.7	2,543	89.1	4,278	80.2
	M1	1,627	29.2	2,988	18.7	198	6.9	723	13.6
	Mx	86	1.5	160	1.0	23	0.8	58	1.1
	M9	314	5.6	428	2.7	89	3.1	276	5.2
Performance Status	**Normal activity**	1,638	36.2	6,984	49.8	1,644	68.2	2,173	51.1
	Walk & light work	1,230	27.2	4,254	30.4	607	25.2	1,225	28.8
	Walk & all self care: up >50%	788	17.4	1,851	13.2	126	5.2	570	13.4
	Ltd self care: confined >50%	673	14.9	811	5.8	29	1.2	248	5.8
	Completely disabled	190	4.2	113	0.8	6	0.2	40	0.9
	Missing (% of total)	1,046	18.8	2,000	12.5	441	15.5	1,079	20.2
Care Plan Intent	**Curative**	2,795	50.2	11,059	69.1	2,452	85.9	3,694	69.2
	Non Curative	1,608	28.9	2,653	16.6	111	3.9	601	11.3
	No Cancer Treatment	551	9.9	888	5.5	58	2.0	306	5.7
	Not Known	611	11.0	1,413	8.8	232	8.1	734	13.8
ASA grade**	**1**	332	11.0	1,066	10.8	330	15.1	456	14.1
	2	1,287	42.6	5,450	55.4	1,413	64.8	1,689	52.1
	3	1,155	38.2	3,105	31.6	413	18.9	1,016	31.3
	4 or 5	250	8.3	218	2.2	24	1.1	82	2.5
	Missing/Not Known (% of total)	2,541	45.7	6,174	38.6	673	23.6	2,092	39.2
Surgical Treatment	**Major Resection**	2,652	47.7	8,977	56.1	1,995	69.9	2,875	53.9
	Local Excision	43	0.8	512	3.2	259	9.1	296	5.5
	Stoma	225	4.0	502	3.1	14	0.5	77	1.4
	Stent	91	1.6	107	0.7	7	0.2	19	0.4
	Other	281	5.0	360	2.2	42	1.5	204	3.8
	None Reported	2,273	40.8	5,555	34.7	536	18.8	1,864	34.9

* Ethnicity obtained from NCRAS for patients with an NCRAS record and PEDW for patients diagnosed in Wales
**ASA grade only required if patient undergoes surgical treatment

Diagnosis from screening

During the audit period for the majority of patients in this report, patients aged 60-74 years old were invited to complete a home testing kit every two years. In August 2018, ministers agreed to lower the screening age to 50 within both England and Wales, although this is yet to be implemented. English patients could also request a home screening kit if they were aged 75 and over.

4.6 million patients in England were invited to participate in home screening from 01 April 2018 to 31 March 2019. This audit period, there was a slight increase in uptake rate from 58% to 60% (Young person and adult screening KPI data: annual (April 2018 to March 2019). In Wales, just under 300,000 patients were invited for screening. The uptake rate for Wales also increased slightly over this audit period from 56% to 57% (Bowel Screening Wales Annual Statistical Report 2018–19).

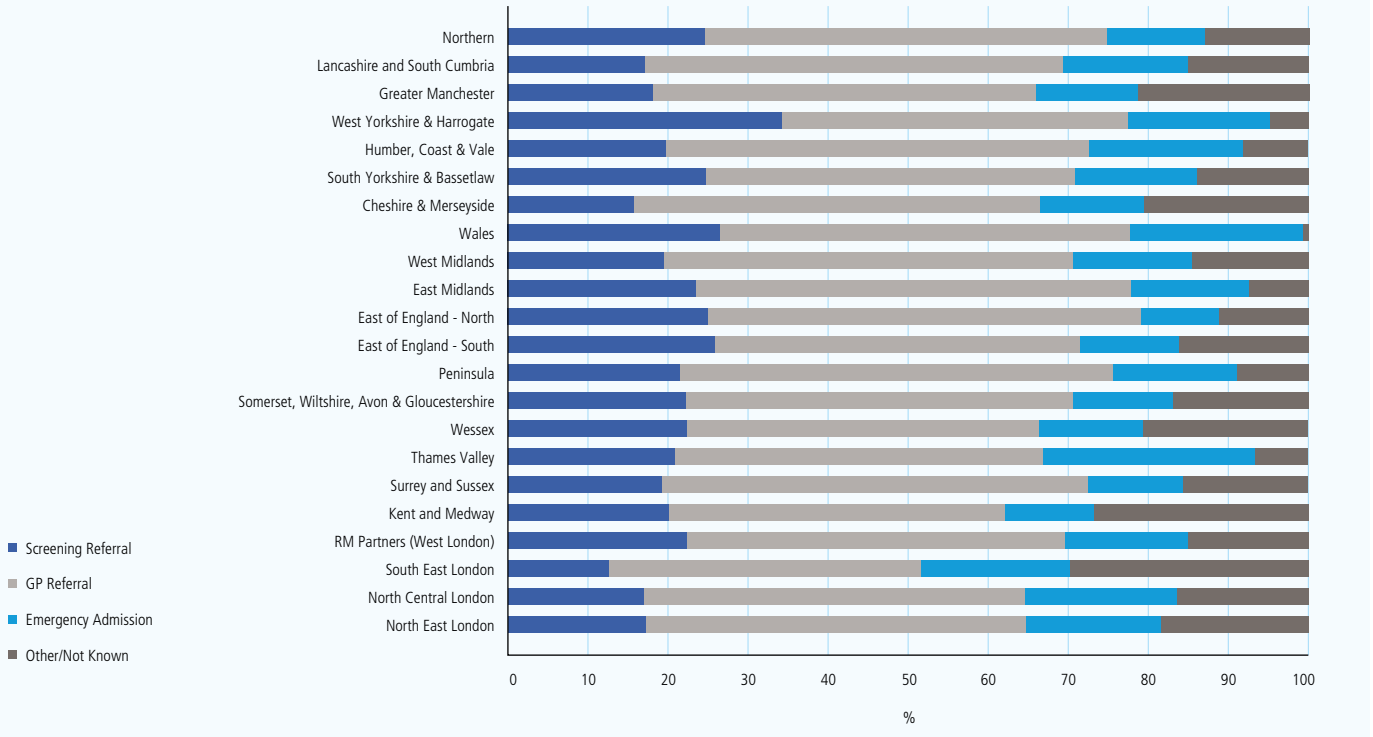
Faecal Immunochemical Test (FIT) was introduced to the screening programme in England from June 2019, and Wales had completed a phased roll-out in September 2019. FIT testing was also being offered nationally as a diagnostic adjunct as part of NICE DG30 guidance to test patients presenting without rectal bleeding but with low-risk unexplained symptoms.

Prior to the COVID-19 pandemic, NHS England had also begun rolling out the Bowel Scope screening programme. This involved a one-off flexible sigmoidoscopy for patients aged 55. NBOCA cannot currently distinguish patients diagnosed through screening who present via home testing kits or bowel scopes.

Geographical variation in screening diagnoses in eligible patients

There was wide geographical variation in the referral pathway amongst patients who were within the eligible age range for bowel cancer screening (Figure 3.1). The proportion of patients being referred via screening varied from 13% to 34%, and emergency presentations varied from 10% to 27%. However, there also remained considerable variation in the proportion of patients with unknown/other referral source, which limited further interpretation.

Figure 3.1
Referral source of the 11,793 patients aged 60 to 74 years diagnosed with bowel cancer between 01 April 2018 and 31 March 2019 by cancer alliance (England)/country (Wales)



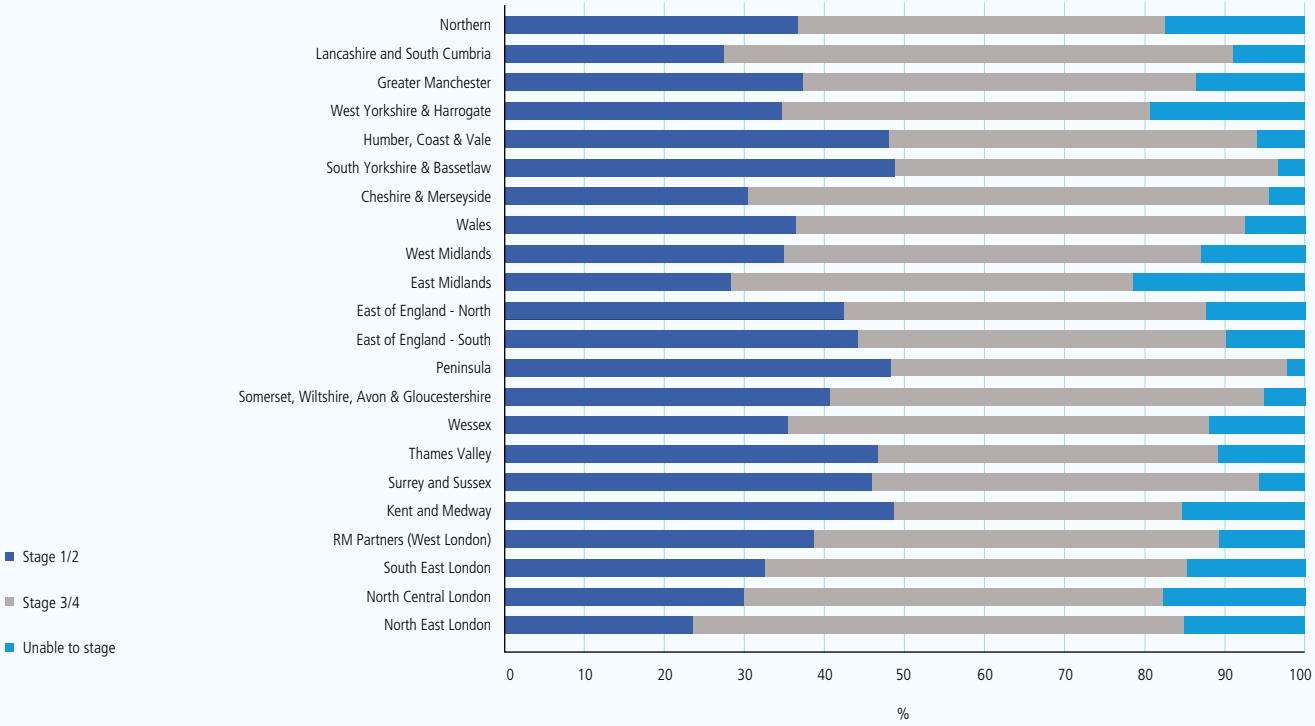
Recording of pre-treatment staging

One of the key ambitions in the NHS Long Term Plan for Cancer is that, by 2028, 75% of cancer patients will be diagnosed with stage 1 or 2 disease (before there has been spread to local lymph nodes or other organs). The detection of earlier, more treatable cancers is also a key focus of the Cancer Delivery Plan for Wales.

Accurate recording of pre-treatment staging is vital to enable NBOCA to investigate whether patients are receiving appropriate treatment after diagnosis and measure progress towards the goal above.

The proportion of patients that presented with stage 1 or 2 disease varied from 24% to 49% across cancer alliances/ Wales (Figure 3.2). The proportion of patients with missing pre-treatment staging also varies, and this makes interpretation of differences in stage at diagnosis difficult. Overall, 39% of patients were recorded as presenting with stage 1 or 2 disease. 11% of patients had unclassified staging meaning that, at most, 50% of patients could have presented with stage 1 or 2 disease, although the true figure is likely to be somewhere between 39 and 50%.

Figure 3.2
Pre-treatment staging of patients diagnosed with bowel cancer between 01 April 2018 and 31 March 2019 by cancer alliance (England)/country (Wales)



Stage 1: T1/T2, N0, M0, Stage 2: T3/T4, N0, M0, Stage 3: any T, N1/N2, M0, Stage 4: any T, any N, M1.
Unable to stage: missing N or M-stage

3.2 Major resection in patients with 'potentially curable' disease

The vast majority of colorectal cancer patients who present electively with non-metastatic disease would be expected to undergo major resection unless they had an early stage tumour amenable to local excision. Patients with colon cancer would be expected to proceed straight to surgery, in contrast to rectal cancer patients who may undergo various neo-adjuvant treatments.

Taking this into account, the definition of patients considered to have 'potentially curable' disease for this analysis was therefore patients who presented electively with stage T2 to T4 non-metastatic colon cancer. Further details are provided in the methodology supplement.

The proportion of these patients undergoing a major resection in the pre-screening (<60 years) and screening (60 to 74 years) age groups was 95% and 94% respectively, in comparison to 76% in those patients aged 75 and over (Table 3.2).

Across all age groups, those patients not undergoing major resection had a higher proportion of locally advanced disease (T4 stage). This was particularly evident in those patients aged under 60 years, with one third having T4 disease compared to one quarter of those aged 75 years and over. Patients aged under 60 years who did not undergo major resection were also more likely to have more advanced nodal disease, with 71% having N1 or N2 disease, compared to 48% in those aged 75 years and over.

Of note, in patients within the screening age group (60-74 years) undergoing major resection, where approximately one third are referred from screening, there is a higher proportion of T2 disease (27%) and lower proportion of T4 disease (15%), compared to the other age groups.

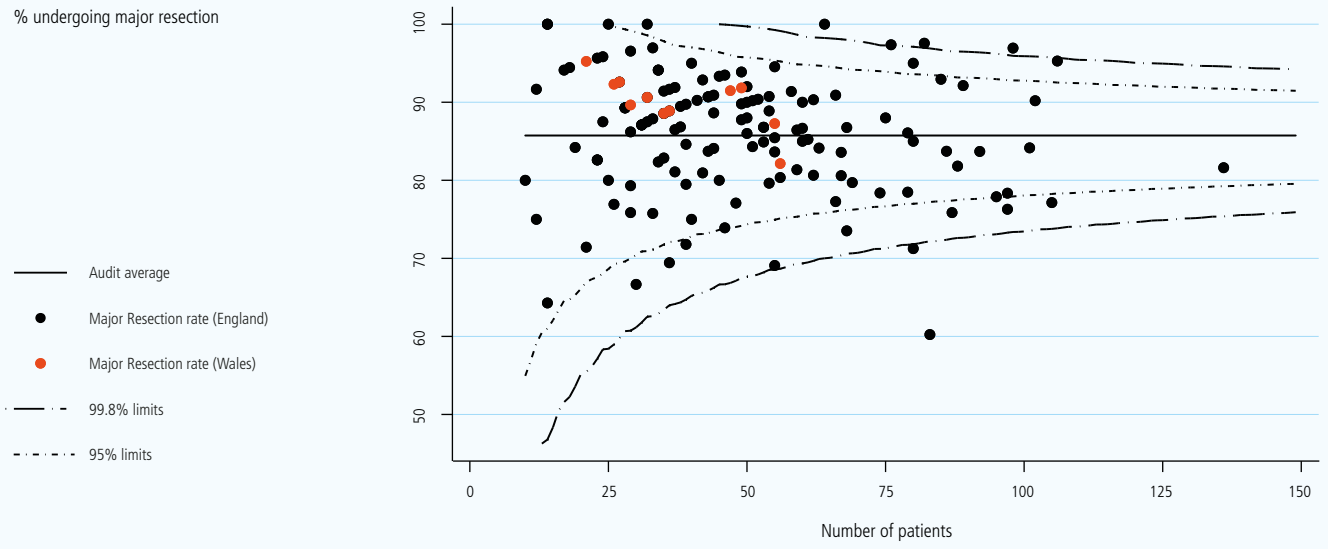
Patients in the groups aged 60 and over who did not undergo major resection tended to be considerably less fit and with a higher burden of comorbidities than those aged under 60. 57% of those aged 75 years and over who did not undergo major resection were unable to carry out any work activities (according to their performance status), in contrast to the small group aged under 60 where just 4% were unable to carry out any work activities. Of note, patients who did not undergo major resection had larger proportions of missing performance status.

A third of patients aged 75 years and over who did not undergo major resection had 2 or more comorbidities compared to less than a tenth of those aged 60 years and under. Additionally, none of the patients in the under 60 age group who did not undergo a major resection were recorded as undergoing CPET testing. These factors suggest that staging rather than fitness for surgery was the main determinant of treatment for those aged under 60.

Across all groups, one-year survival was higher in those who underwent major resection, although this rate decreased slightly with increasing age from 98% to 92%. For those aged 75 years and above, 1-year survival is poor for those who do not undergo major resection and this is likely attributable to a higher burden of comorbidities and reduced fitness. These factors, in addition to age, likely also explain the low rate of chemotherapy use.

There is considerable variation present between trusts/hospitals/MDTs in the proportion of patients that underwent major resection within this homogeneous group (Figure 3.3). 19 trusts/hospitals/MDTs fell outside the inner limits, although this has improved from 24 trusts/hospitals/MDTs previously.

Figure 3.3
Major resection rate in colon cancer patients with an elective presentation and stage T2 to T4 non-metastatic disease, by English NHS trust/hospital/Welsh MDT*



*Excludes 2 tertiary referral providers and 8 trusts with <10 patients fulfilling criteria

Table 3.2
Description of the 5,488 patients who presented electively with stage T2 to T4 non-metastatic colon cancer, diagnosed between 01 April 2018 and 31 December 2018, by age band and major resection

		< 60 years				60 - 74 years				>=75 years			
		MR		No MR		MR		No MR		MR		No MR	
		N	%	N	%	N	%	N	%	N	%	N	%
Total no. patients		**676**		**35**		**2,103**		**133**		**1,930**		**611**	
Sex	**Male**	383	56.7	18	51.4	1,163	55.3	86	64.7	936	48.5	312	51.1
	Female	293	43.3	17	48.6	940	44.7	47	35.3	994	51.5	299	48.9
Cancer site	**Caecum/ascending colon**	197	29.1	6	17.1	869	41.3	43	32.3	947	49.1	275	45.0
	Hepatic flexure	40	5.9	0	0.0	109	5.2	7	5.3	145	7.5	33	5.4
	Transverse colon	62	9.2	2	5.7	207	9.8	13	9.8	208	10.8	68	11.1
	Splenic flexure/descending colon	72	10.7	3	8.6	171	8.1	19	14.3	131	6.8	58	9.5
	Sigmoid colon	305	45.1	24	68.6	747	35.5	51	38.3	499	25.9	177	29.0
Referral Source	**GP**	636	94.1	32	91.4	1,389	66.0	95	71.4	1,885	97.7	609	99.7
	Screening	40	5.9	3	8.6	714	34.0	38	28.6	45	2.3	2	0.3
Pre-treatment TNM T-stage	**T2**	139	20.6	7	20.0	576	27.4	31	23.3	473	24.5	140	22.9
	T3	396	58.6	16	45.7	1,205	57.3	69	51.9	1,140	59.1	313	51.2
	T4	141	20.9	12	34.3	322	15.3	33	24.8	317	16.4	158	25.9
Pre-treatment TNM N-stage	**N0**	296	44.1	10	28.6	1,076	51.7	51	38.9	1,038	54.3	311	51.9
	N1	265	39.5	20	57.1	774	37.2	58	44.3	672	35.1	226	37.7
	N2	110	16.4	5	14.3	233	11.2	22	16.8	203	10.6	62	10.4
	Missing	5	0.7	0	0.0	20	1.0	2	1.5	17	0.9	12	2.0
Performance Status	**Normal activity**	481	77.8	24	80.0	1,239	65.7	46	41.4	669	39.5	57	11.6
	Walk & light work	113	18.3	4	13.3	507	26.9	31	27.9	702	41.4	151	30.8
	Walk & all self care: up >50%	21	3.4	1	3.3	116	6.2	16	14.4	271	16.0	159	32.4
	Ltd self care: confined >50%	3	0.5	1	3.3	23	1.2	18	16.2	52	3.1	123	25.1
	Completely disabled	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
	Missing (% of total)	58	8.6	5	14.3	218	10.4	22	16.5	236	12.2	121	19.8
CPET performed	**Not Recorded**	628	92.9	35	100.0	1,905	90.6	130	97.7	1,777	92.1	601	98.4
	Yes	48	7.1	0	0.0	198	9.4	3	2.3	153	7.9	10	1.6
Co-morbidities	**0**	428	67.1	17	77.3	1,024	50.6	47	52.8	762	41.7	112	33.5
	1	162	25.4	3	13.6	673	33.3	22	24.7	599	32.8	109	32.6
	2	37	5.8	1	4.5	234	11.6	8	9.0	287	15.7	58	17.4
	>=3	11	1.7	1	4.5	92	4.5	12	13.5	181	9.9	55	16.5
	Missing	38	5.6	13	37.1	80	3.8	44	33.1	101	5.2	277	45.3
Treatment received	**Other surgery**	0	0.0	9	25.7	0	0.0	32	24.1	0	0.0	65	10.6
	Chemotherapy	324	47.9	11	31.4	800	38.0	40	30.1	286	14.8	16	2.6
	None	0	0.0	20	57.1	0	0.0	76	57.1	0	0.0	535	87.6
Planned	**Specialist Palliative Care**	1	0.1	0	0.0	5	0.2	12	9.0	6	0.3	173	28.3
1 yr mortality from diagnosis date	**Alive**	646	98.0	26	92.9	1982	96.1	79	65.8	1722	91.3	324	55.8
	Dead	13	2.0	2	7.1	80	3.9	41	34.2	164	8.7	257	44.2
	Missing (%)	17	2.5	7	20.0	41	1.9	13	9.8	44	2.3	30	4.9

*restricted to December 2018 as chemotherapy data only available until March 2019

3.3 What proportion of patients undergoing major resection for stage III colon cancer receive adjuvant chemotherapy?

Updated National Institute for Health and Care Excellence (NICE) guidelines recommend the use of capecitabine and oxaliplatin (CAPOX), 5-fluorouracil (5-FU) and oxaliplatin (FOLFOX) or single agent fluoropyrimidine (capecitabine or 5-FU) as adjuvant chemotherapy for stage III colon cancer. Choice of chemotherapy should be dependent on staging, performance status, comorbidities, age and patient choice.

NBOCA has previously reported on the unadjusted rates of adjuvant chemotherapy use for stage III colon cancer in English hospitals/trusts using SACT and HES-APC data. This year, the methodology for ascertaining adjuvant chemotherapy regimens from HES-APC has been refined. Details of this development work can be found in this short report.

The updated methodology has been used this year to report on adjuvant chemotherapy rates for Wales for the first time using PEDW. Detailed methodology for this section of work can be found within the methodology supplement.

Geographical variation in adjuvant chemotherapy

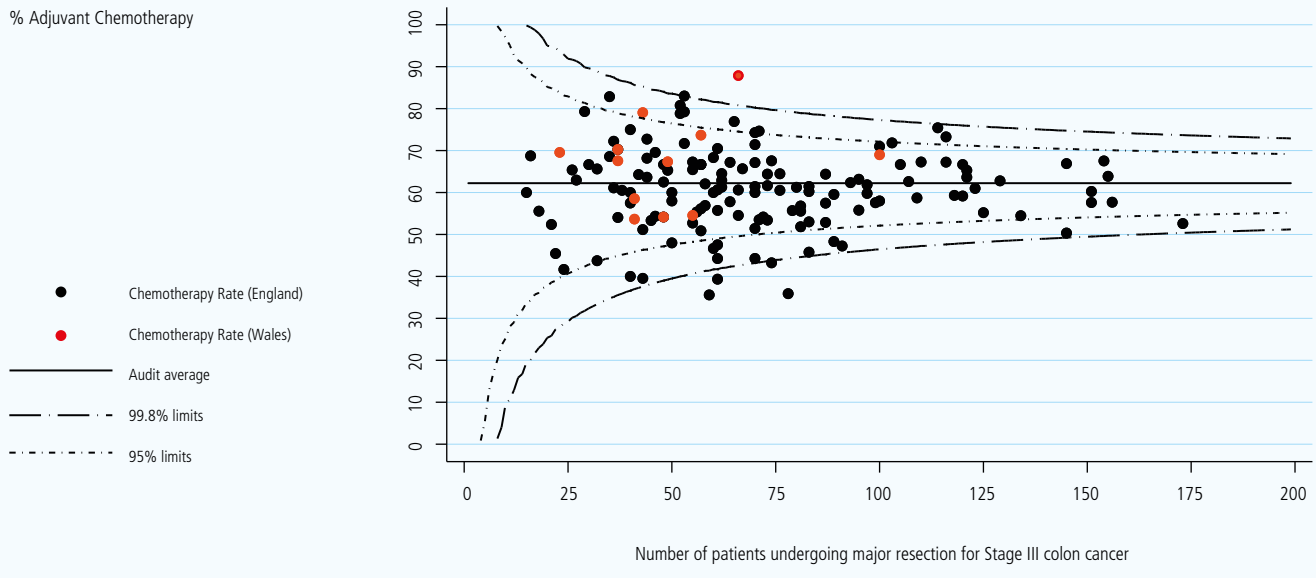
Overall, 61% of patients with stage III colon cancer received adjuvant chemotherapy. Unadjusted adjuvant chemotherapy rates varied for English cancer alliances/ Wales from 54% to 68%.

Figure 3.4 demonstrates variation in unadjusted adjuvant chemotherapy rates according to surgical trust at English hospital/trust level and for Welsh MDTs. Two trusts and one Welsh MDT were excluded because they had fewer than 10 patients.

There is considerable variation between trusts/hospitals/ MDTs with 27 sites outside the inner funnel limits and 6 of these outside the outer limits. This variation has improved compared to the last report where 12 sites were outside the outer limits.

The reduced variation may reflect the more robust methodology as well as improvements in SACT data quality in more recent years. The results from applying the methodology to PEDW are reassuring with the vast majority of Welsh MDTs lying within the funnel limits. However, there may also be some under-capture of chemotherapy within Wales due to PEDW being used in isolation compared to SACT and HES-APC within England. Some of the demonstrated variation may be partially explained by differences in case-mix and adequate risk-adjustment would be required prior to outlier reporting this measure.

Figure 3.4
Adjuvant chemotherapy in patients with stage III colon cancer by English trust/hospital and Welsh MDT for patients undergoing major resection between 01 December 2015 and 31 August 2018



3.4 Dementia in colorectal cancer patients

Colorectal cancer is primarily a disease of older age. Recent estimates suggest that the prevalence of dementia within England in those aged 65 and over is 4.3% and, given the ageing population, the proportion of bowel cancer patients with dementia is set to increase.

Colorectal cancer patients with an additional diagnosis of dementia are known to have poorer outcomes compared to patients without, but the reasons for this are unclear. There is a paucity of UK-specific data looking at these patients. This work establishes the characteristics of NBOCA patients with dementia, what treatments they receive, and what their outcomes are.

Which patients had a recorded diagnosis of dementia?

Within this cohort of patients aged 65 and over with a diagnosis of colorectal cancer, 4% also had a recorded ICD-10 code for dementia. Dementia diagnoses were restricted to ICD-10 codes occurring within 1 year prior to, or 90 days following, the NBOCA date of diagnosis so that any dementia diagnoses had the potential to affect subsequent treatments received by these patients.

Patients with a recorded diagnosis of dementia were considerably older than those without, with 41% of those with dementia aged 85 years and older compared to 17% of those without dementia (Table 3.3). These patients were also less fit and had a higher burden of additional comorbidities. Of those with a recorded diagnosis of dementia, 43% had a performance status of 3 or above, compared to 11% of those without dementia.

Patients with dementia were twice as likely to present as an emergency (45% vs 21%). Despite this, staging is similar between the two groups although there is more missing staging data for those with a record of dementia.

Which treatments did patients with a recorded diagnosis of dementia receive?

There were marked differences in the treatments received by patients with dementia, with just 25% undergoing major resection compared to 62% in those without dementia. The proportion of patients with dementia receiving stents was double that of those without (2.4% vs 1.1%). Overall, 62% of those with dementia had no recorded treatments.

What was the 2-year survival for patients with a recorded diagnosis of dementia?

2-year survival for patients with a recorded diagnosis of dementia was markedly worse than those without (Figure 3.5). Of patients with dementia, 30.7% (95% confidence interval 29.3% to 32.1%) remained alive at 2 years compared to 65.4% (95% confidence interval 65.1% to 65.6%) of those without dementia.

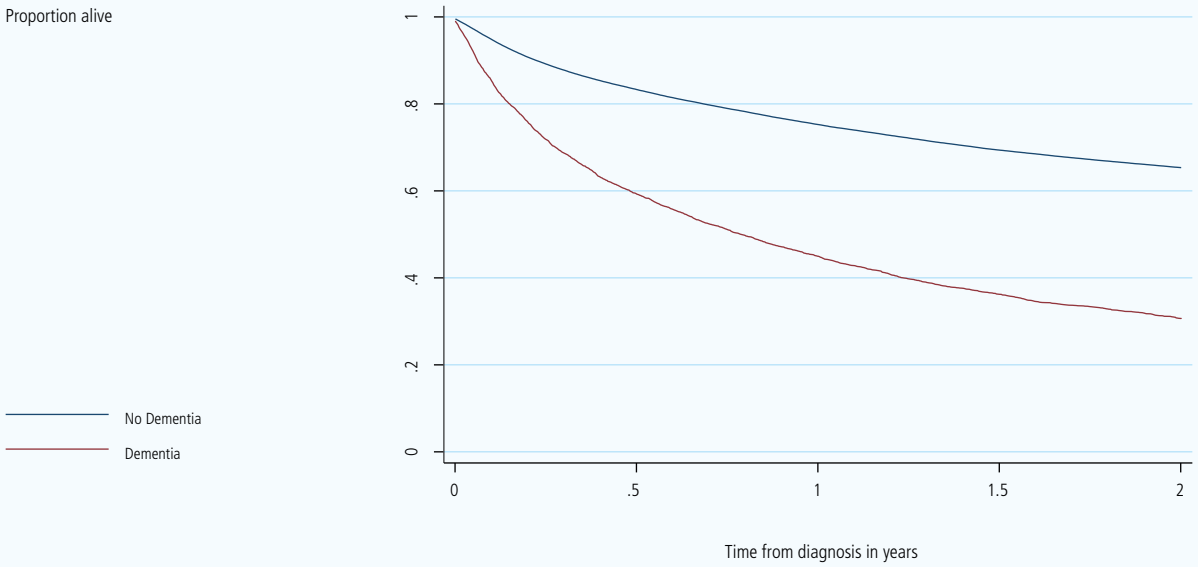
Patients with a diagnosis of dementia represent a heterogeneous group with a wide spectrum of cognitive decline and subsequent impact on daily functioning. Further work looking at the potential for stratifying these patients according to dementia severity would be helpful for better understanding of outcomes within this group. In addition, exploration of patient, tumour and hospital-level factors which might contribute to poorer survival, coupled with appropriate risk-adjustment of 2-year survival, would enhance understanding.

Table 3.3
Description of the 105,250 patients diagnosed with colorectal cancer between April 2014 and March 2018, by dementia status

		No Dementia		Dementia	
		Number	%	Number	%
Total no. patients		101,217		4,033	
Sex	**Male**	57,051	56.4	2,080	51.6
	Female	44,166	43.6	1,953	48.4
Age-group (years)	**65-69**	20,126	19.9	144	3.6
	70-74	22,743	22.5	314	7.8
	75-79	21,839	21.6	715	17.7
	80-84	19,737	19.5	1,205	29.9
	>=85	16,772	16.6	1,655	41.0
Performance Status	**0 - Normal activity**	29,198	36.6	299	9.9
	1 - Walk & light work	27,240	34.1	626	20.7
	2 - Walk & all self care: up >50%	14,705	18.4	802	26.6
	3 - Limited self care: confined >50%	7,429	9.3	1,020	33.8
	4 - Completely disabled	1,284	1.6	270	8.9
	Missing (% of total)	21,361	21.1	1,016	25.2
Additional comorbidities* (Charlson Score)	**0**	47,720	47.1	1,257	31.2
	1	31,331	31.0	1,255	31.1
	2+	22,166	21.9	1,521	37.7
Referral Source	**Emergency Admission**	20,845	20.6	1,821	45.2
	GP Referral	56,599	55.9	1,819	45.1
	Screening Referral	9,495	9.4	52	1.3
	Other	14,278	14.1	341	8.5
IMD Quintile	**1 (most deprived)**	14,963	14.8	754	18.7
	2	18,170	18.0	776	19.3
	3	21,612	21.4	876	21.8
	4	23,097	22.9	848	21.1
	5 (least deprived)	23,212	23.0	772	19.2
	Missing (%)	163	0.2	7	0.2
Cancer site	**Caecum/ascending colon**	29,688	29.3	1,287	31.9
	Hepatic flexure	4,451	4.4	154	3.8
	Transverse colon	6,916	6.8	291	7.2
	Splenic flexure/descending colon	5,993	5.9	273	6.8
	Sigmoid colon	22,219	22.0	817	20.3
	Rectosigmoid	5,231	5.2	213	5.3
	Rectal	26,719	26.4	998	24.7
Pre-treatment stage	**1**	16,007	15.8	475	11.8
	2	18,890	18.7	792	19.6
	3	29,222	28.9	975	24.2
	4	17,840	17.6	780	19.3
	Missing (%)	19,258	19.0	1,011	25.1
Surgical Treatment	**Major Resection**	62,463	61.7	1,188	29.5
	Local Excision	4,112	4.1	95	2.4
	Stoma	2,721	2.7	81	2.0
	Stent	1,107	1.1	98	2.4
	Other	2,347	2.3	88	2.2
	None Reported	28,467	28.1	2,483	61.6

* Excluding dementia

Figure 3.5
Two year survival from diagnosis, stratified by presence of dementia diagnosis, censored at 31st December 2018



Chapter Recommendations – Care pathways

- Trusts/hospitals/MDTs should review their current data submission for their tumour and surgery records to improve completion of (i) source of referral and (ii) pre-treatment TNM staging to help with the interpretation of variation in mode of referral and the proportion of patients diagnosed with stage 1 and 2 disease.

- Further work should be carried out by NBOCA to: explore the possibility of stratifying dementia status by severity; explore patient, tumour and hospital-level determinants of survival in dementia patients; and undertake appropriate risk-adjustment for survival within these patients.

4. Surgical care

Chapter 4 – Key Findings

- Over time, overall 90-day post-operative mortality has remained at 3.0% with one potentially outlying trust/hospital in this audit period following risk-adjustment.
- 90-day post-operative mortality in those patients undergoing emergency resection has improved from 14.7% in the 2013/14 audit period to 10.5% this audit period.
- Considerable variation in post-operative length of stay persists, with a median length of stay of 6 days (IQR 4 to 10 days) in the elective setting and 10 days (IQR 7 to 16 days) in the emergency setting.
- The overall rate for 30-day unplanned readmission was 11.6% with two outlying trusts/hospitals following risk-adjustment.
- The 30-day unplanned return to theatre rate was 8.4%. This has remained stable over time with an average rate of 8.2% over the last five audit periods. There was one hospital/trust above the outer funnel limit following risk-adjustment.
- Two thirds of all major resections were carried out laparoscopically, with approximately one third of emergency cases performed laparoscopically as well.
- Robotic surgery continues to increase with around 500 robotic cases recorded this audit year. 66 individual surgeons performed a total of 10 or less robotic resections, 15 surgeons performed between 11 and 20 cases, and 21 surgeons operated on more than 20 cases each.
- 57% of trusts/hospitals/MDTs are entering data on mismatch repair testing, with 12% of trusts/hospitals/MDTs entering data for at least 70% of patients.

4.1 How many patients died within 90 days of major surgery?

90-day post-operative mortality is defined as death within 90 days of the NBOCA date of surgery. Date of death is obtained from ONS.

90-day post-operative mortality over time

The proportion of patients who underwent major resection in this audit period was 55% compared to 61% in the 2017/18 audit period (Table 4.1). This is likely to be partially explained by reduced submission of surgical data due to the COVID-19 pandemic. There has been a significant downward trend in 90-day mortality from 3.8% in the 2014/15 audit period to 3.0% this audit period.

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

	2014–15		2015–16		2016–17		2017–18		2018–19	
	N	%	N	%	N	%	N	%	N	%
Total patients*	30,097		29,803		29,689		30,770		29,095	
Undergoing major resection**	18,978	63.1	18,759	62.9	18,705	63.0	18,703	60.8	16,111	55.4
Dead at 90 days after surgery, out of those undergoing major resection	727	3.8	645	3.4	647	3.5	587	3.1	476	3.0
Missing mortality	5	0.0	14	0.1	6	0.0	8	0.0	2	0.0

* Total patients entered onto CAP when patient identifiers sent for linkage to ONS/HES/PEDW: 671 patients were added to the 2018–19 cohort after linkage

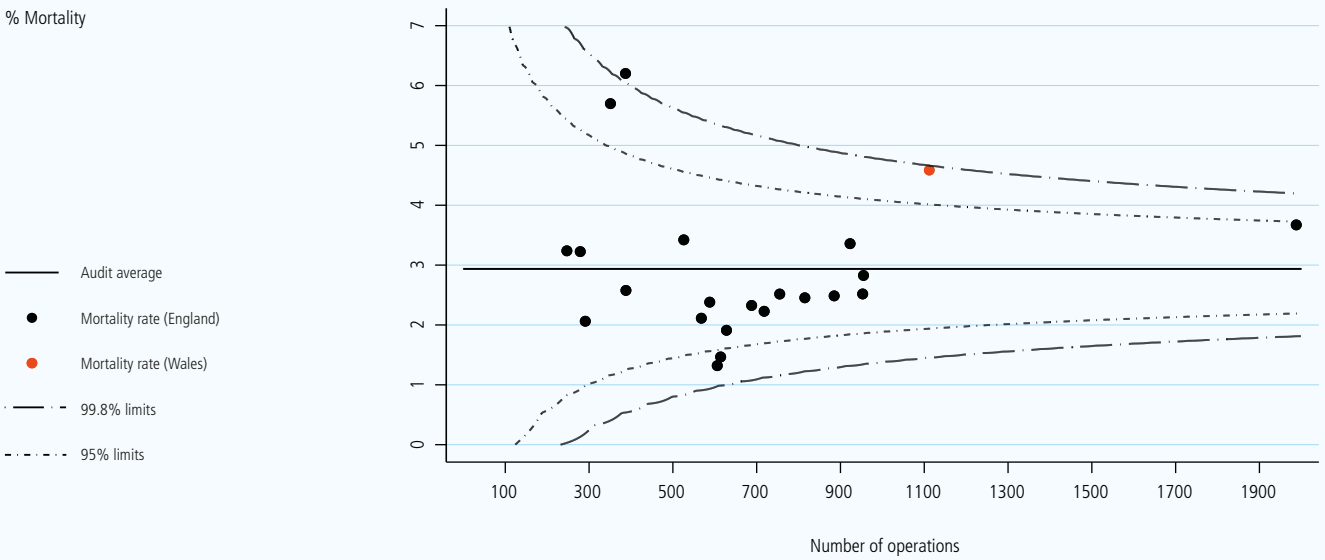
** 67 major resections occurring after 31st October 2019 excluded from 2018–19 as < 90 days follow-up in ONS available

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

Figure 4.1 shows observed and adjusted analyses for 90-day post-operative mortality for English cancer alliances and Wales. In 2017/18 there were no outliers on either observed or adjusted analyses. This year a single cancer alliance is a potential outlier following risk-adjustment.

Figure 4.1
Observed and adjusted 90-day post-operative mortality (elective and emergency admissions) by cancer alliance (England)/country (Wales) for patients diagnosed between 01 April 2018 and 31 March 2019

Observed 90-day mortality by cancer alliance (England)/country (Wales)



Adjusted 90-day mortality by cancer alliance (England)/country (Wales)

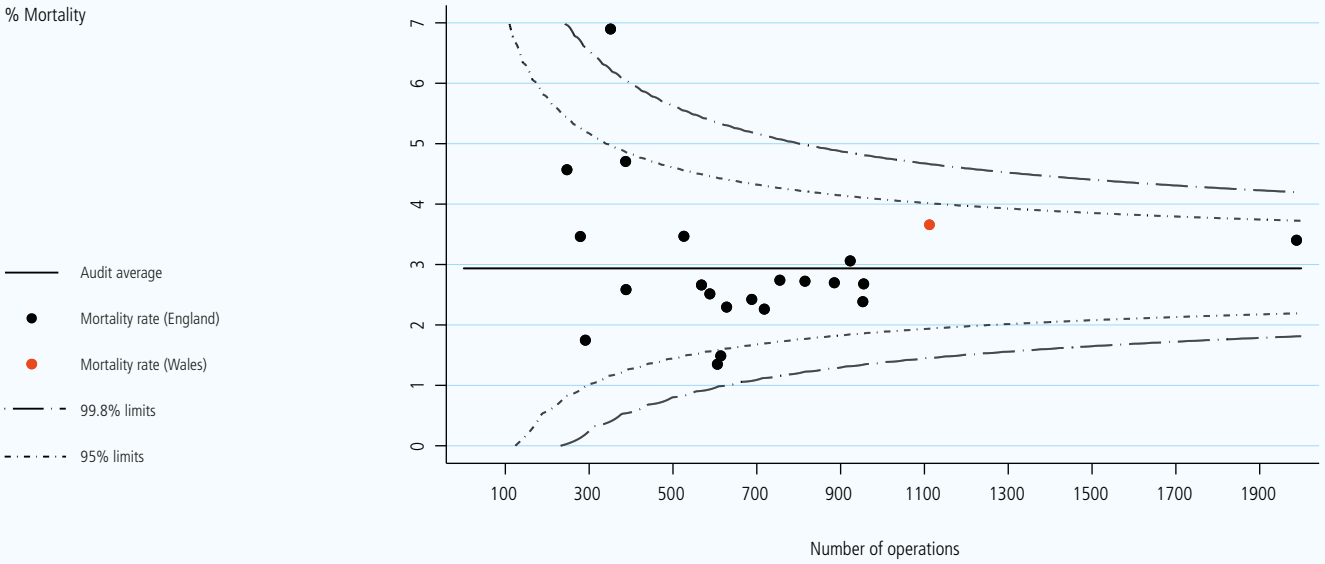
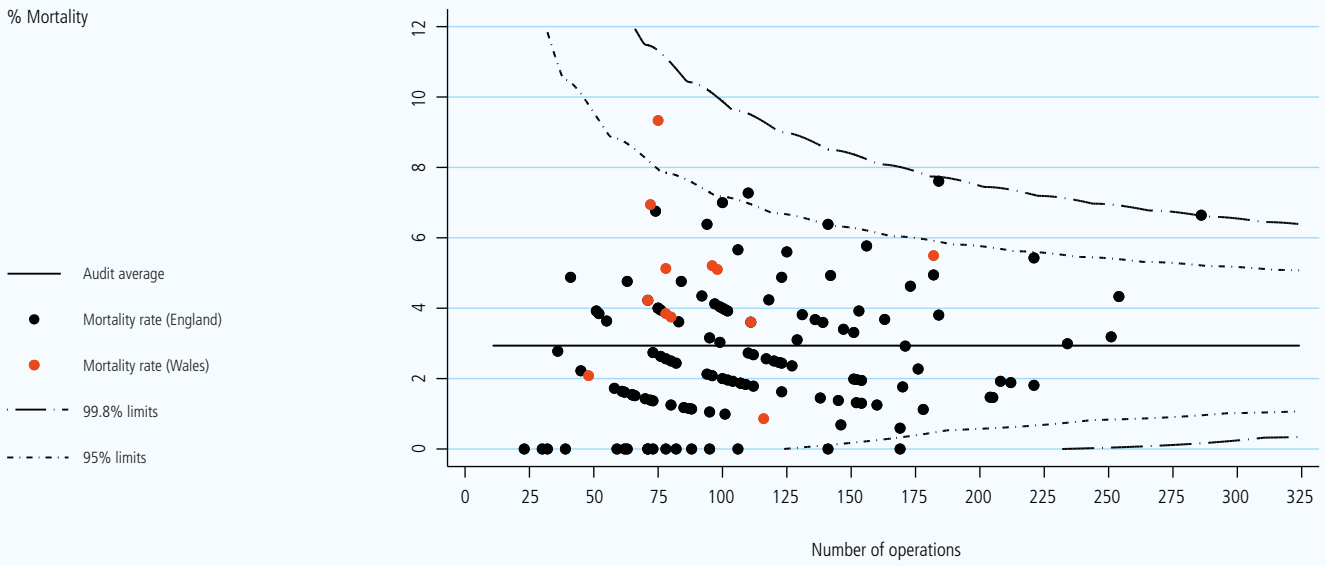


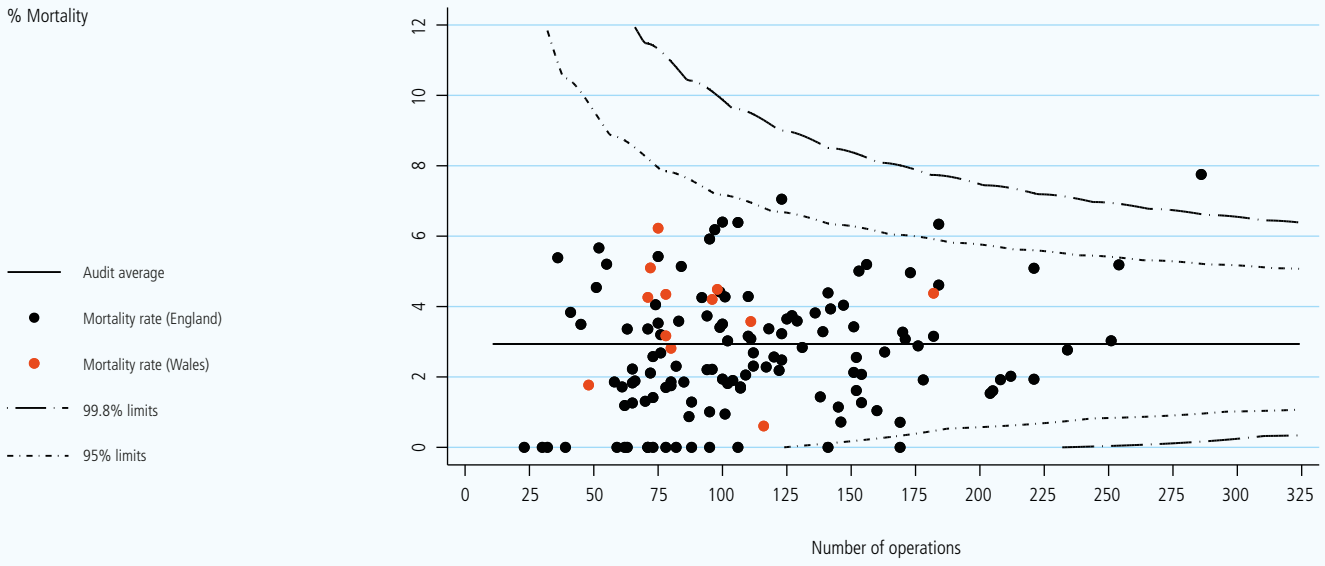
Figure 4.2 shows observed and adjusted 90-day post-operative mortality for English NHS trusts/hospitals and Welsh MDTs. In 2017/18 there were no outliers on either observed or adjusted analyses. This year there is a single outlying English trust/hospital following risk-adjustment.

Figure 4.2
Observed and adjusted 90-day post-operative mortality (elective and emergency admissions) by trust/hospital/MDT with more than ten operations for patients diagnosed between 01 April 2017 and 31 March 2018

Observed 90-day mortality by trust/hospital/MDT with more than 10 operations



Adjusted 90-day mortality by trust/hospital/MDT with more than 10 operations



90-day post-operative mortality according to operative urgency

Over time, there has been a slight reduction in the proportion of patients presenting as an emergency admission from 20.9% to 19.1% (Table 4.2). The total number of patients recorded within NBOCA is slightly reduced within this audit period, likely due to a combination of COVID-19 affecting data submission and the new National data opt-out.

Table 4.2
Emergency presentation in England & Wales (from HES/PEDW), by audit year

	2014–15		2015–16		2016–17		2017–18		2018–19	
	N	%	N	%	N	%	N	%	N	%
Total patients*	30,097		29,803		29,689		30,770		29,095	
Emergency admission	5,515	20.9	5,517	20.8	5,350	20.3	5,242	19.4	4,892	19.1
Elective admission	20,909	79.1	20,983	79.2	21,007	79.7	21,820	80.6	20,766	80.9
Missing (% of total)	3,673	12.2	3,303	11.1	3,332	11.2	3,708	12.1	3,437	11.8

* Total patients entered onto CAP when patient identifiers sent for linkage to ONS/HES/PEDW: 671 patients were added to the 2018–19 cohort after linkage

When 90-day mortality rates are stratified by surgical urgency, elective and scheduled surgery have improved slightly over time from 2.1% and 2.4% respectively in 2013/14, to 1.8% and 2.1% in this audit period (Table 4.3). A more significant improvement is demonstrated for urgent and emergency resections from 9.1% and 14.7% in 2013/14, to 6.6% and 10.5% respectively in this audit period.

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

		2013–14		2014–15		2015–16		2016–17		2018–19	
		N	%	N	%	N	%	N	%	N	%
Total patients undergoing major resection eligible for linkage		18,978		18,759		18,705		18,703		16,111	
Overall 90-day mortality*		727/18,973	3.8	645/18,745	3.4	647/18,699	3.5	587/18,695	3.1	476/16,109	3.0
90-day mortality by urgency of operation	Elective	258/12,213	2.1	233/11,726	2.0	244/11,709	2.1	210/11,889	1.8	192/10,565	1.8
	Scheduled	87/3,675	2.4	76/3,975	1.9	87/3,830	2.3	83/3,829	2.2	64/3,068	2.1
	Urgent	112/1,234	9.1	99/1,148	8.6	98/1,251	7.8	85/1,070	7.9	60/908	6.6
	Emergency	268/1,819	14.7	237/1,864	12.7	216/1,825	11.8	205/1,769	11.6	160/1,531	10.5
	Missing urgency of operation	2/32	6.3	0/32	0.0	2/84	2.4	4/138	2.9	0/37	0.0

* Some patients are missing mortality data due to Type 2 objections/National data opt-out, others due to ONS date of death occurring prior to the reported date of surgery. 67 major resections occurring after 31st October 2019 excluded from 2018–19 as < 90 days follow-up in ONS available.

4.2 How long did patients stay in hospital after major bowel cancer resection?

Trends in length of stay over time

Overall, following major resection the median length of inpatient stay is 7 days (IQR 5-11 days). For elective procedures this is 6 days (IQR 4-10 days) and for emergency procedures this is 10 days (IQR 7-16 days).

In those undergoing elective surgery, factors associated with an increased length of stay included increasing age, comorbid conditions, reduced fitness, rectal tumours and open procedures.

Geographical variation in length of stay

There is considerable variation in length of stay according to cancer alliance (England)/country (Wales) (Figure 4.3a and Figure 4.3b). For elective surgery, the proportion of patients who stay in hospital for 5 days or less varies from 28% to 49%. For emergency surgery, this varies from 5% to 24%.

The risk-adjusted proportion of patients with a length of stay of greater than or equal to 5 days by trust/hospital/MDT is reported in Table A.3.

Figure 4.3a
Length of hospital stay after elective major surgery in HES/PEDW by cancer alliance (England)/country (Wales)

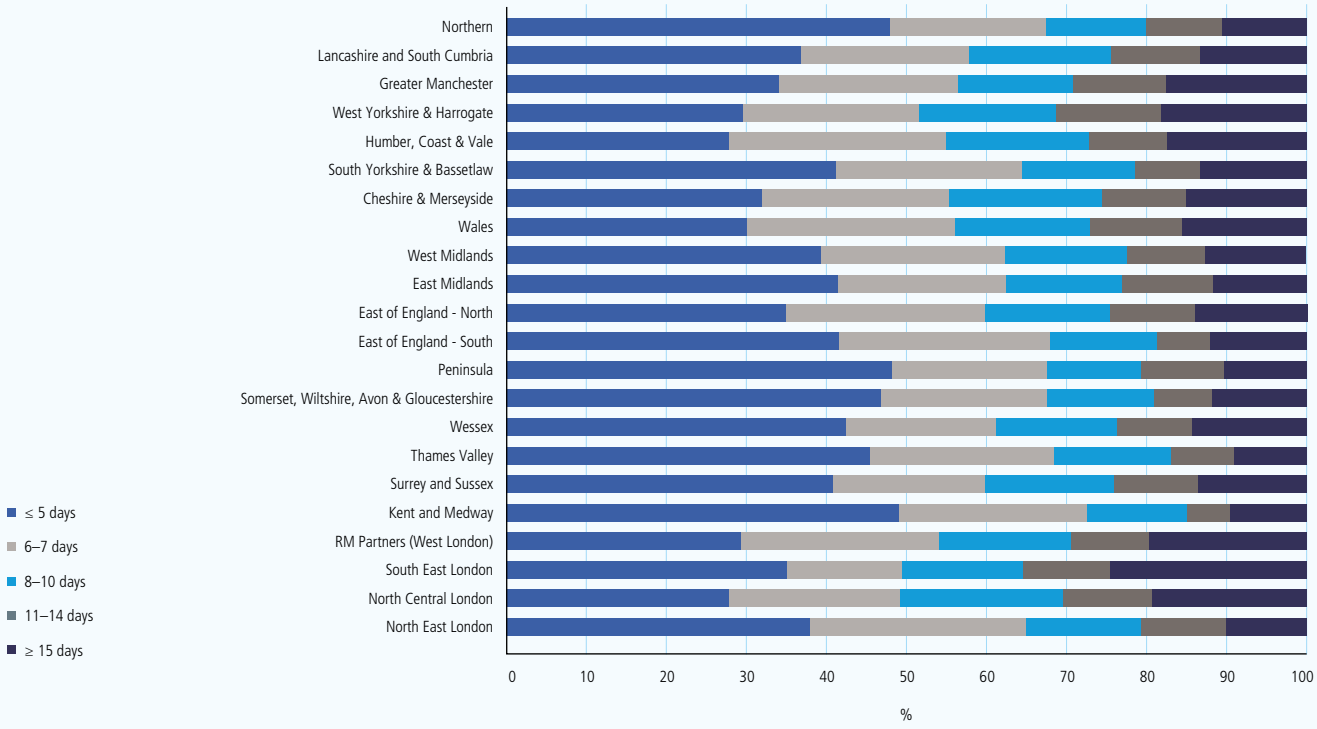
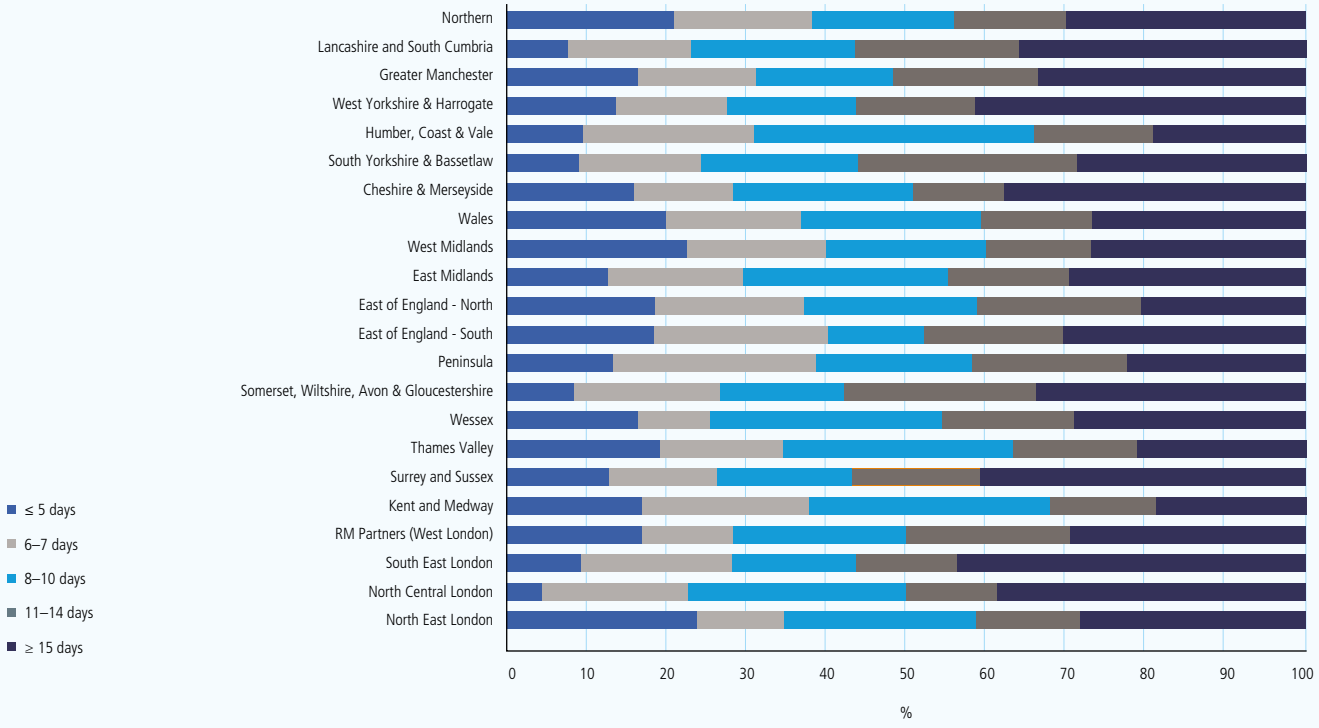


Figure 4.3b
Length of hospital stay after emergency major surgery in HES/PEDW by cancer alliance (England)/country (Wales)



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

30-day unplanned readmission after major resection is derived from HES/PEDW and is defined as an emergency admission to any hospital for any cause within 30 days of surgery. Emergency admissions include those via Accident and Emergency, general practitioners, bed bureaus (point of contact for GPs to arrange urgent admission), or consultant outpatient clinics.

Trends in unplanned readmissions within 30 days

The proportion of patients with an emergency readmission within 30 days of major resection has increased within this audit period to 11.6% (Table 4.4). However, this may be partially explained by a reduction in missing data from 7.3% in 2014/15 to 6.1% this audit period, as well as a reduced number of patients recorded as having major resection.

Table 4.4
Rate of unplanned readmission within 30 days of surgery for patients linked to HES/PEDW who underwent major resection in England and Wales on or before 31st October 2019, by audit year

		2014–15		2015–16		2016–17		2017–18		2018–19	
		N	%	N	%	N	%	N	%	N	%
Total patients undergoing major resection		**18,978**		**18,759**		**18,705**		**18,703**		**16,111**	
Emergency readmission within 30 days	**Yes**	1,792	10.2	1,779	10.1	1,837	10.5	1,872	10.7	1,755	11.6
	No	15,799	89.8	15,765	89.9	15,581	89.5	15,581	89.3	13,373	88.4
	Missing (% of total)	1,387	7.3	1,215	6.5	1,287	6.9	1,250	6.7	983	6.1

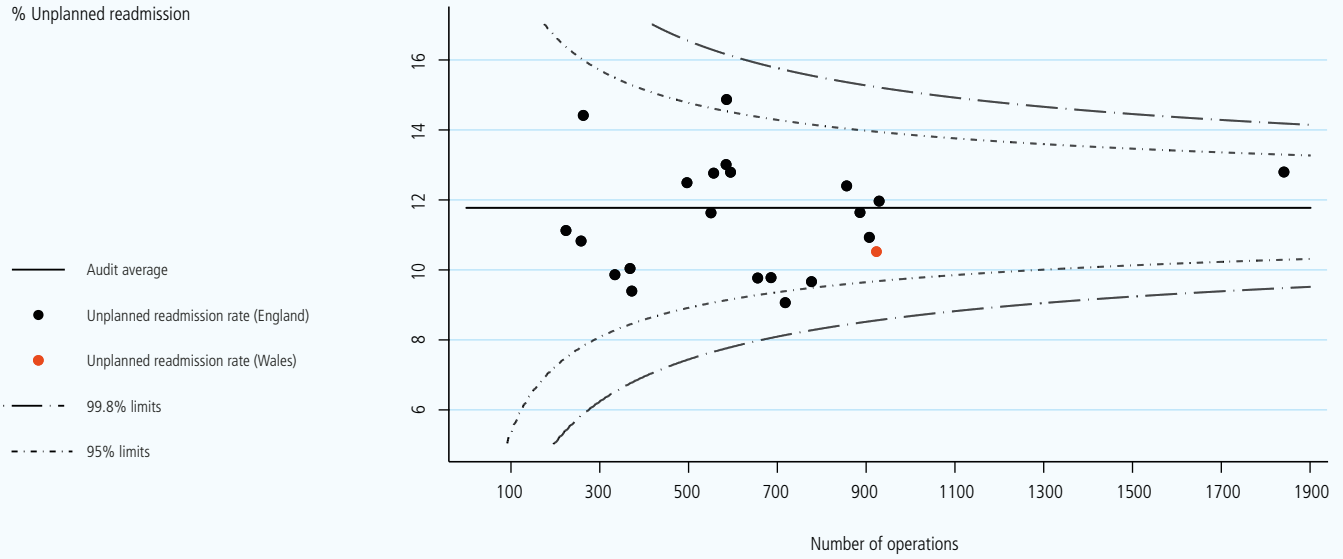
Geographical variation in 30-day unplanned readmission

Figure 4.4 shows the observed and adjusted rates of 30-day unplanned readmission at cancer alliance (England) and country (Wales) level. This audit period, variation has reduced. Following risk-adjustment, there are no potential outliers with one cancer alliance lying above the inner funnel limit only. This is an improvement in unplanned readmissions compared to the last audit period, when one cancer alliance and Wales both lay above the outer funnel limits and were therefore outliers.

Figure 4.5 shows the observed and adjusted rates of 30-day unplanned readmission by English trust/hospital and Welsh MDT. Variation has also reduced at this level. Following risk-adjustment, two sites are potential outliers compared to four sites during the last audit period. In total, seven sites lay above the inner funnel limits compared to ten sites last audit period.

Figure 4.4
Observed and adjusted 30-day unplanned readmission rate by cancer alliance (England)/country (Wales) for patients diagnosed between 01 April 2018 and 31 March 2019

Observed 30-day unplanned readmission rate by cancer alliance (England)/country (Wales)



Adjusted 30-day unplanned readmission rate by cancer alliance (England)/country (Wales)

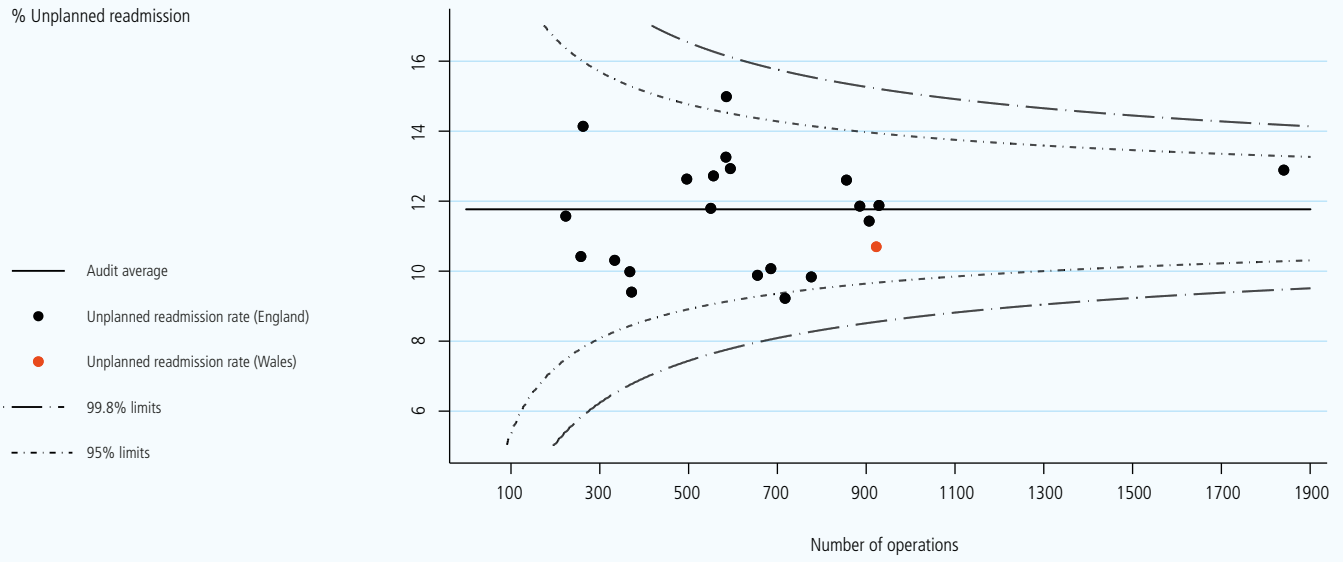
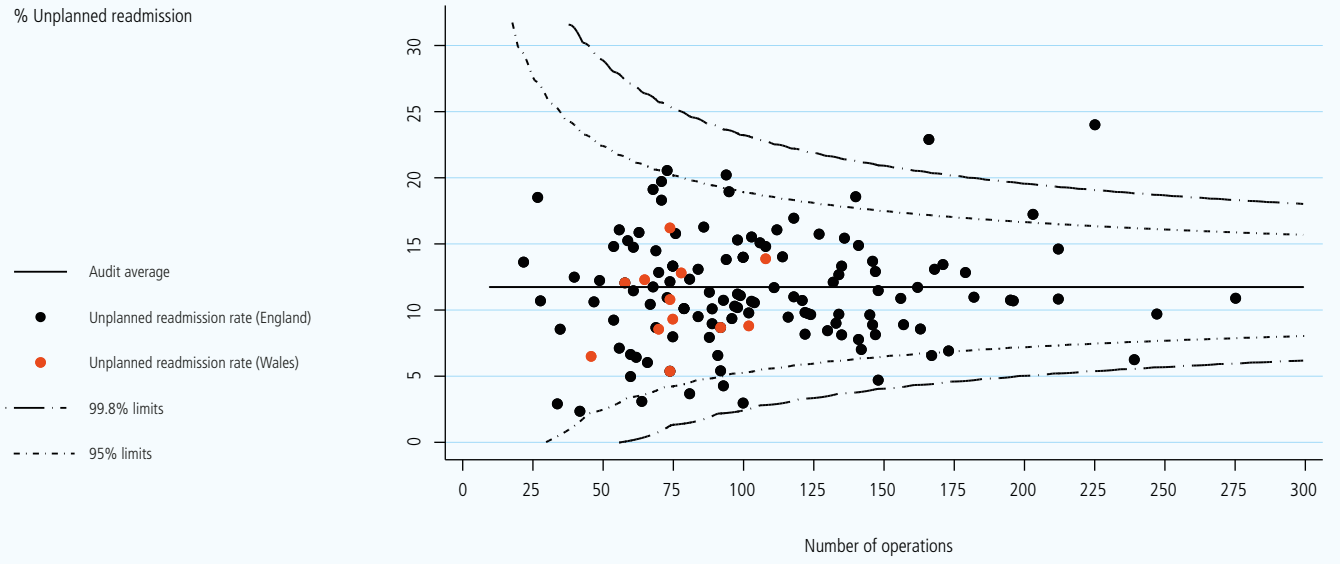
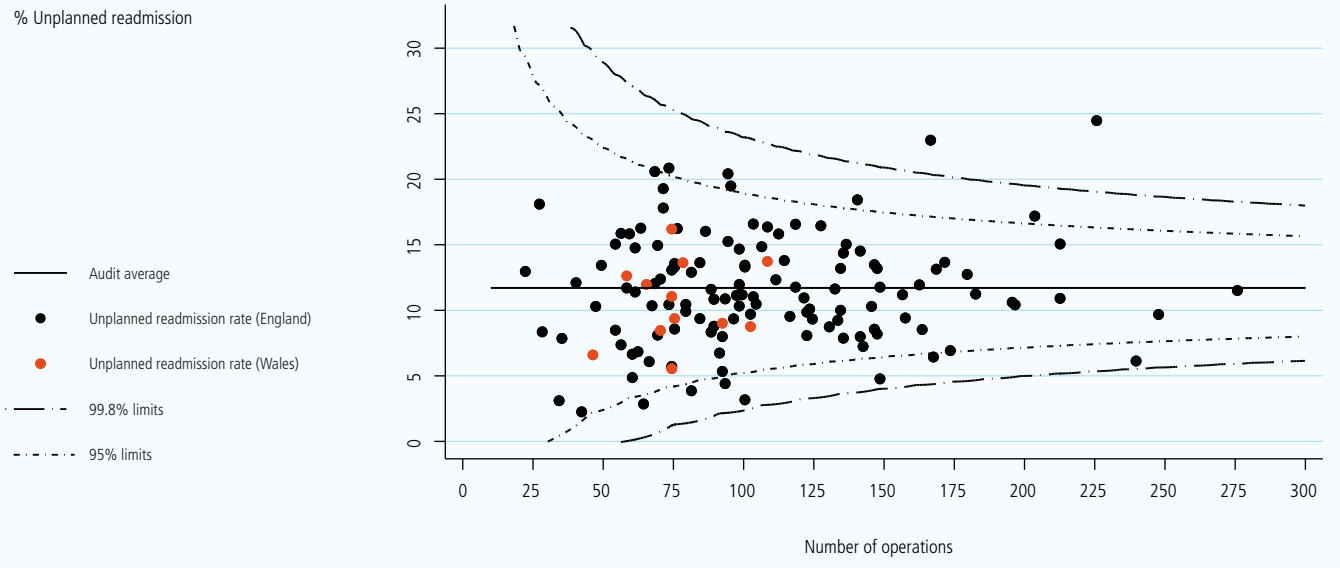


Figure 4.5
Observed and adjusted 30-day unplanned readmission rate by English NHS trust/Welsh MDT for patients diagnosed between 01 April 2018 and 31 March 2019

Observed 30-day unplanned readmission rate by trust/hospital/MDT with more than 10 operations



Adjusted 30-day unplanned readmission rate by trust/hospital/MDT with more than 10 operations



4.4 Unplanned Return to Theatre (URTT)

Unplanned return to theatre (URTT) is an important outcome measure which allows us to evaluate serious post-operative complications. Post-operative surgical complications have been shown to impact significantly upon morbidity, short- and long-term mortality, and oncological and functional outcomes, as well as placing considerable burden on healthcare resources.

This new performance indicator will enable us to better understand the frequency, determinants, cause and timing of such complications and, ultimately, the impact on subsequent outcomes such as receipt of adjuvant chemotherapy and post-operative mortality. The methods used to identify patients undergoing URTT within 30 days of their original major resection in HES-APC/PEDW are described in the methodology supplement.

This year, we are reporting both observed and adjusted results for this measure at hospital/trust/MDT level but there will be no formal outlier reporting. NBOCA welcomes feedback on its estimates of URTT prior to outlier reporting next year. Please send comments to us via this link (or e-mail: bowelcancer@nhs.net).

Trends in URTT within 30 days of surgery

Over time, URTT rates have been relatively stable with an average rate over the five audit periods of 8.2%.

Table 4.5
Rate of unplanned return to theatre within 30 days of surgery for patients linked to HES/PEDW who underwent major resection in England and Wales on or before 31st October 2019, by audit year

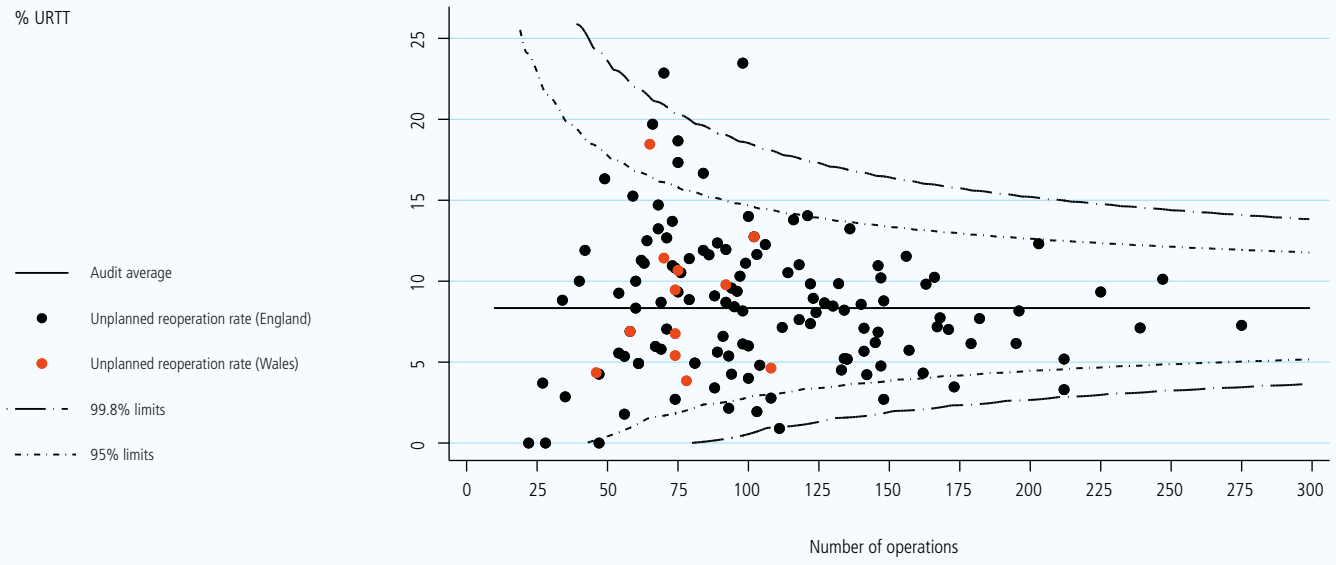
		2014–15		2015–16		2016–17		2017–18		2018–19	
		N	%	N	%	N	%	N	%	N	%
Total patients undergoing major resection		**18,978**		**18,759**		**18,705**		**18,703**		**16,111**	
Unplanned Return to Theatre within 30 days	**Yes**	1,426	8.1	1,419	8.1	1,464	8.4	1,367	7.8	1,271	8.4
	No	16,165	91.9	16,125	91.9	15,954	91.6	16,086	92.2	13,857	91.6
	Missing (% of total)	1,387	7.3	1,215	6.5	1,287	6.9	1,250	6.7	983	6.1

Geographical variation in URTT rates

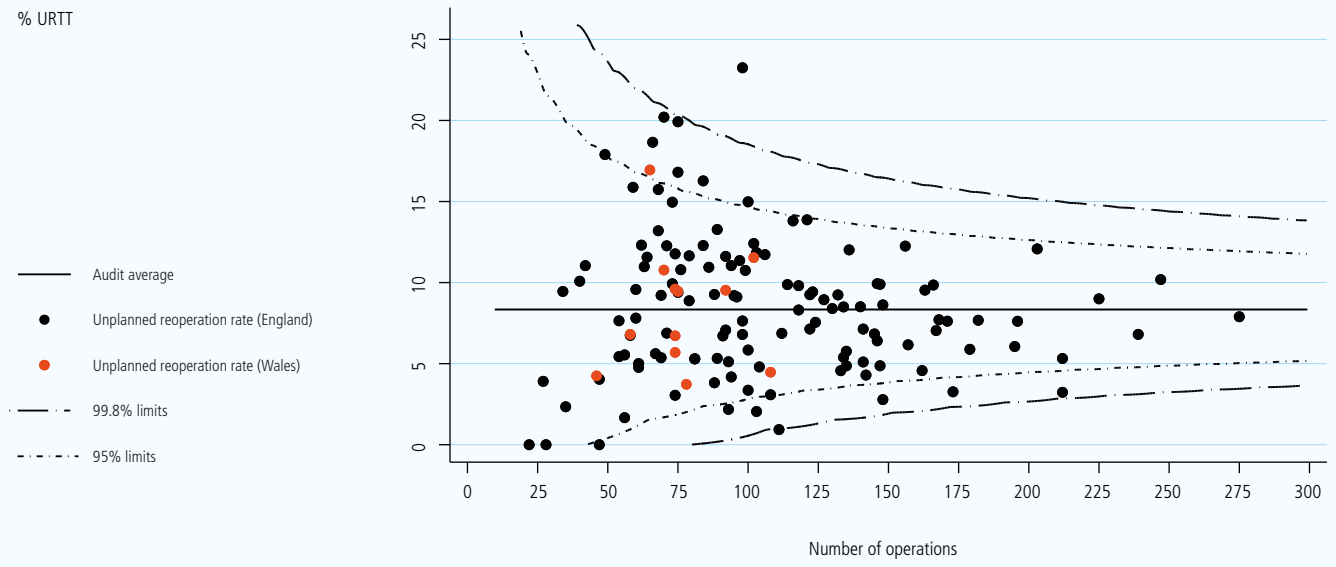
This is the first year that URTT rates have been published for individual trusts/hospitals/MDTs. There is considerable variation in URTT rates at this level (Figure 4.6). Following risk-adjustment, one trust/hospital was above the outer limit and seven further trusts/hospitals/MDTs were above the inner funnel limits.

Figure 4.6
Observed and adjusted 30-day unplanned return to theatre (elective and emergency admissions) by trust/hospital/MDT with more than ten operations for patients diagnosed between 01 April 2018 and 31 March 2019

Observed 30-day URTT by trust/hospital/MDT with more than 10 operations



Adjusted 30-day URTT by trust/hospital/MDT with more than 10 operations



4.5 What proportion of patients have laparoscopic surgery?

Surgical access is currently divided into three categories. In this year's audit period, 28% of patients underwent open resection, 8% underwent laparoscopic converted to open resection, and 64% underwent laparoscopic completed resection.

Trends over time in the use of laparoscopic surgery

The proportion of patients undergoing laparoscopically completed surgery increased considerably from 52% in the 2014/15 period to 64% this audit period (Figure 4.7). The proportion of patients undergoing conversion to an open procedure remained constant.

An increasing trend over time in the use of laparoscopic surgery is demonstrated in both the elective and emergency setting. Laparoscopic surgery has increased from 58% in the 2014/15 period to 70% in 2018/19 for elective cases, and from 21% to 30% for emergency cases.

Geographical variation in laparoscopic surgery

Considerable variation in the use of laparoscopic surgery across English cancer alliances and Wales remained. This variation has, however, reduced somewhat from the previous audit period. The proportion of patients who underwent laparoscopically completed surgery in this audit period varied from 45% to 80% (Figure 4.8), compared to 38% to 76% last year.

The use of laparoscopic surgery also varies widely between trusts/hospitals/MDTs (Table A.3). There were 15 trusts/hospitals/MDTs with less than 50% of major resections attempted laparoscopically compared to 19 last audit period. 46 trusts/hospitals/MDTs had more than 80% of major resections attempted laparoscopically, which is the same as the last audit period.

Figure 4.7
Surgical access, by audit year

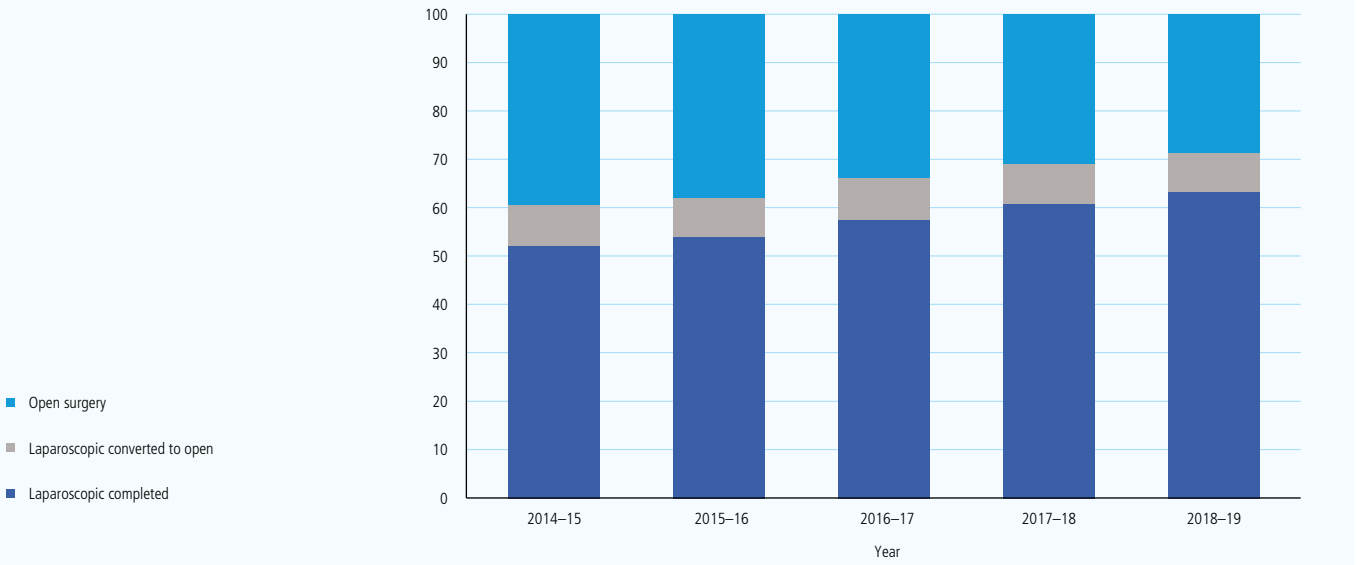
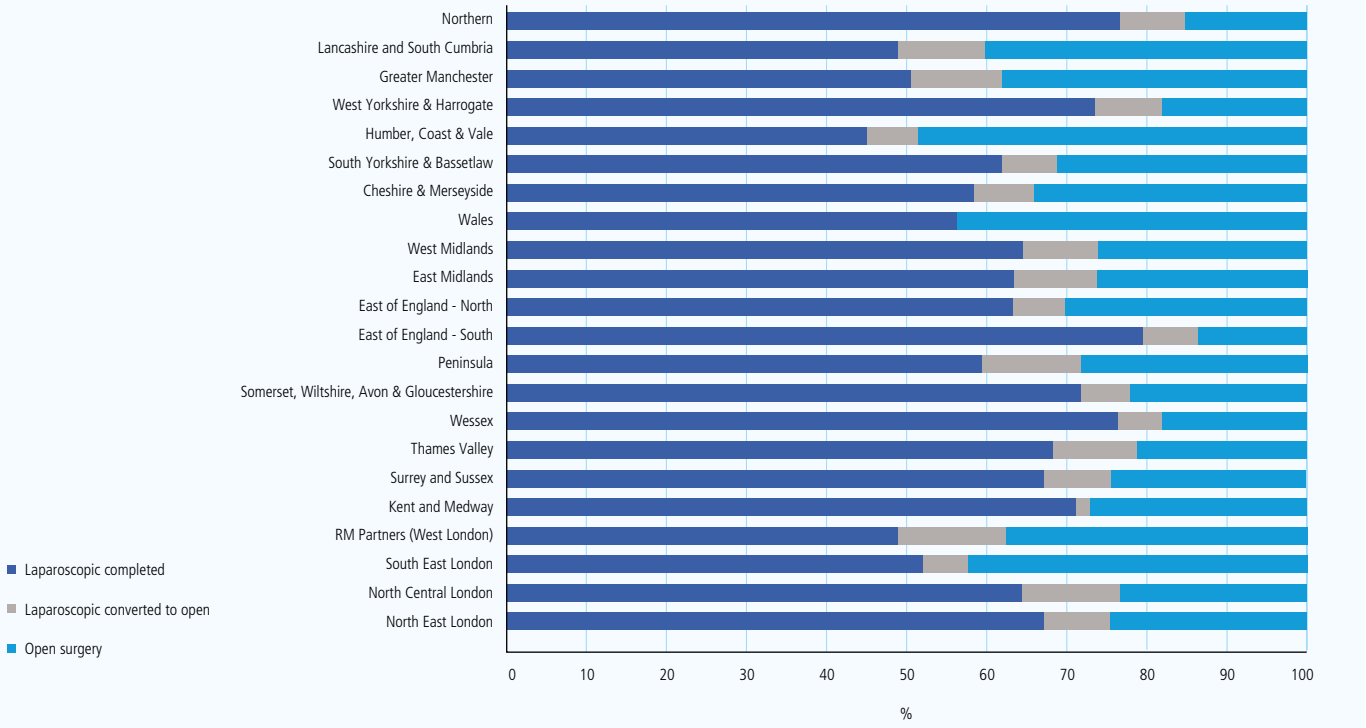


Figure 4.8
Surgical access, by cancer alliance (England)/country (Wales)



4.6 Robotic surgery

Robotic surgery for colorectal cancer is an emerging field. However, the superiority of robotic surgery over other operative techniques, particularly laparoscopic surgery, remains uncertain and there is currently no national evidence-based guidance to support its use.

Which NHS hospitals/trusts/MDTs were performing robotic surgery?

The 2019 NBOCA organisational audit collected information regarding the use of robotic surgery for colorectal cancer. 30 English NHS trusts/hospitals reported that they were regularly performing robotic colorectal cancer surgery (Table 4.6, 2019 Annual Report). MDTs in Wales were not performing any colorectal robotic surgery.

Due to the COVID-19 pandemic, the organisational survey could not be updated this year. OPCS-4 codes for robotic surgery are available in HES-APC. We used the presence of robotic surgery recorded in NBOCA and/or HES-APC for patients diagnosed between 01 April 2015 to 31 March 2019 (n=1,383) within the 30 trusts/hospitals who had previously reported regularly performing robotic colorectal surgery.

Who was performing robotic surgery?

The number of robotic cases recorded has more than doubled over the past four audit periods with 239 cases recorded in the 2015/16 period and 494 for 2018/19.

The number of surgeons recorded as performing robotic surgery also increased from 74 in the 2017/18 period to 102 this audit period. The number of robotic cases performed by the same surgeon in the 2019 annual report is compared to the cumulative number of robotic cases including this audit period as well (Figure 4.9). In the latest four year audit period, 66 individual surgeons performed a total of 10 or less robotic resections, 15 surgeons performed between 11 and 20 cases, and just 21 surgeons operated on more than 20 cases in total (average >5 robotic cases per annum).

The proportion of all cases which are being performed using robotics was explored (Figure 4.10). The annual caseload for robotic surgery per hospital/trust varies widely from 2 to 216 (median 35, interquartile range 7 to 70).

Which patients were having robotic surgery?

The median age of patients receiving robotic surgery was 68 years (IQR 59 to 74 years). Almost two thirds of robotic surgery was performed in males (63%). The majority of cases were performed for rectal or rectosigmoid cancers (64%) with the most common procedure performed being anterior resection (65%), followed by APER (13%) and right hemicolectomy (13%). Future work will continue to build on the early work presented in this report regarding robotic surgery. In particular, analyses to correlate surgical approach (laparoscopic versus robotic) with outcomes are under development.

Figure 4.9
Total volume of robotic cases recorded as being performed by each surgeon for patients diagnosed 01 April 2015 to 31 March 2018 (2019 annual report) and for patients diagnosed 01 April 2015 to March 2019 (2020 annual report)

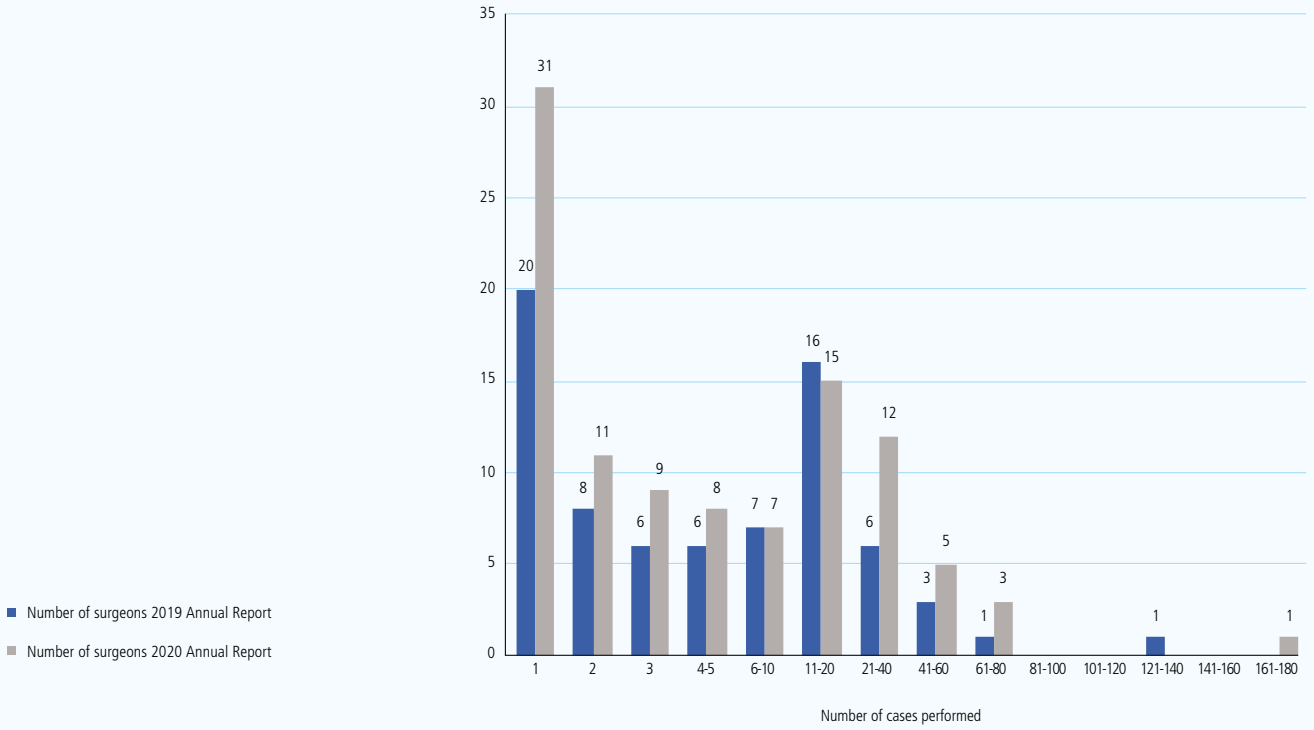
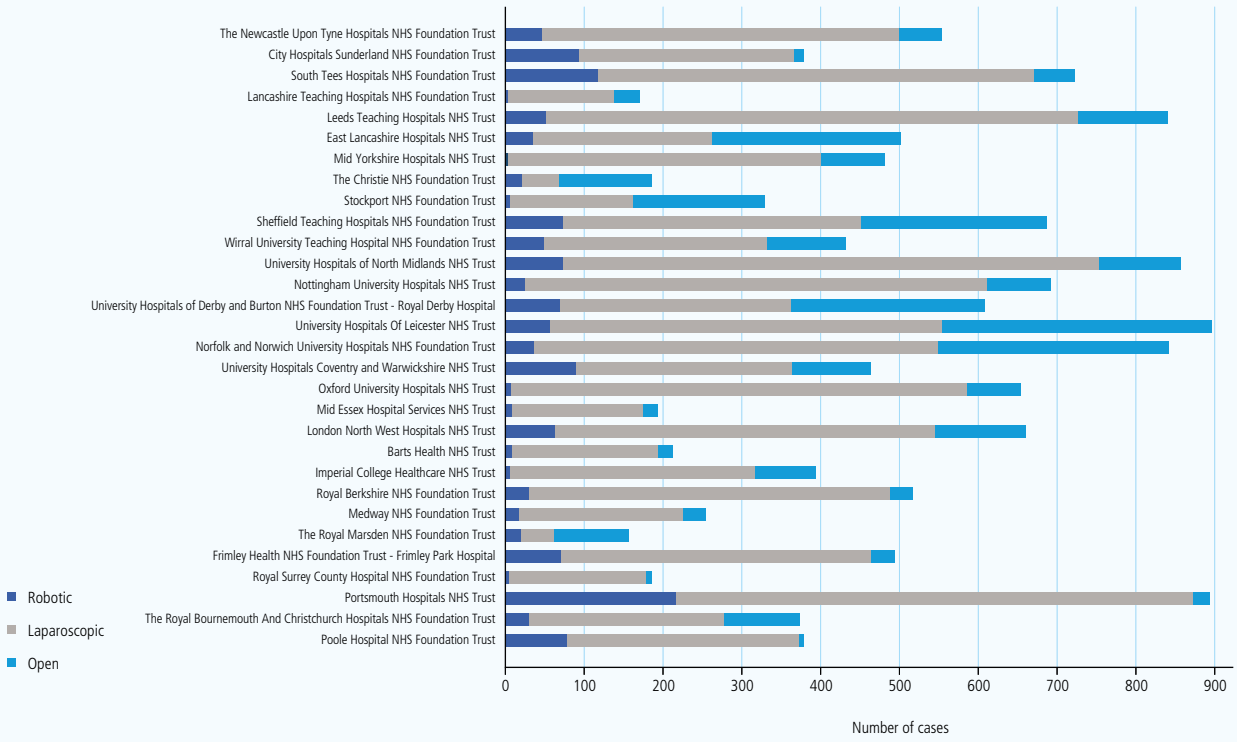
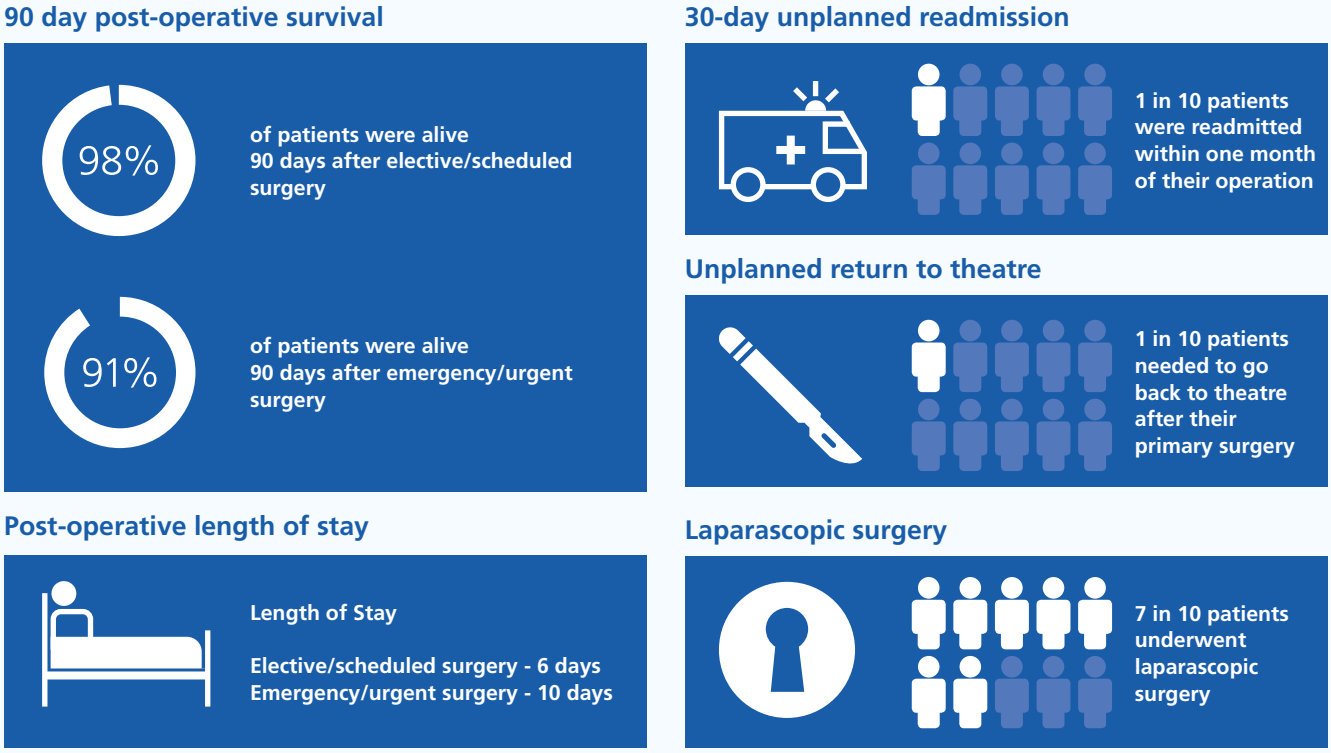


Figure 4.10
Surgical access of elective major resections on patients diagnosed between 01 April 2015 and 31 March 2019 in the 30 English NHS hospitals/trusts who reported that they regularly performed robotic colorectal cancer surgery



Infographic 2
Surgical care for bowel cancer

The diagram below summarises some of the key points from Chapter 4 regarding the surgical care of patients with bowel cancer.



Chapter Recommendations – Surgical care

- Trusts/hospitals/MDTs should review their unplanned return to theatre rates against their own data and provide NBOCA with any feedback on this new performance measure prior to outlier reporting next audit period.

- Robotic resection of colorectal cancer is now an option within the 'surgical access' dataset item, rather than having its own separate data item. Trusts/hospitals/MDTs should ensure that robotic procedures are recorded correctly using this option. NBOCA shall update the list of trusts/hospitals/MDTs performing regular robotic colorectal resections in the 2021 organisational survey.

- Trusts/hospitals/MDTs should review their data completeness for the 'mismatch repair' dataset item. Mismatch repair information should be completed for all patients within the tumour file to facilitate reporting of this measure.

Mismatch Repair Testing

Background

Current NICE guidelines recommend that all patients diagnosed with colorectal cancer should undergo genetic testing to identify those patients who may have cancer due to Lynch syndrome.

Lynch syndrome is an inherited genetic condition which accounts for approximately 3.3% of colorectal tumours in the UK. People with Lynch syndrome are also at increased risk of other cancers. Expansion of testing may increase the detection of this condition, as well as identifying families who may benefit from cascade genetic testing.

Genetic testing includes performing either immunohistochemistry for mismatch repair (MMR) proteins or microsatellite instability (MSI) testing. Tumours which are identified as having 'deficient' DNA mismatch repair require further sequential testing to confirm Lynch syndrome.

Once identified, risk-reducing strategies as per the updated British Society of Gastroenterology (BSG) guidelines, can be implemented. This includes, for example, 2-yearly colonoscopy from the age of 25 for those with MLH1 and MSH2 genes identified, and 2-yearly colonoscopy from the age of 35 for those with MSH6 and PMS2 genes identified.

Early assessment of MMR may also impact treatment strategies both in advising on the extent of surgical resection and increasing potential for immunotherapy in curative and palliative settings.

A report by Bowel Cancer UK involved a Freedom of Information (FOI) request which asked whether Clinical Commissioning Groups (CCGs) in England were funding hospitals to carry out Lynch syndrome testing. Only 6% (out of 204 CCGs) commissioned their local hospital(s) to test all bowel cancer patients in line with NICE guidance.

NBOCA data item

For the 2018/19 audit period, a data item collecting information about mismatch repair and whether the result is proficient or deficient was added to the pathology file (meaning it could only be completed for patients undergoing major resection). It has subsequently been moved to the tumour file so that it can be completed for all patients.

12.6% of all patients had a response to this item, rising to 18.2% of patients undergoing a major resection. There was some variation in response according to age, with 21.4% of those under 50 years having a response compared to 17.4% of those aged over 85 years.

Geographical variation in MMR/MSI recording

At hospital/trust level, 57% (84/147) of diagnosing trusts submitting at least 10 patients had a response to this question for any of their patients and 12% (17/147) had responses for at least 70% of their patients.

The 2019 organisational survey reported that only 58% of hospitals/trusts/MDTs were offering MMR/MSI testing to all patients. A further 36% were offering testing but only to particular age groups.

Data collection is not yet complete enough to be able to report meaningful results on MMR/MSI testing.

5. Survival

Chapter 5 – Key Findings

- Two-year all-cause mortality rates remained stable at 33% overall compared to 34% in the 2014/15 audit period, as well as stratified across different treatment modalities.
- For two-year all-cause mortality, fourteen trusts/hospitals/MDTs lay above the inner funnel limits and four of these were potential outliers above the outer limits.
- For two-year cancer-specific mortality, there were six trusts/hospitals/MDTs lying above the inner funnel limits and two of these were above the outer limits.
- There was good agreement for outlier status between all-cause and cancer-specific mortality.

5.1 Two-year all-cause mortality

For two-year all-cause mortality after major resection the observed rate is the number of patients who died within two years (of any cause) divided by the sum of the amount of time each patient is followed up. Taking into account the amount of follow-up time means that the estimate compares not just the proportion of patients who died within two years but also how quickly they died.

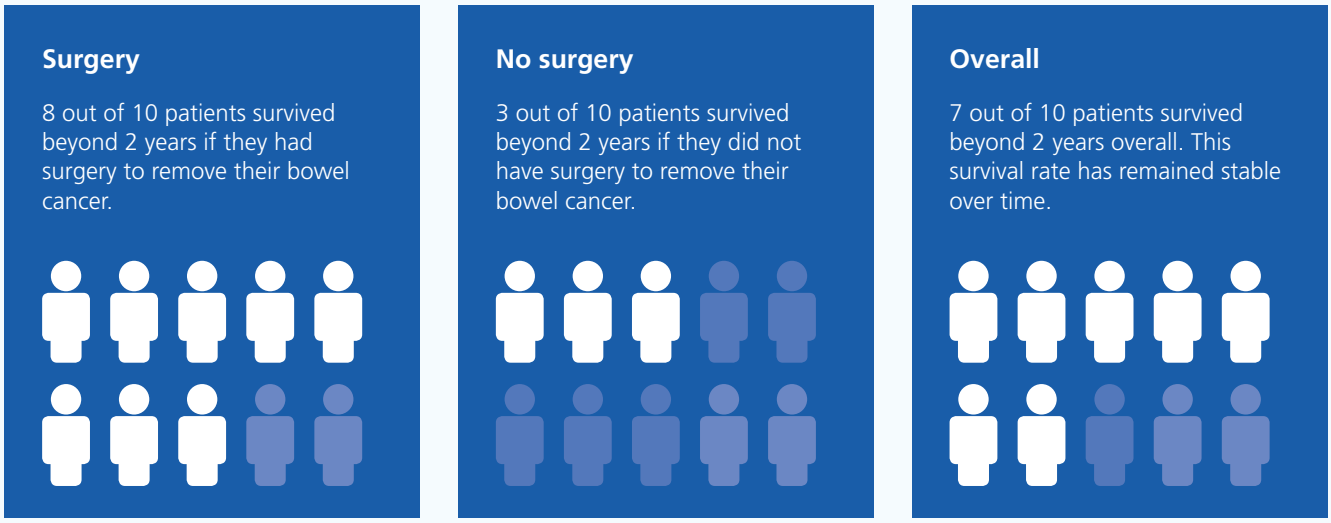
Trends in two-year overall survival over time

Although conventionally five years of follow-up is used to determine when an individual with colorectal cancer is cured, the vast majority of patients who develop recurrent disease do so within two years. For this audit period, we report on patients diagnosed between 01 April 2014 and 31 March 2017.

Two-year all-cause mortality rates remained stable. Approximately one third of all patients died within two years of diagnosis (Table 5.1). For those who did not undergo any treatment, just over two thirds died within two years of diagnosis. Mortality rates also remained stable when stratified by different treatment modalities including major resection, local excision and no treatment.

Infographic 3
What was the 2-year survival for bowel cancer?

The diagram below demonstrates the proportion of patients who survived 2 years beyond their diagnosis of bowel cancer. This is provided for all patients, as well as stratified by whether or not the patient underwent surgery to remove their bowel cancer.



Geographical variation in two-year all-cause mortality in patients undergoing major resection

Figure 5.1 demonstrates observed and adjusted two-year all-cause mortality for patients undergoing major resection for cancer alliances (England)/country (Wales). Following risk-adjustment, there was one cancer alliance just outside the outer limits. For this audit period, one cancer alliance lay above the inner funnel limits compared to four cancer alliances and Wales last audit period.

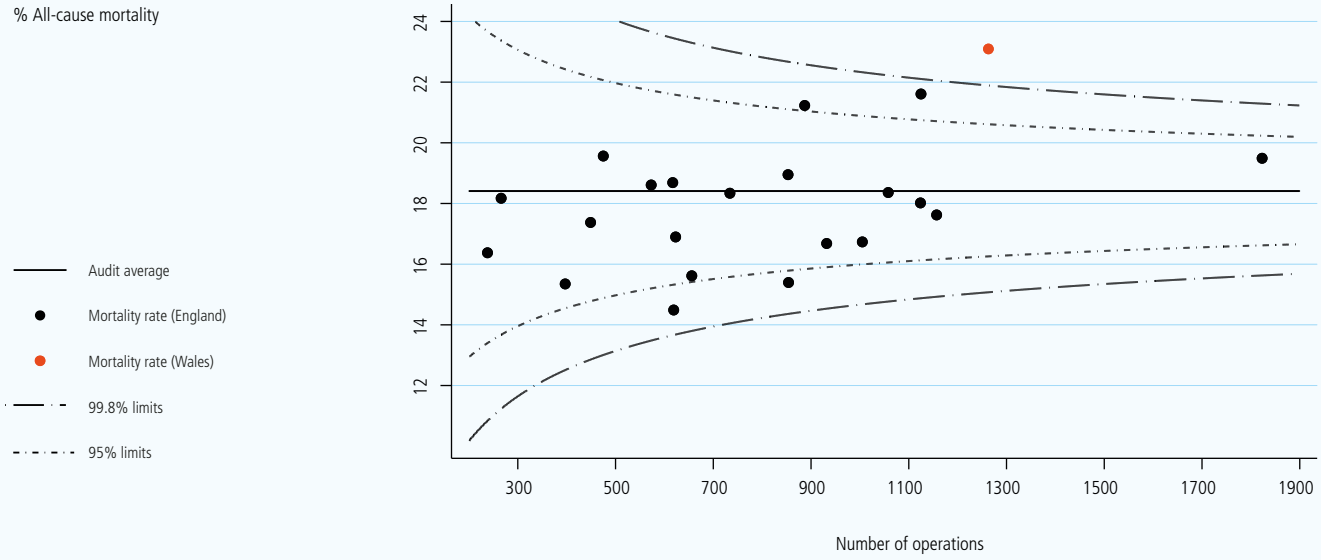
Figure 5.2 shows observed and adjusted two-year all-cause mortality for patients undergoing major resection at a trust/hospital/MDT level. Three trusts/hospitals and one MDT are potential outliers with a further ten sites lying above the inner limits. This compares favourably to seven hospitals/trusts/MDTs above the outer limits in the last audit period, although there were just four confirmed outliers following re-analysis.

Table 5.1
Two-year all-cause mortality over time for all patients diagnosed between 01 April 2014 and 31 March 2017

		2014–15		2015–16		2016–17	
		N	%	N	%	N	%
All patients		29,699		29,339		29,215	
Died within 24 months of diagnosis	**Yes**	9,953	33.6	9,685	33.1	9,506	32.7
	No	19,648	66.4	19,571	66.9	19,601	67.3
	Missing (% of total)	98	0.3	83	0.3	108	0.4
Underwent Major Resection		18,842	63.4	18,593	63.4	18,542	63.5
Died within 24 months of diagnosis	**Yes**	3,027	16.1	2,996	16.2	2,898	15.7
	No	15,748	83.9	15,550	83.8	15,578	84.3
	Missing (% of total)	67	0.2	47	0.2	66	0.2
Underwent Local Excision		1,155	3.9	1,234	4.2	1,213	4.2
Died within 24 months of diagnosis	**Yes**	111	9.6	103	8.3	107	8.8
	No	1,044	90.4	1,131	91.7	1,105	91.2
	Missing (% of total)	0	0.0	0	0.0	1	0.0
No Excision of Tumour		9,702	32.7	9,512	32.4	9,460	32.4
Died within 24 months of diagnosis	**Yes**	6,815	70.5	6,586	69.5	6,501	69.0
	No	2,856	29.5	2,890	30.5	2,918	31.0
	Missing (% of total)	31	0.1	36	0.1	41	0.1

Figure 5.1
Observed and adjusted two-year all-cause mortality rate for patients who underwent a major surgical resection between 01 April 2016 and 31 March 2017, by cancer alliance (England)/country (Wales), including hospital/trust/MDTs with more than ten operations

Observed 2-year all-cause mortality rate by cancer alliance (England)/country (Wales)



Adjusted 2-year all-cause mortality rate by cancer alliance (England)/country (Wales)

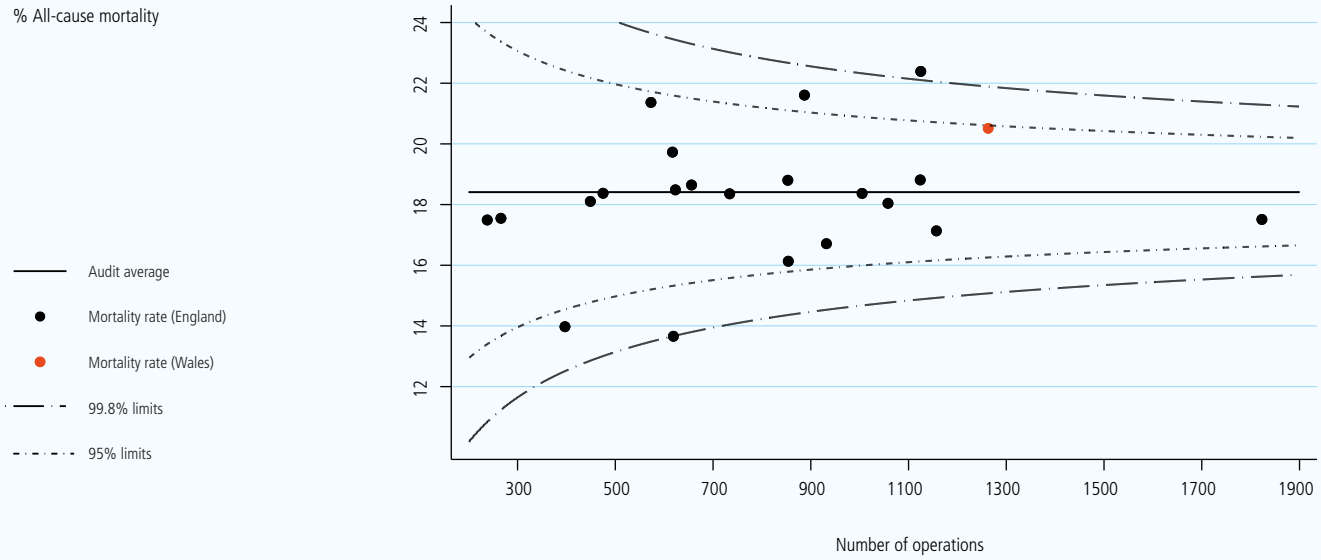
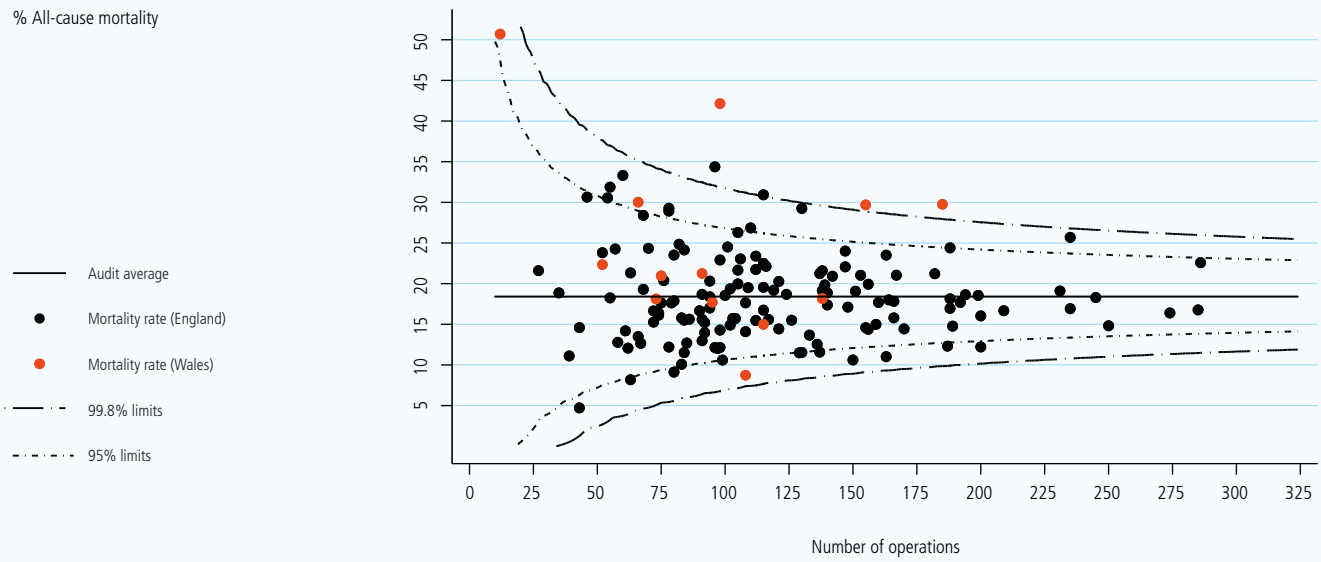
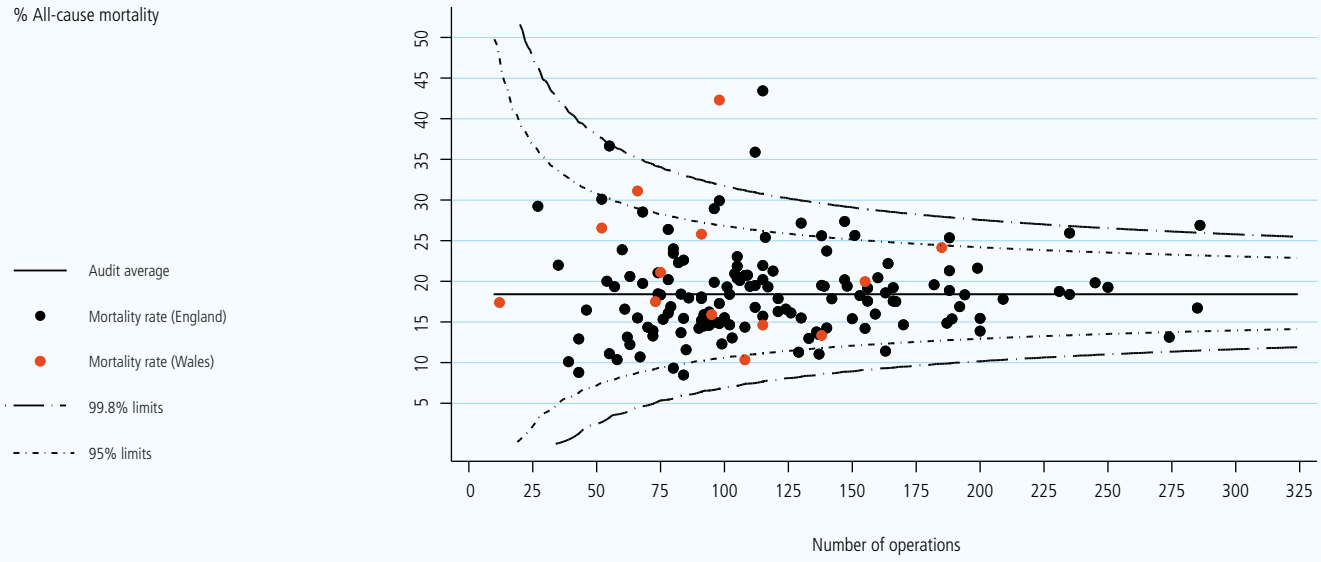


Figure 5.2
Observed and adjusted two-year all-cause mortality rate for patients who underwent a major resection between 01 April 2016 and 31 March 2017, by hospital/trust/MDTs with more than ten operations

Observed 2-year all-cause mortality rate by hospital/trust/MDT with more than ten operations



Adjusted 2-year all-cause mortality rate by hospital/trust/MDT with more than ten operations



5.2 Two-year cancer-specific mortality

In the 2019 annual report, development work was carried out on the reporting of two-year cancer-specific mortality. This involved the use of competing risk models to allow separate risk-adjustment of deaths from cancer and non-cancer causes. Along with findings from a previous short report published in 2017, this work supported the use of risk-adjusted cancer-specific two-year mortality as a performance indicator. Further information on this can be found in the methodology supplement.

All-cause mortality includes deaths from causes other than the cancer itself or treatment for the cancer, and these will often be beyond the control of the healthcare provider. Comparing cancer-specific mortality between trusts/hospitals/MDTs offers the potential to make fairer comparisons of long-term mortality. This year, we are reporting trust/hospital/MDT cancer-specific two-year mortality alongside all-cause mortality for the first time, but only all-cause two-year mortality will continue to be outlier reported at present.

Geographical variation in two-year cancer-specific mortality in patients who underwent major resection

Figure 5.3 demonstrates observed and adjusted two-year cancer-specific mortality for patients undergoing major resection by trust/hospital/MDT. One trust/hospital and one MDT were above the outlier limit for this measure. Both sites were potential outliers for all-cause mortality. There were an additional three trusts/hospitals and one Welsh MDT lying above the inner funnel limits. There was much less variation between sites than for all-cause mortality and there were no more sites outside the inner limits than would be expected by chance.

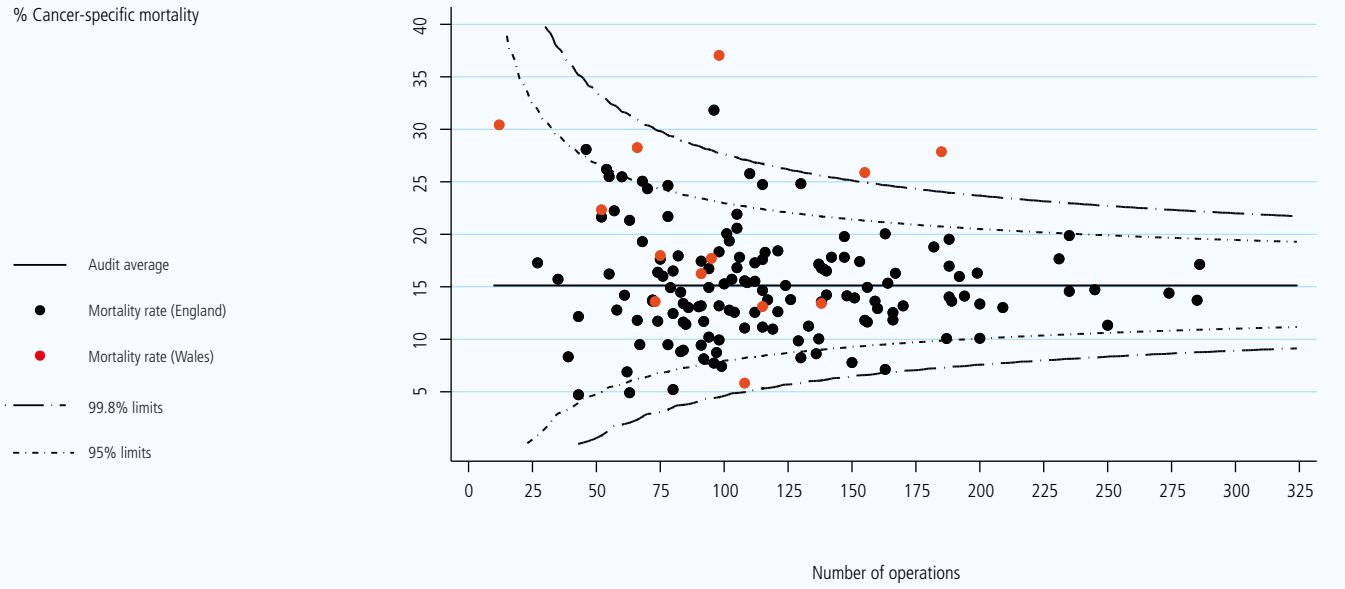
One trust/hospital moved from being a potential outlier for all-cause mortality to being above the inner funnel limits for cancer-specific mortality. All other trusts/hospitals/MDTs that were above the inner funnel limits for cancer-specific mortality were also above the inner funnel limits for all-cause mortality. However, there was less variation for cancer-specific mortality, with six trusts/hospitals/MDTs above the inner funnel limits compared to fourteen with all-cause mortality.

Chapter Recommendations – Survival

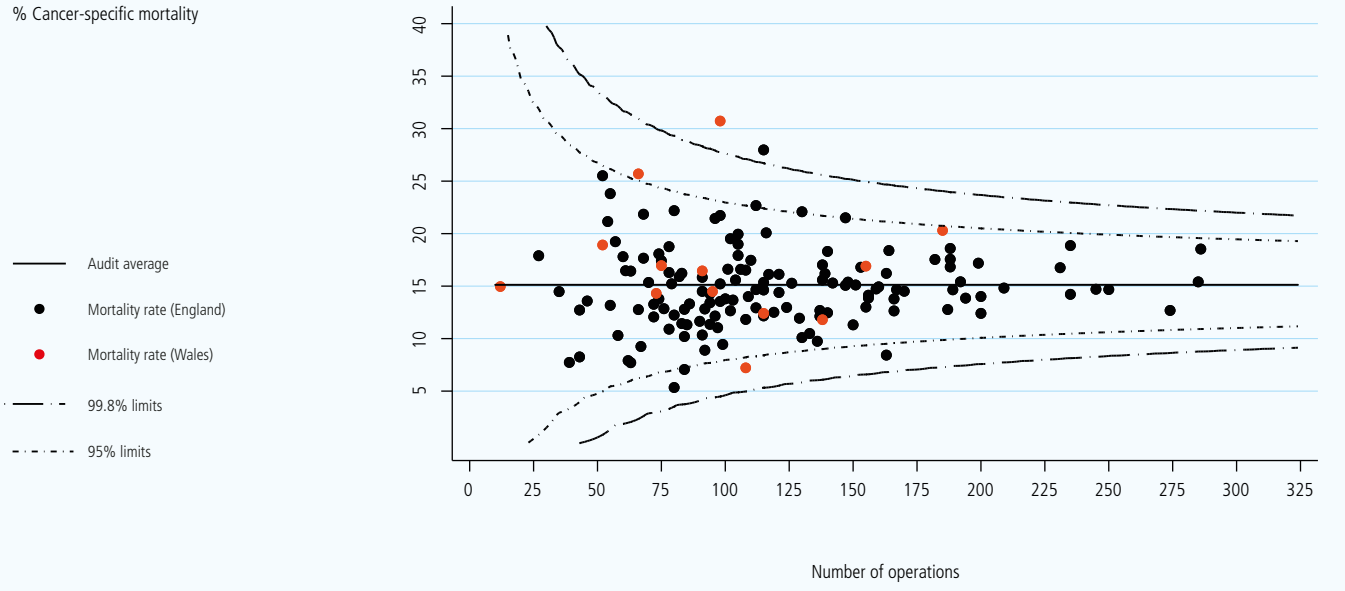
- NBOCA should consider whether to use cancer-specific mortality instead of/in addition to all-cause mortality to make fairer comparisons of long-term mortality in the future.
- Ongoing action is required nationally to reduce risk exposures, support healthy behaviours and mitigate the effects of socioeconomic deprivation in order to reduce regional variation in cancer survival.

Figure 5.3
Observed and adjusted cancer-specific two-year mortality rate for patients who underwent a major resection between 01 April 2016 and 31 March 2017, by trusts/hospitals/MDTs with more than ten patients

Observed 2-year cancer-specific mortality rate by hospital/trust/MDT with more than ten operations



Adjusted 2-year cancer-specific mortality rate by hospital/trust/MDT with more than ten operations



6. Rectal cancer

Chapter 6 – Key Findings

- Just under half of patients with rectal cancer underwent major resection, 7% had local excisional procedures, 7% non-resectional surgery, and the remainder did not have any surgical intervention.
- Overall, one third of rectal cancer patients received neo-adjuvant treatment, although large differences in the use and choice of neo-adjuvant radiotherapy was observed at regional level. Use of neo-adjuvant therapy varied according to region from 18% to 61%.
- For those patients receiving neo-adjuvant therapy, the proportion at trust/hospital/MDT level who had long-course chemoradiotherapy varied from 53% to 95%, and the proportion of patients who had short-course radiotherapy varied from 0% to 36%.
- 92% of patients undergoing rectal resection had negative circumferential resection margins.
- 35% of rectal cancer resections were abdominoperineal resections (APERs) or Hartmann's procedures, which lead to a permanent stoma, and just under 30% of patients undergoing anterior resection had an unclosed diverting ileostomy at 18 months with wide variation at trust/hospital/MDT level (5% to 65%).
- From next year, NBOCA will report on 18-month unclosed diverting ileostomy rate and permanent stoma procedure rates to inform quality improvement by separating out factors influencing stoma rates.
- The annual median volume of rectal resections at trust/hospital/MDT level was 25 (IQR 19-36), with 5% of sites not performing above this threshold, and at surgeon level was 5 (IQR 3-7).

6.1 How were patients with rectal cancer treated?

Trends over time

During this audit period, 8,454 patients were diagnosed with rectal cancer. There continues to be a reduction in the proportion of patients undergoing major resection each year coupled with an increase in the proportion having no surgery. During this audit period, 46% of rectal cancer patients were recorded as undergoing major resection, 7% as having local excisional procedures (e.g. transanal endoscopic microsurgery), 7% with non-resectional surgery (e.g. stoma formation) and the remainder (40%) with no surgery (Table 6.1).

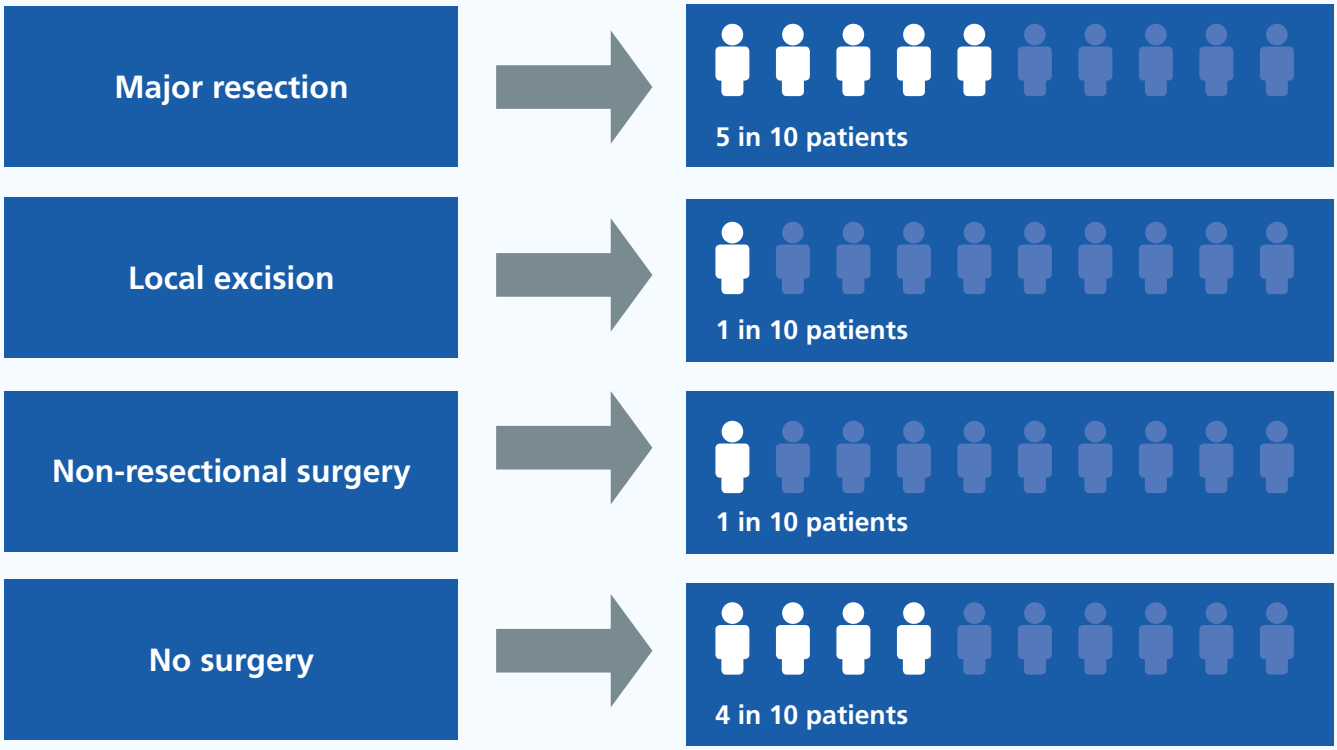
Compared with previous years there is a 6 to 8% absolute reduction in rectal cancer patients recorded as undergoing a major resection. It is possible that this difference is attributable to reduced data submission, largely because of the impact of COVID-19 on resource prioritisation and also as a consequence of the National data opt-out (Section 2.2). An increase in 'watchful waiting' for patients with a complete clinical response to neo-adjuvant chemoradiotherapy based on clinical, endoscopic and radiological criteria and trials assessing organ preservation techniques may have also contributed to this change, although it is unlikely that these trends account for all of the difference observed.

Table 6.1
Management of rectal cancer patients reported to NBOCA, by audit year

	2014–15		2015–16		2016–17		2017–18		2018–19	
	N	%	N	%	N	%	N	%	N	%
Total rectal cancer patients	**8,864**		**8,364**		**8,308**		**8,608**		**8,454**	
Major resection	4,846	54.7	4,479	53.6	4,487	54.0	4,488	52.1	3,899	46.1
Local excision	591	6.7	595	7.1	607	7.3	625	7.3	586	6.9
Non-resectional surgery	677	7.6	617	7.4	594	7.1	603	7.0	610	7.2
No surgery	2,750	31.0	2,673	32.0	2,620	31.5	2,892	33.6	3,359	39.7

Infographic 4
How were patients with rectal cancer treated?

The diagram below shows the proportion of patients with rectal cancer that received different treatments.*



*Due to rounding to whole numbers, these numbers do not add up to 10

Use of Radiotherapy

Of the 3,816 patients diagnosed between 01 January 2018 and 31 December 2018 who underwent a major resection, 1,287 (34%) received neo-adjuvant treatment (Table 6.2). This proportion reduced slightly from 36% in the previous reporting period.

Of these 1,287 patients, 74% received long-course chemoradiotherapy, 20% short-course radiotherapy and 6% unclassified regimens. The proportion of patients receiving each type of radiotherapy remains stable, although a smaller proportion of patients fell in to the unclassified category.

Patients who received radiotherapy were generally younger with more advanced pre-treatment T- and N-stage disease. Patients with tumours <5cm from the anal verge were more likely to receive radiotherapy and this was more likely to be long-course. Patients receiving short-course radiotherapy were generally older and more co-morbid, with less-advanced pre-treatment T- and N-stage disease than those receiving long-course radiotherapy.

Table 6.2
Patient characteristics by treatment type, for 3,816 rectal cancer patients diagnosed between 01 January 2017 and 31 December 2017 who underwent a major resection

		No pre-op treatment recorded		Long-course RT pre-surgery		Short-course RT pre-surgery		Other treatment pre-surgery *	
		N	%	N	%	N	%	N	%
Total rectal cancer patients		**2,529**		**953**		**253**		**81**	
Sex	**Male**	1,642	64.9	613	64.3	185	73.1	54	66.7
	Female	887	35.1	340	35.7	68	26.9	27	33.3
Age-group	**<50 yrs**	165	6.5	117	12.3	23	9.1	18	22.2
	50-59 yrs	403	15.9	223	23.4	45	17.8	20	24.7
	60-74 yrs	1,263	49.9	484	50.8	116	45.8	35	43.2
	75-84 yrs	597	23.6	122	12.8	64	25.3	8	9.9
	85+ yrs	101	4.0	7	0.7	5	2.0	0	0.0
Pre-treatment TNM T-stage	**T1**	142	5.6	9	0.9	3	1.2	2	2.5
	T2	854	33.8	87	9.1	46	18.2	9	11.1
	T3	1,234	48.8	647	67.9	182	71.9	45	55.6
	T4	143	5.7	188	19.7	19	7.5	23	28.4
	TX/ T9	156	6.2	22	2.3	3	1.2	2	2.5
Pre-treatment TNM N-stage	**N0**	1,485	58.7	184	19.3	89	35.2	20	24.7
	N1	703	27.8	419	44.0	117	46.2	32	39.5
	N2	185	7.3	328	34.4	42	16.6	27	33.3
	Nx/ N9	155	6.2	22	2.3	5	2.0	2	2.5
Pre-treatment TNM M-stage	**M0**	2,363	93.4	859	90.1	222	87.7	43	53.1
	M1	86	3.4	74	7.8	28	11.1	38	46.9
	Mx/ M9	80	3.2	20	2.1	3	1.2	0	0.0
Surgical Procedure	**Anterior Resection**	1,753	69.3	413	43.3	129	51.0	45	55.6
	APER/Pelvic Exenteration	403	15.9	443	46.5	85	33.6	26	32.1
	Hartmann's	269	10.6	74	7.8	32	12.6	8	9.9
	Other	104	4.1	23	2.4	7	2.8	2	2.5
Mode of admission (from HES)	**Elective**	2,281	96.5	887	96.4	239	98.0	71	92.2
	Emergency	83	3.5	33	3.6	5	2.0	6	7.8
	Missing (% of total)	165	6.5	33	3.5	9	3.6	4	4.9
Comorbidities (from HES)	**0**	1,335	56.4	552	60.0	133	54.5	40	51.9
	1	678	28.7	260	28.3	75	30.7	28	36.4
	2+	353	14.9	108	11.7	36	14.8	9	11.7
	Missing (% of total)	163	6.4	33	3.5	9	3.6	4	4.9
Tumour height from anal verge (cm)	**0-5**	477	27.3	308	45.9	62	33.5	14	28.0
	6-10	784	44.8	264	39.3	86	46.5	23	46.0
	11-15	452	25.8	98	14.6	36	19.5	13	26.0
	16-20	37	2.1	1	0.1	1	0.5	0	0.0
	Missing	779	30.8	282	29.6	68	26.9	31	38.3
Grade (differentiation)	**G1 Well**	117	5.5	43	6.0	16	7.5	6	9.1
	G2 Moderate	1,871	87.6	614	85.6	179	84.4	54	81.8
	G3/G4 Poor/Undifferentiated/ anaplastic	148	6.9	60	8.4	17	8.0	6	9.1
	Missing	393	15.5	236	24.8	41	16.2	15	18.5
Vascular/ Lymphatic Invasion	**None**	1,118	56.4	451	62.7	107	52.7	27	37.5
	Vascular +/- Lymphatic	695	35.1	216	30.1	75	36.9	38	52.7
	Uncertain/Not assessed/NK	171	8.6	52	7.2	21	10.4	7	9.8
	Missing	545	21.6	234	24.6	50	19.8	9	11.1

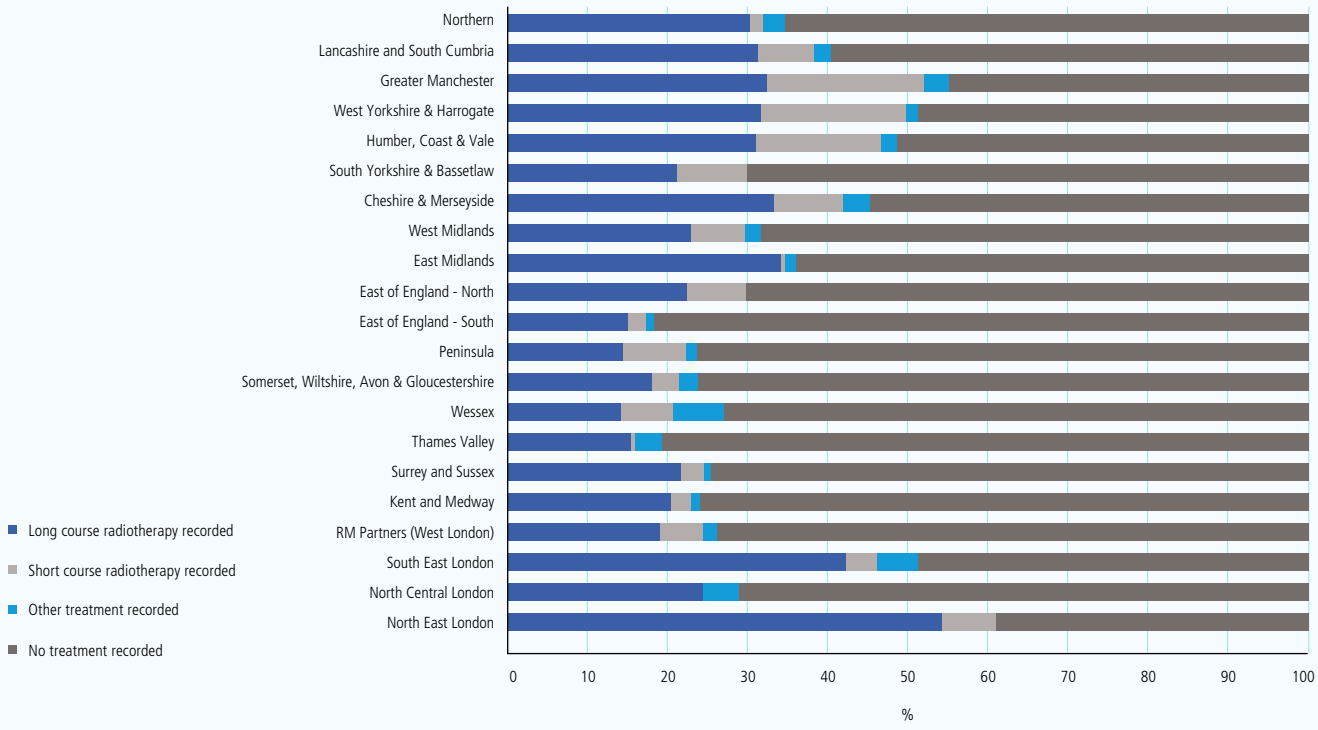
* Chemotherapy, brachytherapy or radiotherapy that cannot be classified into our definitions of long/short-course

Geographical variation in the use of neo-adjuvant radiotherapy

Currently, RTDS data is available for England only. Radiotherapy data for Wales is usually captured via an audit dataset item, however, this was incomplete in this audit period.

This audit period, considerable variation in the use of neo-adjuvant treatments for rectal cancer persists across English cancer alliances (Figure 6.1). Overall, use of neo-adjuvant treatment varies from 18% to 61%. There is significant variation in the use of long-course and short-course radiotherapy as neo-adjuvant strategies. Of those recorded as receiving neo-adjuvant therapy, the use of long-course chemoradiotherapy varies from 53% to 95% and short-course radiotherapy varies from 0% to 36%.

Figure 6.1
Treatment pathways for rectal cancer patients diagnosed between 01 January 2018 and 31 December 2018 who underwent major resection, by cancer alliance (England)* performing surgery



* Incomplete preoperative treatment in audit dataset for Wales therefore unable to include Welsh data this audit period

6.2 How many patients having rectal cancer surgery have a negative circumferential resection margin?

A negative circumferential resection margin (CRM) is defined as the edge of the tumour being greater than 1mm from the CRM. This means that the margin is not involved according to the histopathologist. The proportion of patients with negative CRM status remained stable, although data quality had decreased a little in this audit period with 13.7% missing data compared to 10.3% in 2017/18 (Table 6.3).

Table 6.3
Resection margin status for those with rectal cancer undergoing major resection, by audit year

		2014–15		2015–16		2016–17		2017–18		2018–19	
		N	%	N	%	N	%	N	%	N	%
Total No. Patients		4,846		4,479		4,487		4,488		3,899	
Recorded Margin Status	**Negative**	3,280	90.8	3,089	90.0	3,446	91.7	3,607	89.6	3,089	91.8
	Positive	332	9.2	343	10.0	310	8.3	420	10.4	275	8.2
	Missing	1,234	25.5	1,047	23.4	731	16.3	461	10.3	535	13.7

6.3 How were stomas used in rectal cancer surgery and how often were 'temporary' stomas reversed?

18-month stoma rate for all rectal major resections has been reported by NBOCA since the 2013 annual report. Since the 2014 annual report, 18-month stoma rates have been reported using pooled results over three years in order to obtain a sample size large enough to provide meaningful results by trust/hospital/MDT. Over the seven years of reporting, the national average rate of 18-month stoma rate has remained stable at just over 50%. Details of how stoma rate is calculated can be found in the methodology supplement.

Trends over time in stoma rate

The 18-month stoma rate reflects a combination of decisions about the surgical procedure and the proportion of temporary stomas which are reversed. As part of an APER procedure, patients receive a permanent stoma. An elective Hartmann's procedure for sigmoid or rectal cancer results in a permanent stoma in almost all cases. For the majority of patients undergoing anterior resection, patients have a temporary ileostomy to defunction the anastomosis in case of anastomotic leak, but not all of these ileostomies are reversed, with the commonest reasons for non-closure being anastomotic leak and progressive disease. Between 2014 and 2018 there was a slight decrease in the proportion of rectal cancer patients undergoing anterior resection and a corresponding increase in those undergoing an APER (Table 6.4).

A procedure leading to a permanent stoma may be the best option for the patient due to tumour staging and location, or often due to potential for poor functional outcome with anastomosis. Across the country there was wide variation in the proportion of patients who received a permanent stoma at surgery (7% to 83%). Some centres are specialists in treating more advanced rectal tumours and perform complex exenterative surgery; others may treat populations who are more likely to present with later stage tumours or for whom a permanent stoma is a better option in terms of long-term quality of life or high perioperative risk.

Table 6.4
Major Resection procedure performed, by year of surgery

	2014–5		2015–16		2016–17		2017–18	
Total	**3,597**		**4,361**		**4,223**		**4,292**	
Anterior Resection	2,299	63.9	2,742	62.9	2,615	61.9	2,632	61.3
APER	851	23.7	1,118	25.6	1,108	26.2	1,149	26.8
Hartmann's	357	9.9	381	8.7	394	9.3	428	10.0
Other	90	2.5	120	2.8	106	2.5	83	1.9

The proportion of patients receiving a stoma at the time of their anterior resection has increased (Table 6.5). Balancing the decision to divert a low anastomosis with a protective ileostomy against the potential negative consequences for the patient in terms of readmission with a high output stoma, reduced tolerance to any adjuvant chemotherapy recommended, and ultimately reduced long-term renal function, and survival remains a key judgement for colorectal surgeons.

The proportion of patients whose ileostomy is unclosed at 18 months has remained at 28 to 30% over the last 3 audit periods, rising from 24% in 2014–15 (Table 6.5).

Table 6.5
Stoma status at time of surgery and 18 months post-surgery in patients undergoing an Anterior Resection, by year of surgery

		2014–15		2015–16		2016–17		2017–18	
		N	%	N	%	N	%	N	%
Total		2,299		2,742		2,615		2,632	
Stoma status at surgery	**No stoma**	563	24.5	603	22.0	534	20.4	570	21.7
	Colostomy	282	12.3	364	13.3	381	14.6	380	14.4
	Ileostomy	1,454	63.2	1,775	64.7	1,700	65.0	1,682	63.9
	Ileostomy at 18 months in those with Ileostomy at surgery	347	23.9	532	30.0	477	28.1	479	28.5

Understanding the variation in 18-month stoma rate

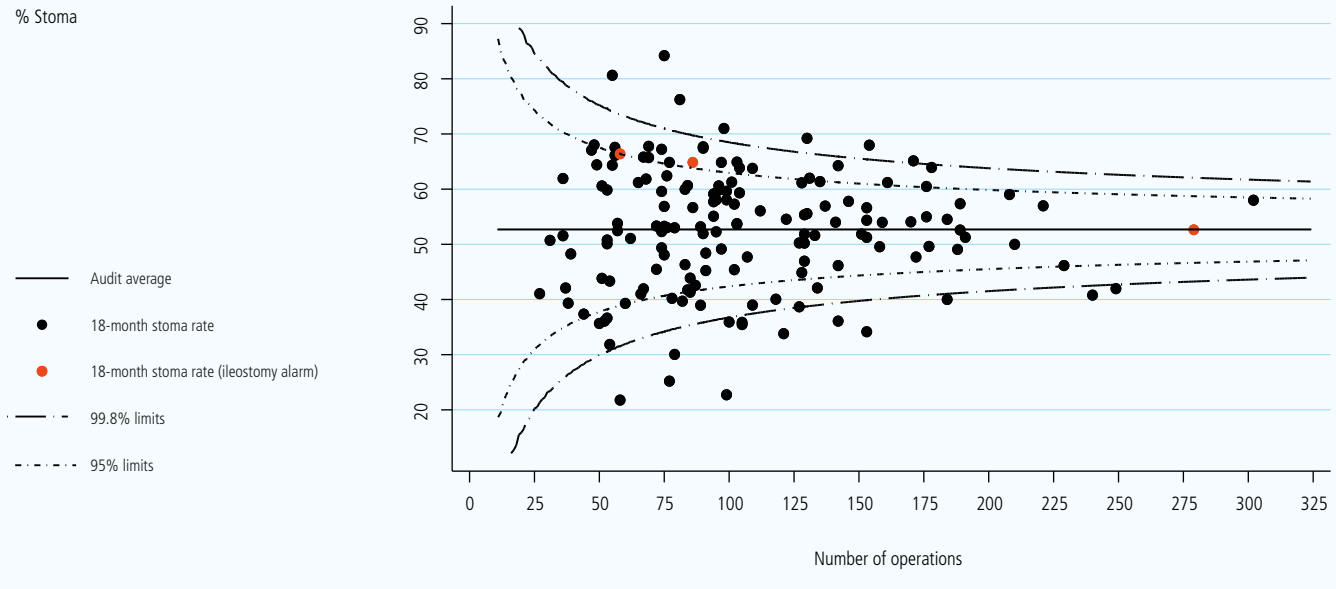
In Figure 6.2, a large amount of variability in adjusted 18-month stoma rate for all rectal major resections is shown, with seven hospitals/trusts/MDTs whose 18-month stoma rate is above the alarm limit and who would trigger the outlier process.

Overall, 35% of rectal cancer resections between April 2014 and March 2018 were APERs or Hartmann's procedures, which lead to a permanent stoma. This rate varies widely between hospitals/trusts/MDTs (Table A.5).

For the seven trusts above the outer limits on 18-month stoma rate, this proportion varied from 42% to 83%; and in four of the seven the proportion was higher than the overall national rate.

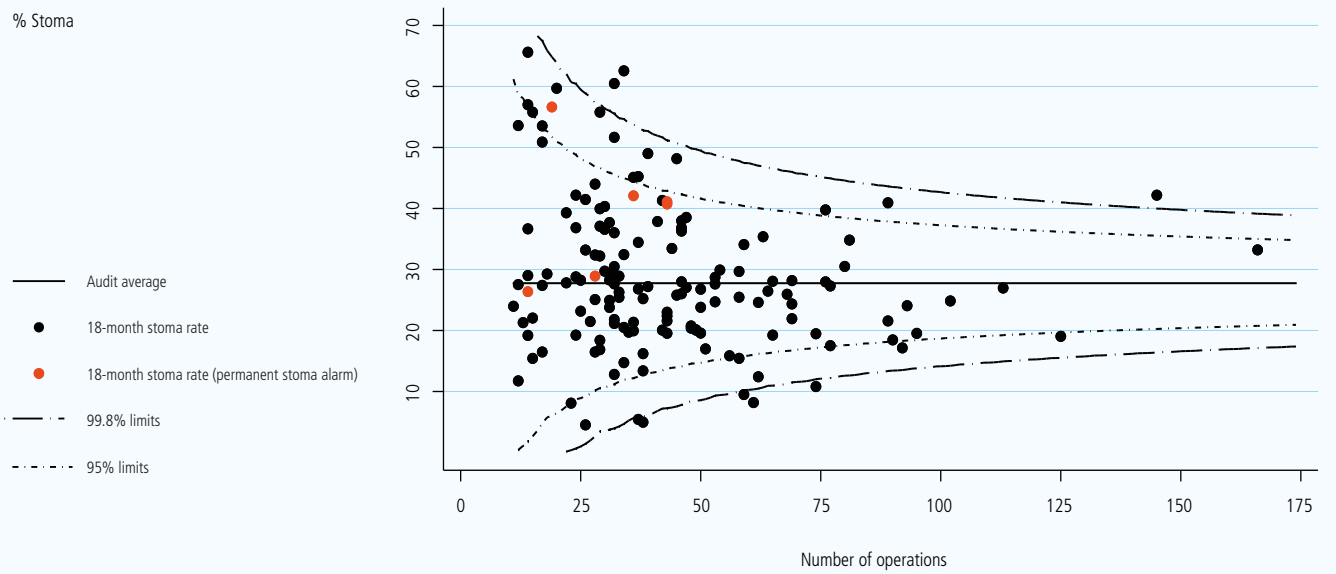
When restricted to anterior resections with ileostomy formation (Figure 6.3), there was less overall variation in 18-month unclosed diverting ileostomy rate with fewer trusts/hospitals/MDTs above the alarm level. However, although the average proportion of patients with an unclosed diverting ileostomy at 18 months was just under 30%, there was very wide variation in the proportion at hospital/trust/MDT level (5% to 65%).

Figure 6.2
Risk-adjusted 18-month stoma rate for rectal major resections performed at hospital/trust/MDT level between 01 April 2014 and 31 March 2018, by year of surgery



Five out of six of the trusts/hospitals/MDTs with 18-month stoma rates above the outer limits in Figure 6.2 had unclosed diverting ileostomy rates above the national average (red dots in Figure 6.3). The seventh trust/hospital/MDT was excluded from the unclosed diverting ileostomy rate analysis as they performed too few anterior resections with ileostomy. Three trusts were above alarm level on unclosed diverting ileostomy rate (Figure 6.3). Two of these were on or just above the 95% limit for the 18-month stoma rate in all rectal cancer resections (red dots in Figure 6.2) but none would have triggered the outlier process for this measure.

Figure 6.3
Risk-adjusted 18-month unclosed diverting ileostomy rate for anterior resections performed at hospital/trust/MDT level between 01 April 2014 and 31 March 2018, by year of surgery



To conclude, 18-month stoma rates have not improved over time with persistently high numbers of outliers. There has been an increase in the proportion of patients undergoing anterior resection with diverting ileostomy and the rate of unclosed ileostomies at 18 months is high (30% overall). There is wide variation between trusts/hospitals/MDTs in both 18-month unclosed diverting ileostomy rates and the proportion of resections where a permanent stoma is created. Not all trusts above the outer limits on these individual measures would trigger the outlier process for 18-month stoma rate.

What now?

As part of the NBOCA Quality Improvement Plan, from the 2021 annual report, 18-month stoma rate across all rectal resections will no longer be reported. Instead, separate outlier reporting will be carried out for 18-month unclosed diverting ileostomy rate in patients undergoing anterior resection, and for the proportion of rectal cancer resections where a permanent stoma is created (APER and Hartmann's procedures). These outcomes will be determined using the most recent 5 years of pooled data.

It is hoped that the reporting of these two new performance indicators will stimulate quality improvement by separating out the factors influencing stoma rates. This should provide trusts/hospitals/MDTs with a better understanding of target areas for quality improvement.

As the current 18-month stoma performance indicator is to be replaced, individual results will not be published in the supporting appendix of this annual report and there will be no outlier reporting this audit period. Instead, the two new outcomes described above are reported at hospital/trust/MDT level in preparation for outlier reporting from 2021. Due to data limitations, only four years of data are available for use this year. NBOCA welcomes all feedback on these two new hospital/trust/MDT-level outcomes. Please send comments to us via this link (or e-mail: bowelcancer@nhs.net).

6.4 Rectal surgery volume

Volume outcome analyses have indicated that there are benefits for patient outcomes in many areas of surgery that are highly specialised. There is currently insufficient data to fully inform the debate on specialisation of rectal cancer in England and Wales. NBOCA acknowledges the importance of specialised MDT in complex decision-making around best practice in patients with rectal cancer and recognises the best outcomes reflect sound MDT recommendations, shared decision-making with patients through multidisciplinary consultations, practising evidence-based medicine as it evolves, technological advances, and participation in research and audit.

NICE commissioned and conducted a review of the limited available NBOCA evidence prior to release of the 2020 guidelines published in January. NICE guidance suggested that a minimum threshold of 10-20 rectal cancer resections per year at hospital-level may be associated with improved overall survival, local recurrence, permanent stoma rates and perioperative mortality. However, the evidence available was not deemed strong enough to set the institutional threshold at 20 cases per annum. The latest NICE guidance suggests that institutions should be performing a minimum of 10 cases per year and individual surgeons should be performing at least 5 rectal cancer resections per year.

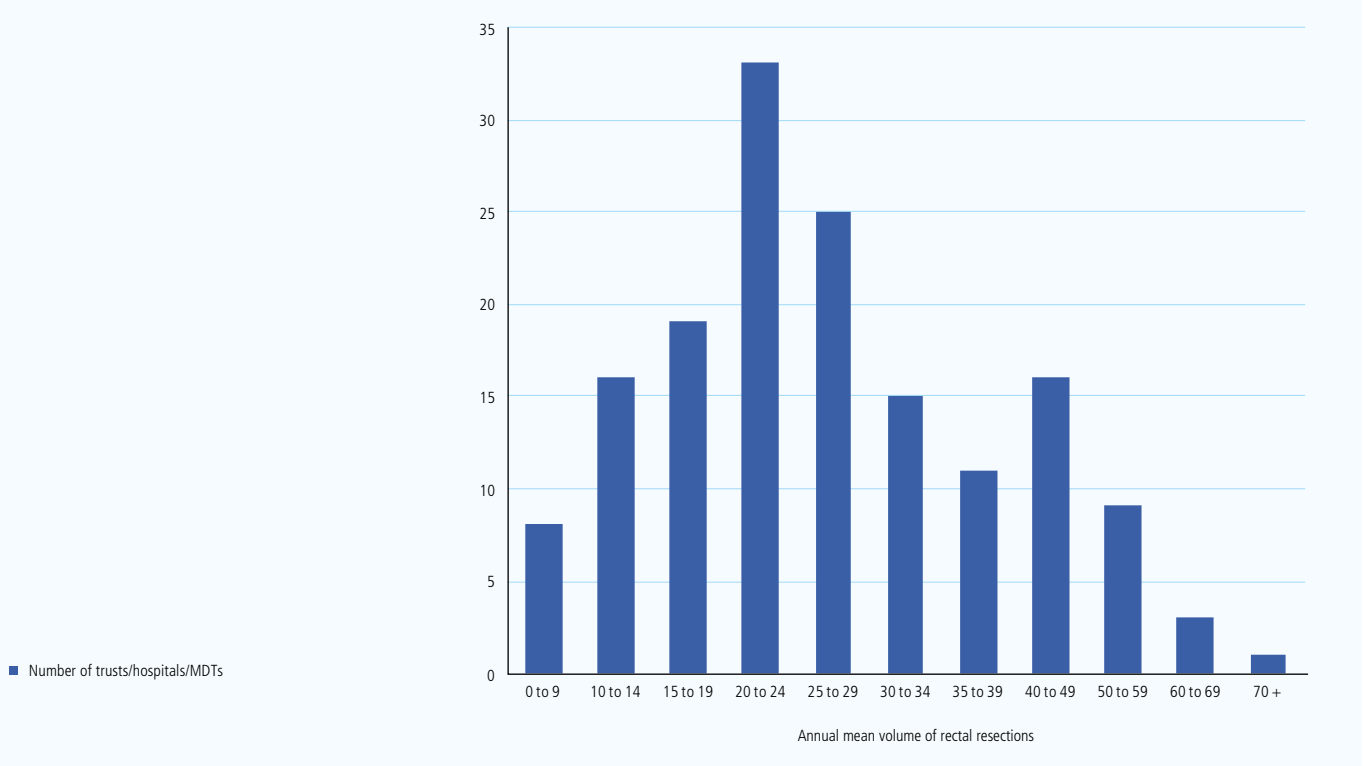
NBOCA openly acknowledges that, with such small volumes of rectal cancer resections at many trusts/hospitals/MDTs, it is difficult to provide meaningful volume-outcome associations at this level. Having recognised the variation in neo-adjuvant therapy for rectal cancer described in Section 6.1, it is also easy to understand how quickly other confounding factors may impact on oncological and functional outcomes of patients with rectal cancer.

NBOCA have historically reported on the number of rectal cases performed at hospital/trust/MDT level in the individual trust results, but the distribution of volumes has not been explored, or the volume of rectal cancer cases per surgeon.

Trust/Hospital/MDT level volumes

Figure 6.4 shows the mean annual volume of rectal resections per trust/hospital/MDT reported to NBOCA over four annual audit periods. The median annual number of rectal resections reported at institutional level was 25 (IQR 19 to 36). Just 1 trust/hospital/MDT (1% of all institutions offering rectal cancer surgery) had an average annual volume of 5 or less rectal resections, 8 trusts/hospitals/MDTs (5%) had less than 10 rectal resections, and 43 trusts/hospitals/MDTs (28%) had less than 20 rectal resections.

Figure 6.4
Mean annual volume of rectal resections reported to NBOCA at trust/hospital/MDT level for patients who underwent surgery between 01 April 2015 and 31 March 2019



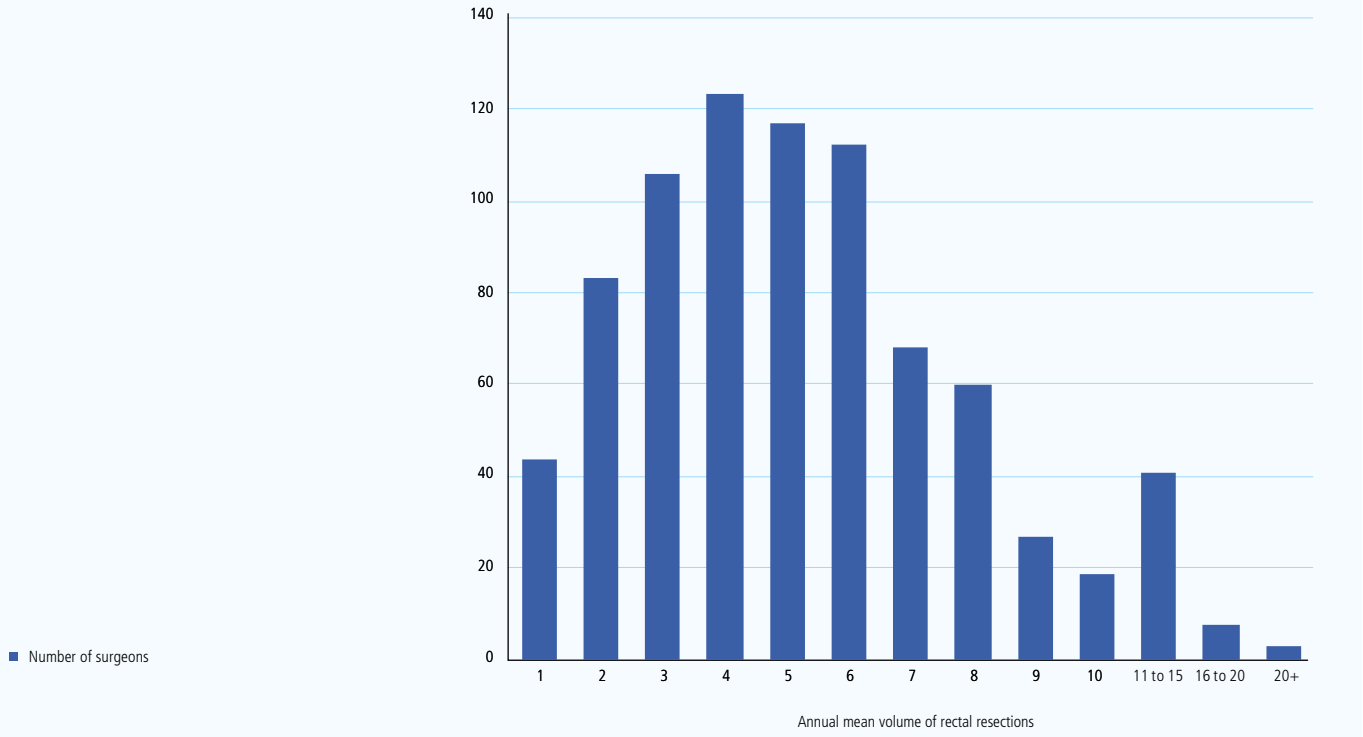
Surgeon level volumes

The mean annual volume of rectal resections per surgeon over four annual audit periods is shown in Figure 6.5. This identified 811 individual surgeons reported within the Clinical Outcomes Publication process. 7% of patient records did not have a corresponding surgeon's GMC number recorded, although this was spread evenly across the audit periods.

75% of surgeons were registered as ACPGBI members. 65% of surgeons had procedures recorded across all four audit periods, 19% across three periods, 11% across two periods and 5% in just one period. The number of audit periods for which the surgeon was 'active' was used to calculate the mean volume.

The median annual number of rectal cancer resections per surgeon was 5 (IQR 3 to 7). Over this timeframe, 5% of surgeons had an average of just 1 rectal resection recorded, 44% had less than 5 rectal resections and 91% less than 10 rectal resections. Thus, overall, 56% of individual surgeons performed 5 or more resections annually, in keeping with the updated NICE guidelines.

Figure 6.5
Mean annual volume of rectal resections reported to NBOCA at surgeon level for patients who underwent surgery between 01 April 2015 and 31 March 2019



Further work is required using linked HES-APC data to more accurately capture volumes.

Chapter Recommendations – Rectal cancer

- Further work exploring variation in practice in both the use and type of neo-adjuvant treatment is required to better understand reasons for variation and impact on patient outcomes as a result. NBOCA shall map further changes in radiotherapy practice as published recent evidence is assimilated into clinical practice and the COVID-19 experience are published.

- Welsh MDTs are encouraged to complete the pre-operative treatment field to ensure that radiotherapy data is available for Wales. NBOCA continues to work proactively to ensure that Welsh MDTs may be assured of accurate data uploads.

- NBOCA will report on i) 18-month unclosed diverting ileostomy rate and ii) permanent stoma procedure rate for the next audit reporting period. We encourage all trusts/hospitals/MDTs to provide us with feedback on these two new measures prior to their formal introduction as key performance indicators in the next audit year.

- In line with new NICE guidelines, NBOCA will formally report on rectal surgery volume as a performance indicator from the next audit reporting period. Further audit development work is required in preparation for this. NBOCA shall continue to support Getting It Right First Time (GIRFT) in this aspect of quality improvement.

Appendix 1 – Bowel cancer management – by English trust & Welsh MDT

This year, we are publishing all results on our website. Please access your individual Trust/hospital/MDT results by clicking on the relevant hyperlink below.

Trust/hospital/MDT results are also available in an Excel spreadsheet at: https://www.nboca.org.uk/reports/appendix_2020

North East and Cumbria
County Durham and Darlington NHS Foundation Trust
Gateshead Health NHS Foundation Trust
North Cumbria University Hospitals NHS Trust
North Tees and Hartlepool NHS Foundation Trust
Northumbria Healthcare NHS Foundation Trust
South Tees Hospitals NHS Foundation Trust
South Tyneside and Sunderland NHS Foundation Trust - South Tyneside District Hospital
South Tyneside and Sunderland NHS Foundation Trust - Sunderland Royal Hospital
The Newcastle Upon Tyne Hospitals NHS Foundation Trust
Lancashire & South Cumbria
Blackpool Teaching Hospitals NHS Foundation Trust
East Lancashire Hospitals NHS Trust
Lancashire Teaching Hospitals NHS Foundation Trust
University Hospitals of Morecambe Bay NHS Foundation Trust
Greater Manchester
Bolton NHS Foundation Trust
Manchester University NHS Foundation Trust - Manchester Royal Infirmary
Manchester University NHS Foundation Trust - Wythenshawe Hospital
Pennine Acute Hospitals NHS Trust
Salford Royal NHS Foundation Trust
Stockport NHS Foundation Trust
Tameside Hospital NHS Foundation Trust
The Christie NHS Foundation Trust
Wrightington, Wigan and Leigh NHS Foundation Trust
Humber, Coast and Vale
Hull and East Yorkshire Hospitals NHS Trust
Northern Lincolnshire and Goole NHS Foundation Trust
York Teaching Hospital NHS Foundation Trust- Scarborough Hospital
York Teaching Hospital NHS Foundation Trust- The York Hospital

South Yorkshire, Bassetlaw, North Derbyshire and Hardwick
Barnsley Hospital NHS Foundation Trust
Chesterfield Royal Hospital NHS Foundation Trust
Doncaster and Bassetlaw Hospitals NHS Foundation Trust
Sheffield Teaching Hospitals NHS Foundation Trust
The Rotherham NHS Foundation Trust
West Yorkshire
Airedale NHS Foundation Trust
Bradford Teaching Hospitals NHS Foundation Trust
Calderdale and Huddersfield NHS Foundation Trust
Harrogate and District NHS Foundation Trust
Leeds Teaching Hospitals NHS Trust
Mid Yorkshire Hospitals NHS Trust
Cheshire and Merseyside
Aintree University Hospital NHS Foundation Trust
Countess of Chester Hospital NHS Foundation Trust
Royal Liverpool and Broadgreen University Hospitals NHS Trust
Southport and Ormskirk Hospital NHS Trust
St Helens and Knowsley Hospitals NHS Trust
Warrington and Halton Hospitals NHS Foundation Trust
Wirral University Teaching Hospital NHS Foundation Trust
East Cheshire NHS Trust
Mid Cheshire Hospitals NHS Foundation Trust

West Midlands
George Eliot Hospital NHS Trust
Sandwell and West Birmingham Hospitals NHS Trust
Shrewsbury and Telford Hospital NHS Trust
South Warwickshire NHS Foundation Trust
The Dudley Group NHS Foundation Trust
The Royal Wolverhampton NHS Trust
University Hospitals Birmingham NHS Foundation Trust - Heartlands Hospital
University Hospitals Birmingham NHS Foundation Trust - Queen Elizabeth Hospital
University Hospitals Coventry and Warwickshire NHS Trust
University Hospitals of Derby and Burton NHS Foundation Trust - Queens Hospital (Burton)
University Hospitals of Derby and Burton NHS Foundation Trust - Royal Derby Hospital
University Hospitals of North Midlands NHS Trust
Walsall Healthcare NHS Trust
Worcestershire Acute Hospitals NHS Trust
Wye Valley NHS Trust
East Midlands
Kettering General Hospital NHS Foundation Trust
Northampton General Hospital NHS Trust
Nottingham University Hospitals NHS Trust
Sherwood Forest Hospitals NHS Foundation Trust
University Hospitals of Leicester NHS Trust
United Lincolnshire Hospitals NHS Trust – Lincoln and Grantham
United Lincolnshire Hospitals NHS Trust – Pilgrim Hospital Boston
East of England - North
Cambridge University Hospitals NHS Foundation Trust
East Suffolk and North Essex NHS Foundation Trust - Colchester Hospital
East Suffolk and North Essex NHS Foundation Trust - Ipswich Hospital
James Paget University Hospitals NHS Foundation Trust
Norfolk and Norwich University Hospitals NHS Foundation Trust
North West Anglia NHS Foundation Trust
The Queen Elizabeth Hospital, King's Lynn, NHS Foundation Trust
West Suffolk NHS Foundation Trust

East of England - South
Basildon and Thurrock University Hospitals NHS Foundation Trust
Bedford Hospital NHS Trust
East and North Hertfordshire NHS Trust
Luton and Dunstable University Hospital NHS Foundation Trust
Mid Essex Hospital Services NHS Trust
Milton Keynes Hospital NHS Foundation Trust
Southend University Hospital NHS Foundation Trust
West Hertfordshire Hospitals NHS Trust
The Princess Alexandra Hospital NHS Trust
Thames Valley
Buckinghamshire Healthcare NHS Trust
Great Western Hospitals NHS Foundation Trust
Oxford University Hospitals NHS Trust
Royal Berkshire NHS Foundation Trust
South East London
Guy's and St Thomas' NHS Foundation Trust
King's College Hospital NHS Foundation Trust - King's College Hospital
King's College Hospital NHS Foundation Trust - Princess Royal University Hospital
Lewisham and Greenwich NHS Trust
RM Partners (West London)
Chelsea and Westminster Hospital NHS Foundation Trust
Croydon Health Services NHS Trust
Epsom and St Helier University Hospitals NHS Trust
Imperial College Healthcare NHS Trust
Kingston Hospital NHS Foundation Trust
London North West Hospitals NHS Trust
St George's Healthcare NHS Trust
The Hillingdon Hospitals NHS Foundation Trust
The Royal Marsden NHS Foundation Trust
North Central London
North Middlesex University Hospital NHS Trust
Royal Free London NHS Foundation Trust
The Whittington Hospital NHS Trust
University College London Hospitals NHS Foundation Trust
North East London
Barking, Havering and Redbridge University Hospitals NHS Trust
Barts Health NHS Trust
Homerton University Hospital NHS Foundation Trust

Peninsula
Northern Devon Healthcare NHS Trust
Plymouth Hospitals NHS Trust
Royal Cornwall Hospitals NHS Trust
Royal Devon and Exeter NHS Foundation Trust
Torbay and South Devon Healthcare NHS Foundation Trust
Somerset, Wiltshire, Avon and Gloucestershire
Gloucestershire Hospitals NHS Foundation Trust
North Bristol NHS Trust
Royal United Hospitals Bath NHS Foundation Trust
Salisbury NHS Foundation Trust
Taunton and Somerset NHS Foundation Trust
University Hospitals Bristol NHS Foundation Trust
Weston Area Health NHS Trust
Yeovil District Hospital NHS Foundation Trust
Wessex
Dorset County Hospital NHS Foundation Trust
Hampshire Hospitals NHS Foundation Trust - Basingstoke and North Hampshire Hospital
Hampshire Hospitals NHS Foundation Trust - Royal Hampshire County Hospital
Isle of Wight NHS Trust
Poole Hospital NHS Foundation Trust
Portsmouth Hospitals NHS Trust
The Royal Bournemouth and Christchurch Hospitals NHS Foundation Trust
University Hospital Southampton NHS Foundation Trust
Kent & Medway
Dartford and Gravesham NHS Trust
East Kent Hospitals University NHS Foundation Trust
Maidstone and Tunbridge Wells NHS Trust
Medway NHS Foundation Trust

Surrey & Sussex
Ashford and St Peter's Hospitals NHS Foundation Trust
Brighton and Sussex University Hospitals NHS Trust
East Sussex Healthcare NHS Trust
Frimley Health NHS Foundation Trust - Heatherwood and Wexham Park Hospitals
Frimley Health NHS Foundation Trust - Frimley Park Hospital
Royal Surrey County Hospital NHS Foundation Trust
Surrey and Sussex Healthcare NHS Trust
Western Sussex Hospitals NHS Foundation Trust- St. Richard's Hospital
Western Sussex Hospitals NHS Foundation Trust- Worthing Hospital
Wales
Bronglais MDT
Cardiff MDT
Nevill Hall Hospital MDT
Prince Charles Hospital MDT
Princess of Wales MDT
Royal Glamorgan Hospital MDT
Royal Gwent Hospital MDT
Swansea MDT
West Wales General & Prince Phillip MDT
Withybush General MDT
Ysbyty Glan Clwydd MDT
Ysbyty Gwynedd MDT
Ysbyty Maelor MDT

Appendix 2 – Outlier communications

This year, we are also publishing the individual outlier responses on our website.

Please click here to access them.

Appendix 3 – Glossary

Abdomino-perineal excision of the rectum (APER) – operation to remove the entire rectum and anal canal. The patient is left with a permanent stoma.

Adjusted – a way of reporting results that takes into account differences between the patients that each trust/hospital/MDT or region is treating. This allows comparisons to be made more fairly.

Anterior resection – operation to remove part, or all, of the rectum.

Cancer alliance – at a regional level, results in England are reported according to cancer alliance. This is a particular geographical area containing many hospitals. There are 21 cancer alliances.

Chemotherapy – drug therapy used to treat cancer. It may be used alone, or in combination with other types of treatment (for example surgery or radiotherapy).

Circumferential resection margin – this refers to the surface of the specimen which has been removed and involves measuring how much healthy tissue surrounds the tumour. A negative circumferential resection margin (CRM) is defined as more than 1mm of healthy tissue beyond the tumour. Surgeons want to achieve a negative CRM when they remove a tumour as it reduces the risk of the tumour coming back again in the future.

Complete clinical response (cCR) – this is a term used to describe the disappearance of a rectal tumour following neo-adjuvant treatment according to clinical, radiological and endoscopic investigations. This means that the tumour is no longer visible on scans or a 'camera' test of the bowel. It might be possible for patients with complete clinical response to undergo 'watch and wait' rather than surgery. This involves intensive follow-up to monitor for tumour regrowth.

Complete pathological response (cPR) – this is a term used to describe the disappearance of a rectal tumour following neo-adjuvant treatment according to pathological investigation. This means that, following surgical removal of the bowel, the tumour is not visible when the specimen is examined by the histopathologist.

Curative intent – the aim of the treatment is to cure the patient of the disease.

Hartmann's procedure – operation to remove an area of the bowel on the left hand side of the abdomen and top end of the rectum. It involves the formation of a stoma, but this is not necessarily permanent.

Health board – in Wales, bowel cancer services are provided by Health Boards which serve distinct geographical areas. There are 7 Health Boards. The multidisciplinary teams operate within these.

Faecal Immunochemical Test (FIT) – a poo sample is provided by the patient and is then tested for the amount of blood within it. Abnormal levels of blood within the poo will lead to a recommendation for telescopic examination of the bowel. FIT testing is used as part of national screening for asymptomatic patients, but can also be used for 'low risk' symptomatic patients. The level of blood which needs to be detected in the poo for symptomatic patients is much lower than for screening. This means that a recent negative screening test should not be relied upon if patients subsequently present with symptoms.

Laparoscopic – also known as minimally invasive surgery or keyhole surgery. This is a type of surgical procedure performed through small cuts in the skin instead of the larger cuts used in open surgery.

Local excision – procedure done with instruments inserted through the anus (often during a colonoscopy), without cutting into the skin of the abdomen, to remove just a small piece of the lining of the colon or rectum wall.

Lymph nodes – small bean shaped organs, also referred to as lymph 'glands', which form part of the immune system. They are distributed throughout the body and can be one of the first places to which cancers spread.

Metastases – cancer that has spread from where it first started in the body. These can also be called secondary cancers.

Multidisciplinary Team (MDT) – an MDT is a group of bowel cancer experts based within a hospital who discuss and plan the treatment of every patient with bowel cancer. The MDT includes surgeons, cancer specialists, nurses, radiologists, histopathologists and palliative care physicians. Patients from referring hospitals will be discussed in their closest specialist bowel MDT. At a local level, results from Wales are reported according to multidisciplinary teams. There are 13 Welsh MDTs.

National data opt out – this allows patients in England who do not want their personal confidential information to be used for purposes other than their individual care to register this fact with NHS Digital. This replaced the registration of type 2 objections via GP practices in May 2018 and anyone with an existing type 2 objection would have been automatically opted out of this as well.

Open surgery – an operation carried out by cutting an opening in the abdomen.

Permanent colostomy – this is a type of stoma. It involves bringing out a section of large bowel on to the surface of the abdomen. This type of stoma cannot be reversed. It is formed when two ends of bowel cannot be joined back together or, sometimes, if joining together the two ends of bowel would result in poor bowel function which would impair a patient's quality of life.

Palliative care – care given to patients whose disease cannot be cured. It aims to improve quality of life rather than extending life.

Pelvic sidewall clearance – there can be infiltration of tumour in to the pelvic wall with either a primary tumour or following recurrence of disease. This can be due to direct invasion of the tumour or because of involved lymph nodes on the pelvic wall. Resection of the pelvic wall can be undertaken to remove this disease, with the extent of surgery depending on which parts of the pelvis are affected.

Radiotherapy – the treatment of disease, especially cancer, using x-rays or similar forms of radiation.

Robotic surgery – this is a relatively new advancement in surgery and allows surgeons to control surgical instruments whilst sitting at a special console away from the patient during the operation.

Screening – patients aged 60-74 are invited to take part in this every two years. They do this by providing a poo sample that is tested for traces of blood. They will be invited to have a camera test of the bowel if this is positive.

Stage – a way of describing the size of a cancer and how far it has grown. Staging is important because it helps decide which treatments are required.

Stent – a flexible, hollow tube designed to keep a section of the bowel open when it has become blocked.

Stoma – a surgical opening in the abdomen through which the bowel is brought out onto the surface of the skin. Colostomy and ileostomy are types of stoma.

Temporary ileostomy – this is a type of stoma. It involves bringing out a section of small bowel on to the surface of the abdomen. A temporary ileostomy is often formed during an anterior resection procedure for rectal cancer. During an anterior resection, the section of bowel containing the tumour is removed and the ends are anastomosed (joined) back together. The ileostomy is made before the site of the join and diverts poo to allow the join time to heal and also if the join were to leak, the consequences should be less severe. This type of stoma can be reversed (small bowel put back inside abdomen) once the join has healed.

Transanal Total Mesorectal Excision (TaTME) – this is also known as 'bottom up' surgery. It involves dissection of the rectum via the anus using standard laparoscopic instruments. It is an alternative approach to laparoscopic, robotic and open dissection via the abdomen. It is used in highly selected cases; notably very low rectal cancers, and often in male patients (due to the narrower pelvis), or those with high body mass index.

Trust – an organisation within the English NHS, made up of one or more hospitals, and generally serving one geographical area.