

**BOWEL CANCER OUTCOMES REGISTRY**

**2022**

**BCOR QUALITY**



**REPORT**

**Epworth Hospital Group**

**The Bowel Cancer Outcomes Registry is principally funded by:**



The Colorectal Surgical Society of Australia and New Zealand (CSSANZ) is the professional body that represents Australian and New Zealand Colorectal Surgeons. CSSANZ members voluntarily fund the majority of costs associated with BCOR to advance the quality of colorectal cancer care in Australia and New Zealand.

**Partners:**



Monash University through both the Cancer Research Program and Clinical Outcomes data Reporting and Research Program provide database hosting and a secure research environment as well as Academic and Clinical Research guidance, Advocacy and Registry Science expertise. Monash is a leader in multiple Cancer Outcomes Registries and a critical partner in ongoing development of the BCOR.

**Endorsed by:**



**Supporters:**



## Contents

<b>1 Data analyses</b>	<b>4</b>
<b>2 Annual participation (2020 - 2022)</b>	<b>5</b>
<b>3 Data completeness (2022)</b>	<b>5</b>
<b>4 BCOR primary key performance indicators</b>	<b>6</b>
4.1 Inpatient mortality . . . . .	6
4.2 Number of lymph nodes examined . . . . .	7
4.3 Return to theatre . . . . .	8
4.4 Anastomotic leak . . . . .	9
4.5 Circumferential margins for rectal cancer . . . . .	12
<b>5 BCOR secondary key performance indicators</b>	<b>14</b>
5.1 Length of stay . . . . .	14
5.2 Surgical complications . . . . .	15
5.3 End stoma . . . . .	17
5.4 Rectal cancer: MRI . . . . .	18
5.5 Rectal cancer: Discussion at MDT . . . . .	19
<b>6 Disclaimer</b>	<b>20</b>

## 1 Data analyses

Three year (2020 - 2022) data was used to generate funnel plots as this period would provide us with enough power and recency of information. Funnel plot is a visual representation of how individual units fare compared to their peers and the overall average; it also identifies those who are performing better or worse than the average. The funnel plot contours represent two standard deviations (95% control limits) and three standard deviations (99.8% control limits) from the mean, those above and below these lines are considered outliers, with a 5% and 0.2% chance of a false positive. In the preparation of funnel plots all units of less than 10 operations were grouped in a single group (labelled 'lumped sites group'). Including this group, there were 120 units analysed. For the 120 units the median number of operation was 58 (mean 110, SD 133), with a range from 1 operation to a maximum of 665 operations.

Some of the funnel plots present unadjusted crude rate or mean while others (where noted) are risk-adjusted. Risk-adjustment considers differences in patient-level risk-factors; it enables adjustment for confounding variables which are beyond the control of the surgeon or healthcare system. The risk-adjustment models were revised in December 2018, which included both statistical and clinical considerations. The variables used in the risk adjustment model are noted under each graph. Clinical input identified the following risk factors: age, sex, ASA grade, urgency of surgery, cancer type, neoadjuvant therapy, and tumour stage. Statistical modelling including the likelihood ratio test was used to identify multivariate and independently significant risk factors. A separate category for missing data was created and included in the model. Due to potential bias in interpretation, units with less than 20% of complete data on endpoint and risk factors were not included in the risk adjusted funnel plots.

For length of hospital stay (LOS), we excluded LOS  $\leq 0$  and  $> 30$  days as these were deemed clinically unlikely and potential data entry errors. This resulted in 100% of all data submitted included in the analysis. This approach was also applied to the lymph node data, with the highest figure of 40 as cutoff as this represents 95% of all data submitted.

## 2 Annual participation (2020 - 2022)

Table 1: Number of episodes entered by your hospital per year

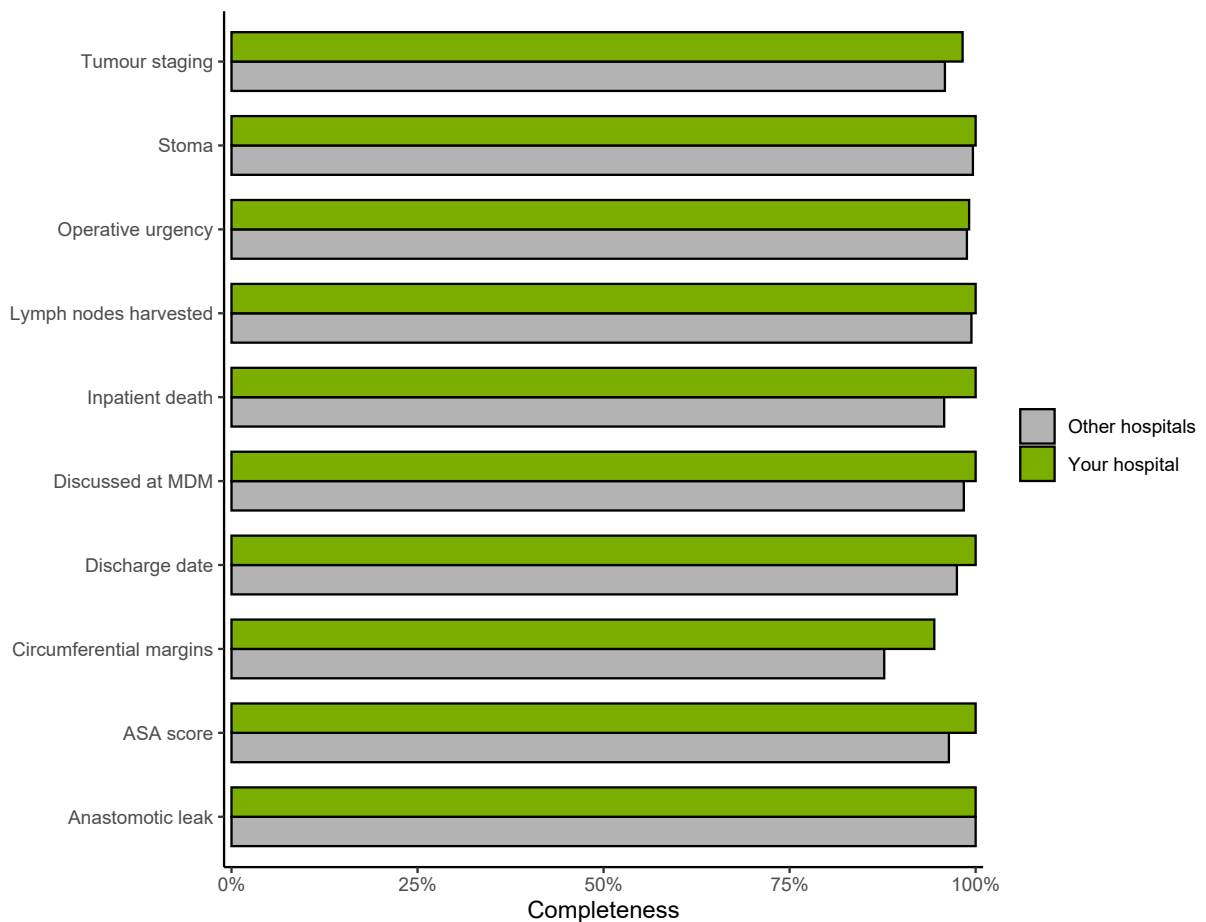
Year	Number of episodes
2020	74
2021	99
2022	114

*Note:*

Only treatment episodes with performed surgery were included.

## 3 Data completeness (2022)

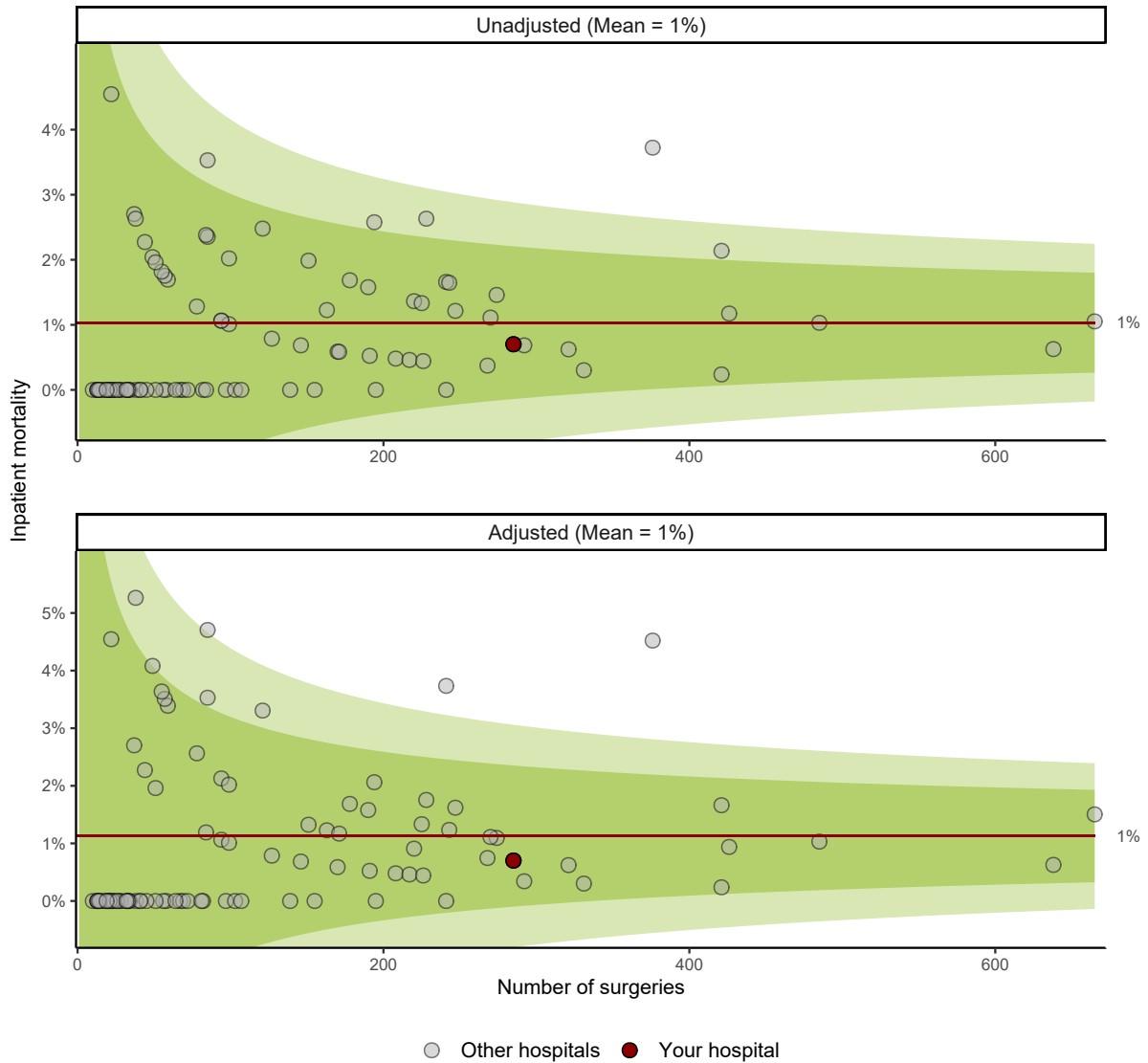
Figure 1: Data completeness (2022)



## 4 BCOR primary key performance indicators

### 4.1 Inpatient mortality

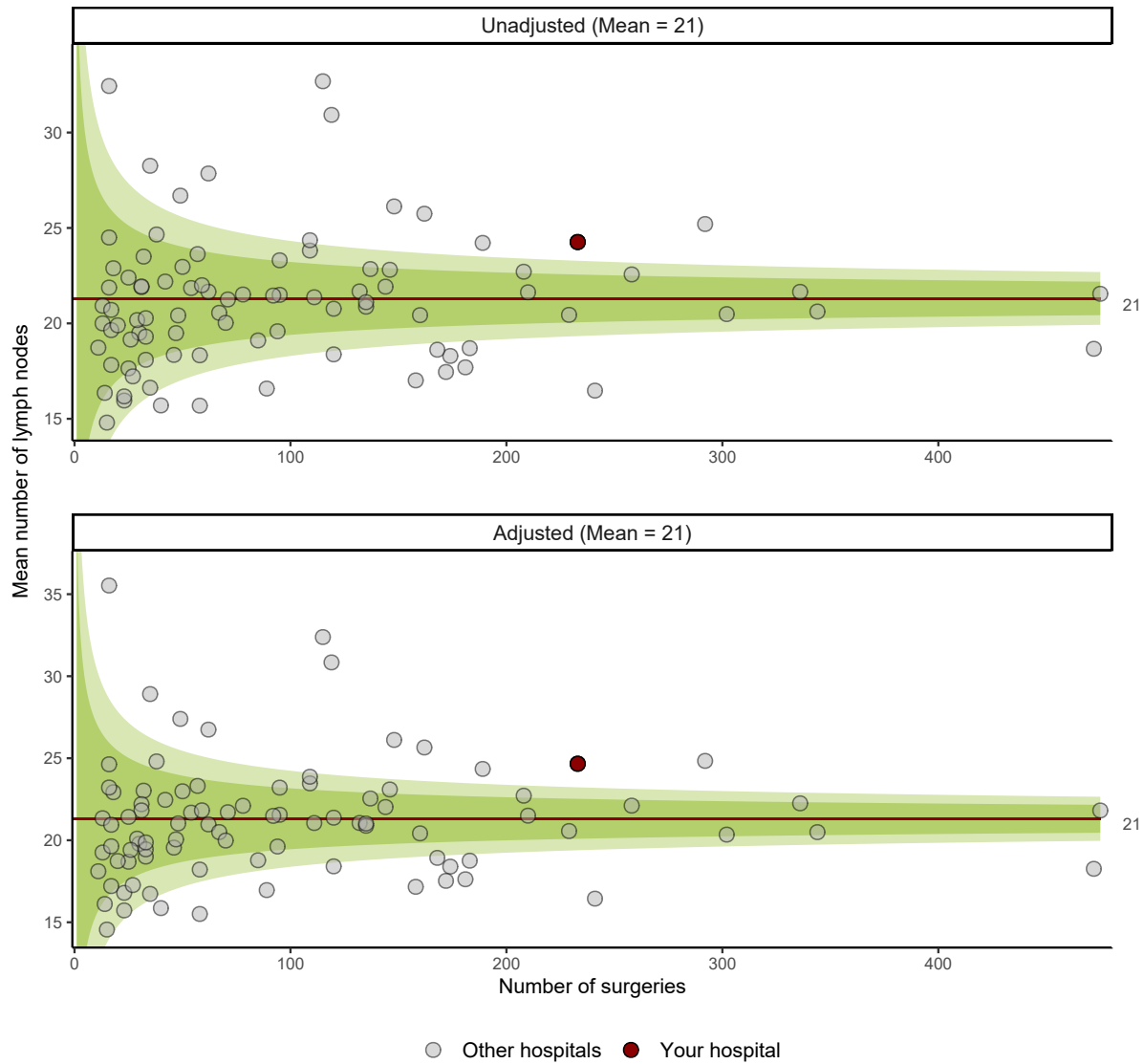
Figure 2: Inpatient mortality rate (2020 - 2022)



Adjusted for ASA score, patient age at diagnosis, operative urgency, overall stage, and sex.  
Shaded areas represent 95 and 99.8% control limits.  
4 sites were excluded due to low completeness of the adjusting covariates and/or outcome.

## 4.2 Number of lymph nodes examined

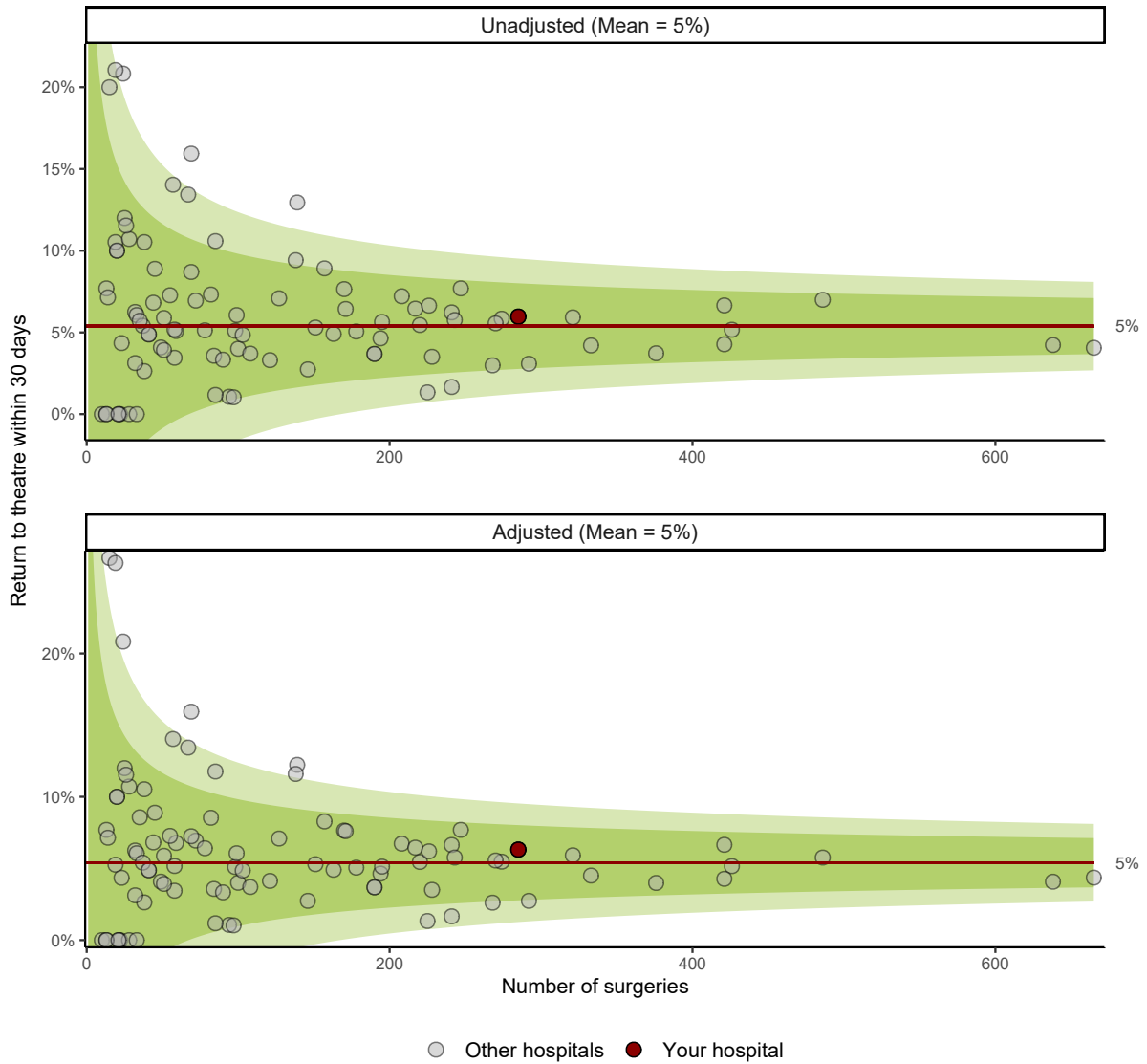
Figure 3: Mean number of lymph nodes examined (2020 - 2022)



Adjusted for overall stage, patient age at diagnosis, operative urgency, sex, and ASA score.  
Shaded areas represent 95 and 99.8% control limits.  
1 site was excluded due to low completeness of the adjusting covariates and/or outcome.

### 4.3 Return to theatre

Figure 4: Rate of return to theatre (2020 - 2022)



Adjusted for cancer type, ASA score, sex, and operative urgency.  
Shaded areas represent 95 and 99.8% control limits.  
1 site was excluded due to low completeness of the adjusting covariates and/or outcome.



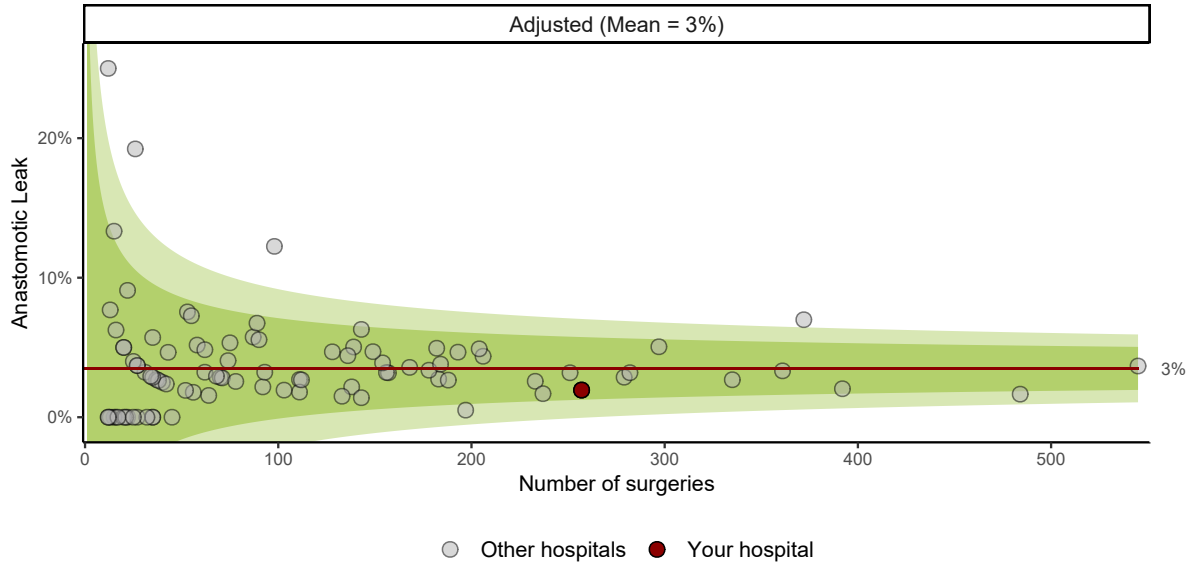
#### 4.4 Anastomotic leak

Table 2: Anastomotic leak rate

Period	Cancer type	Other hospitals	Your hospital
2022	Colon	3% (77/2601)	2% (2/95)
	Rectal	7% (40/597)	0% (0/13)
2020 - 2022	Colon	3% (238/8137)	2% (4/229)
	Rectal	5% (118/2159)	4% (1/27)



Figure 7: Rate of anastomotic leak (2020 - 2022)



Adjusted for sex, cancer type, ASA score, and patient age at diagnosis.  
Shaded areas represent 95 and 99.8% control limits.  
1 site was excluded due to low completeness of the adjusting covariates and/or outcome.

### 4.5 Circumferential margins for rectal cancer

Table 3: Positive circumferential margin rate

Period	Margin involvement	Other hospitals	Your hospital
2022	Negative (>1mm)	93% (737/795)	100% (16/16)
	Positive (<=1mm)	7% (58/795)	0% (0/16)
2020 - 2022	Negative (>1mm)	94% (2543/2718)	100% (28/28)
	Positive (<=1mm)	6% (175/2718)	0% (0/28)

Figure 8: Rate of rectal cancer patients with positive circumferential margin involvement (2020 - 2022)

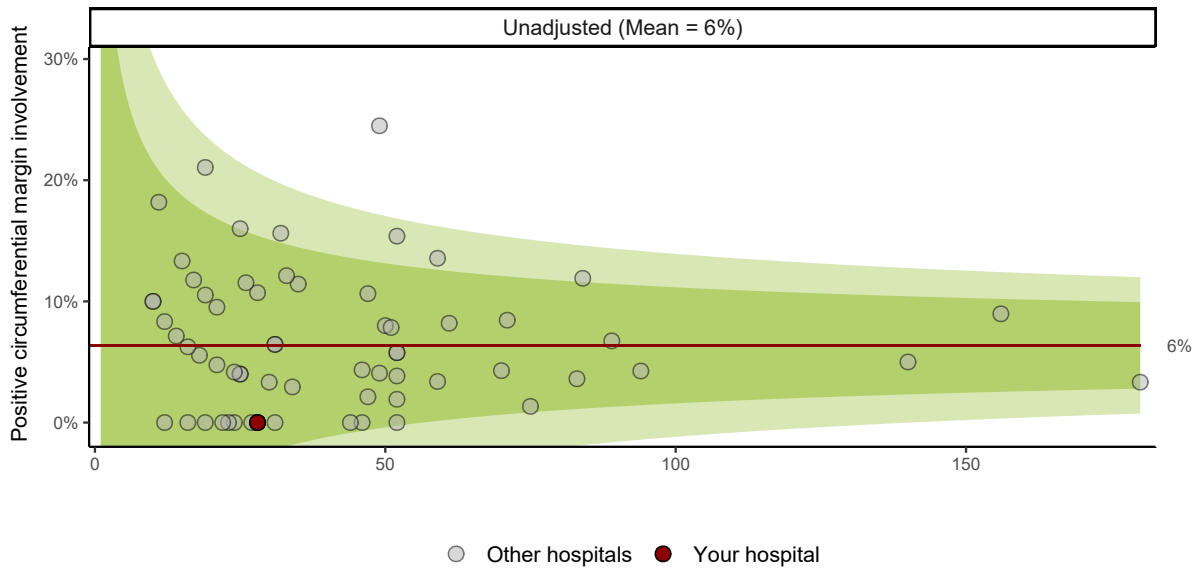
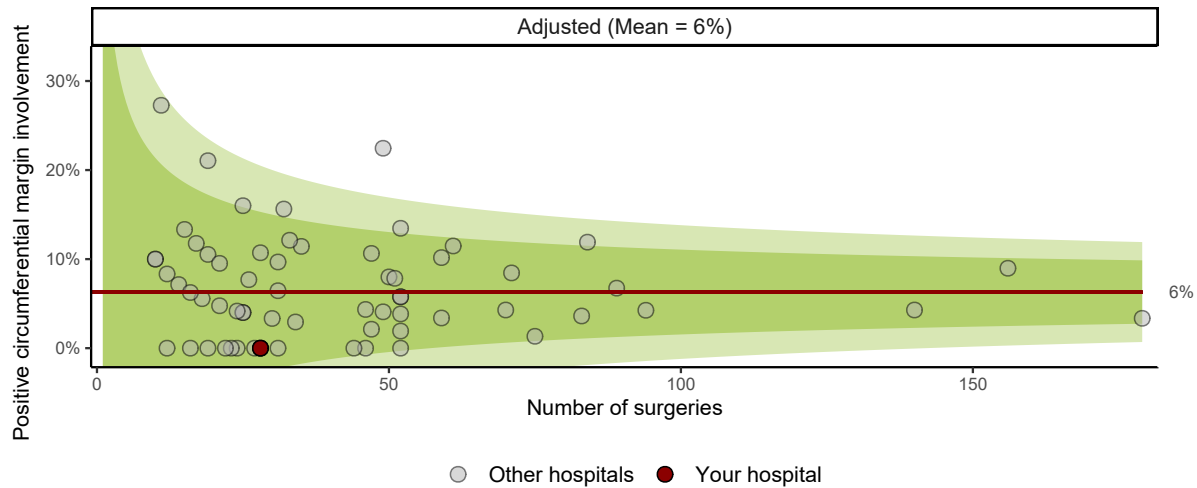
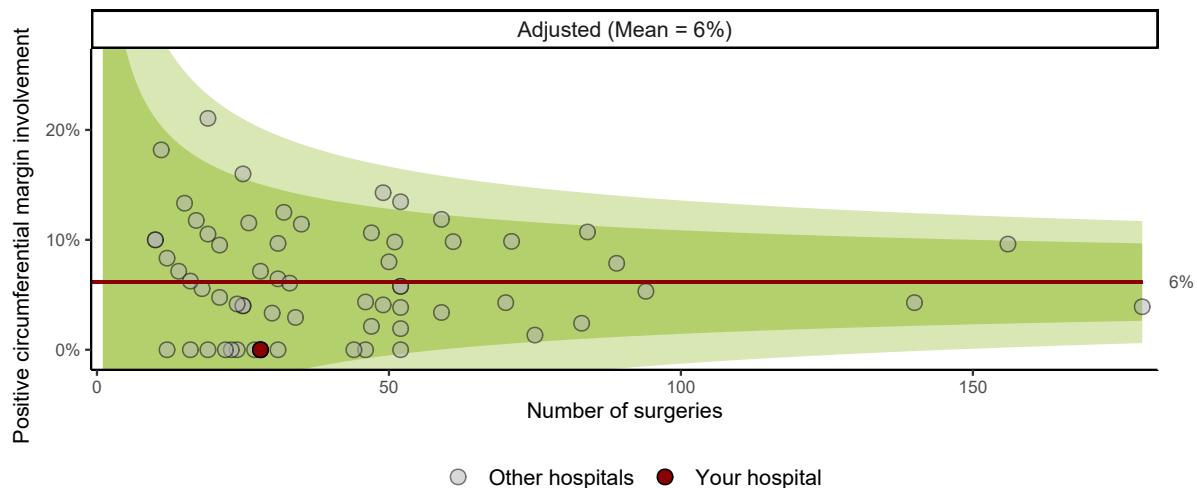


Figure 9: Rate of rectal cancer patients with positive circumferential margin involvement (2020 - 2022, Adjusted for overall stage, operative urgency, and neoadjuvant therapy).



Adjusted for overall stage, operative urgency, and neoadjuvant therapy.  
 Shaded areas represent 95 and 99.8% control limits.  
 4 sites were excluded due to low completeness of the adjusting covariates and/or outcome.

Figure 10: Rate of rectal cancer patients with positive circumferential margin involvement (2020 - 2022, Adjusted for Pre-operative T stage, and sex).

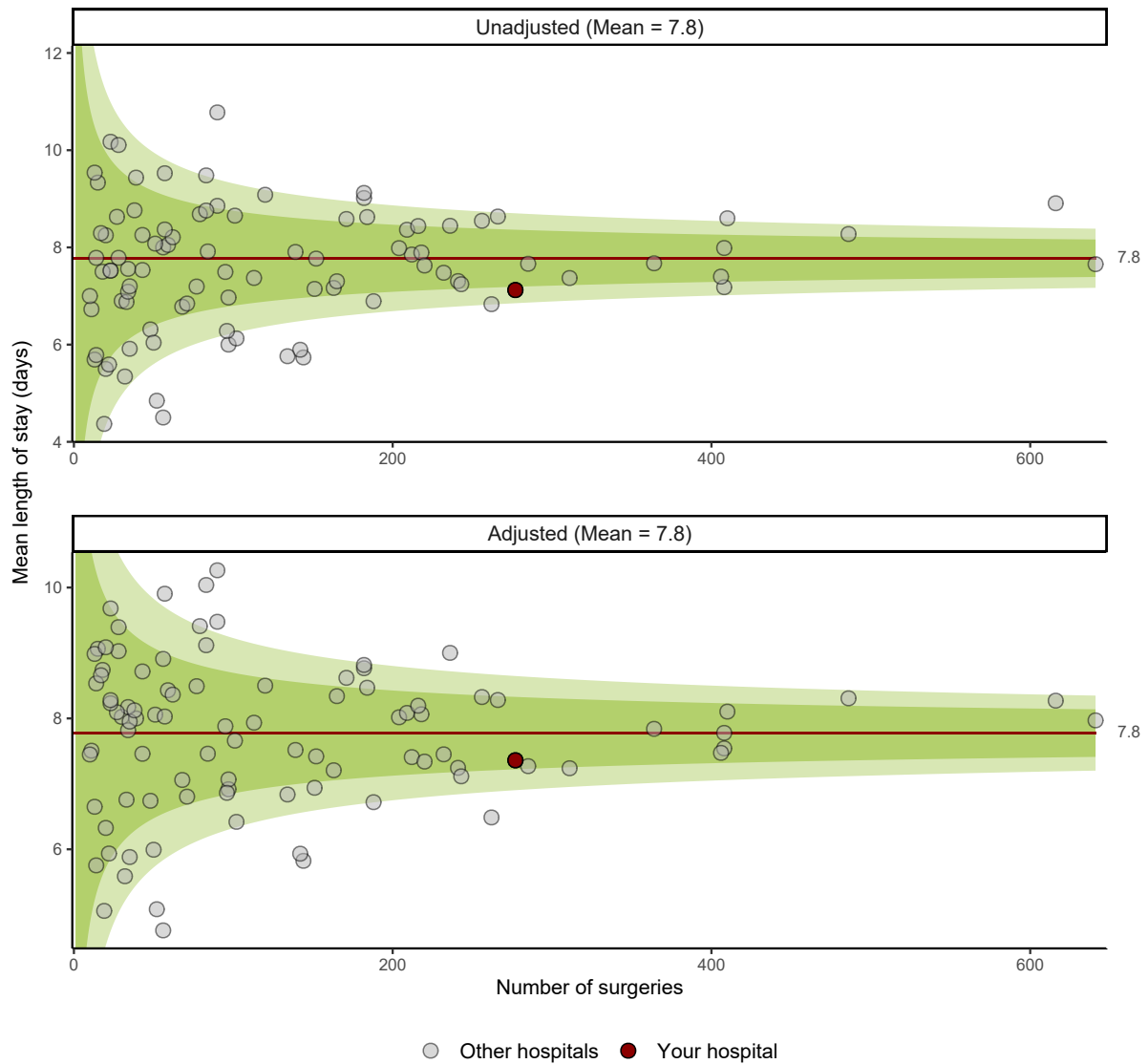


Adjusted for Pre-operative T stage, and sex.  
 Shaded areas represent 95 and 99.8% control limits.  
 4 sites were excluded due to low completeness of the adjusting covariates and/or outcome.

## 5 BCOR secondary key performance indicators

### 5.1 Length of stay

Figure 11: Mean length of stay (2020 - 2022)



Adjusted for ASA score, cancer type, operative urgency, patient age at diagnosis, overall stage, and sex.  
Shaded areas represent 95 and 99.8% control limits.  
No sites were excluded due to low completeness of the adjusting covariates and/or outcome.

## 5.2 Surgical complications

Figure 12: Rate of surgical complications in colon cancer patients (2020 - 2022)

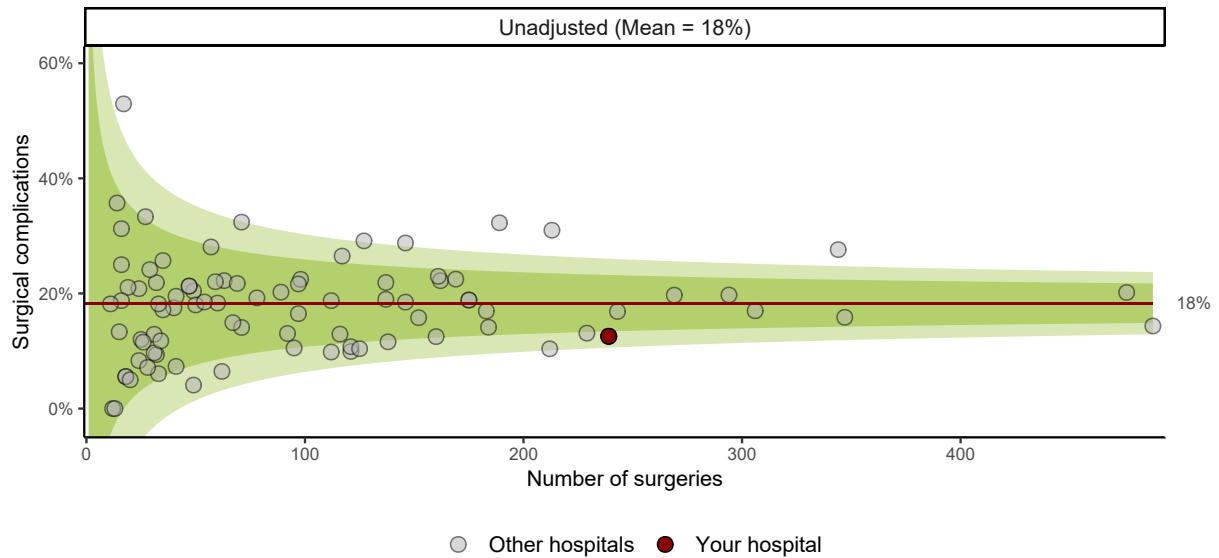
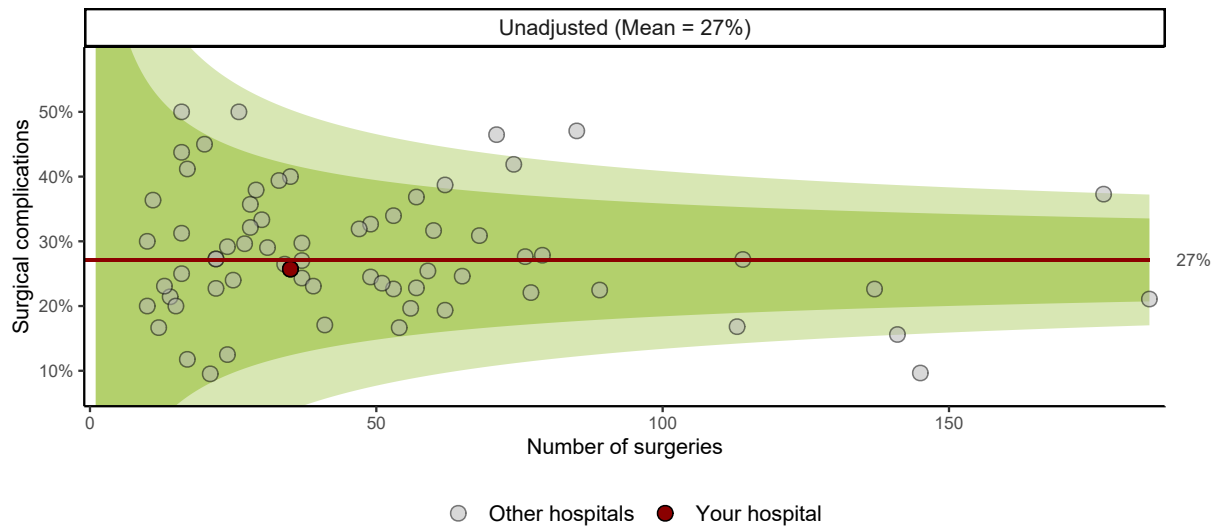
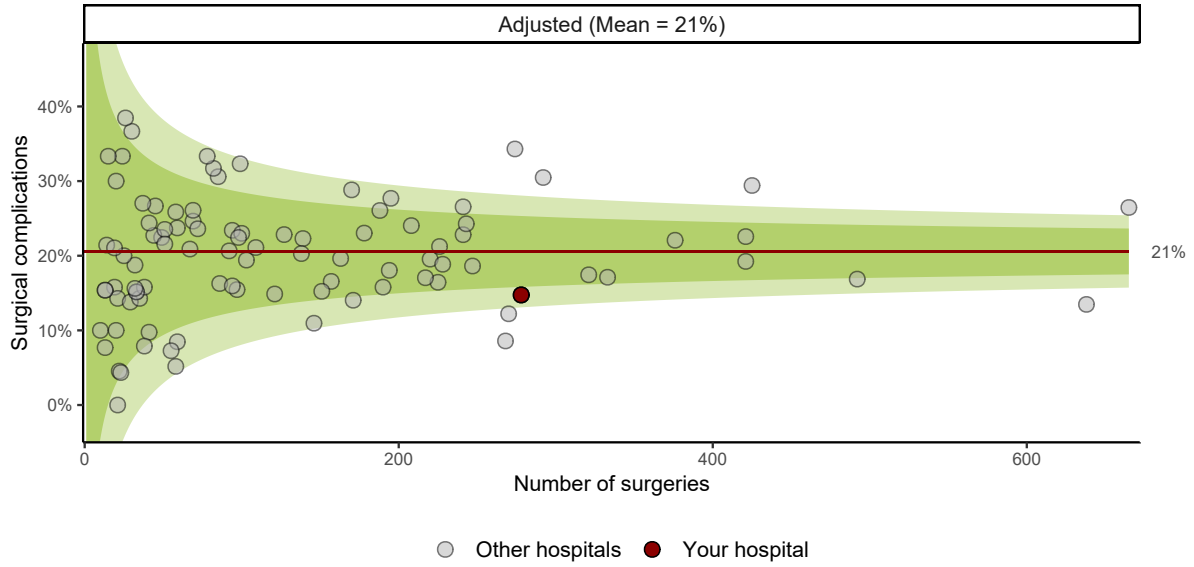


Figure 13: Rate of surgical complications in rectal cancer patients (2020 - 2022)



Shaded areas represent 95 and 99.8% control limits.

Figure 14: Rate of surgical complications in colorectal cancer patients (2020 - 2022)



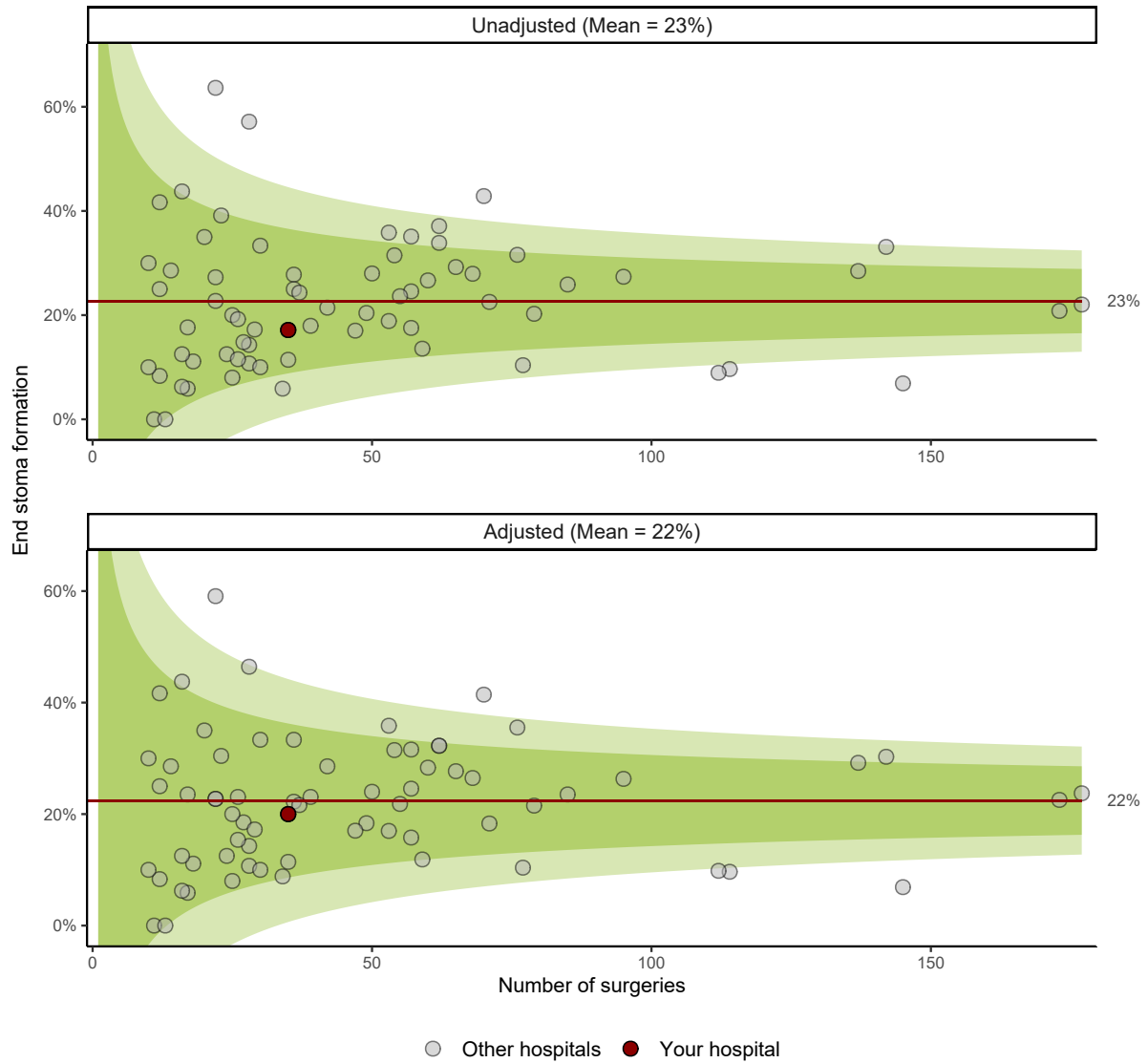
Adjusted for cancer type, ASA score, sex, operative urgency, and overall stage.  
Shaded areas represent 95 and 99.8% control limits.

1 site was excluded due to low completeness of the adjusting covariates and/or outcome.



### 5.3 End stoma

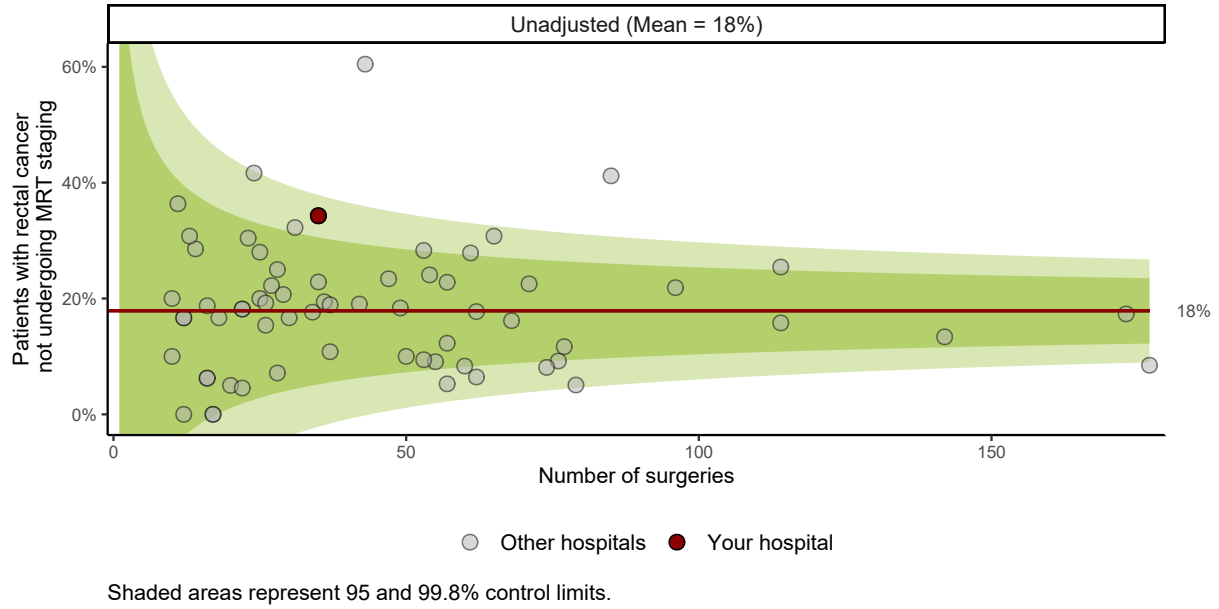
Figure 15: End stoma rate (2020 - 2022)



Adjusted for ASA score, patient age at diagnosis, overall stage, and operative urgency.  
Shaded areas represent 95 and 99.8% control limits.  
No sites were excluded due to low completeness of the adjusting covariates and/or outcome.

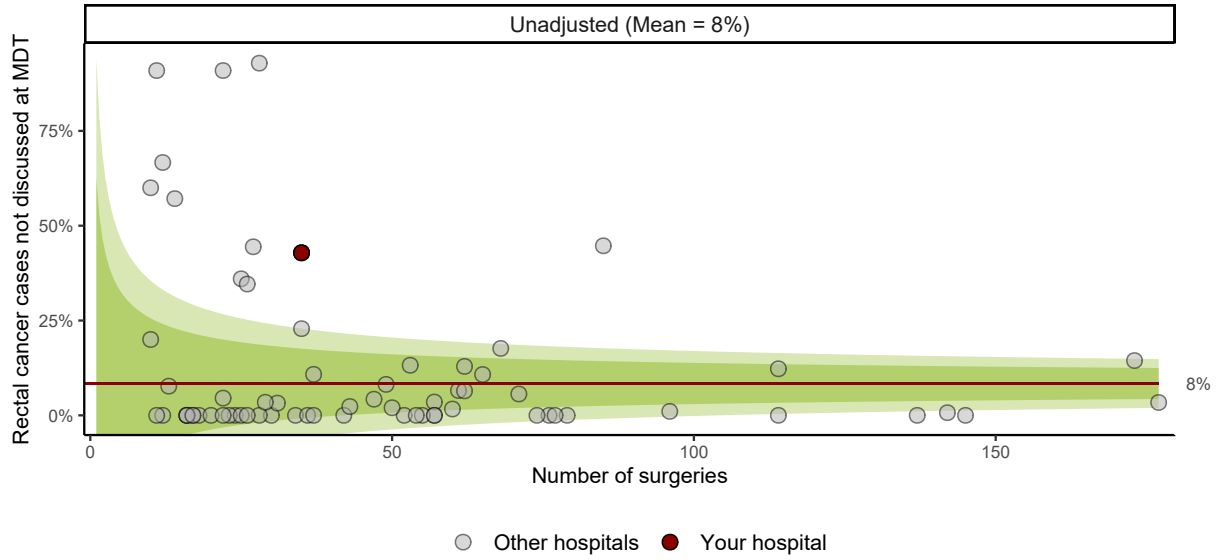
### 5.4 Rectal cancer: MRI

Figure 16: Rate of rectal cancer patients who received surgical treatment, but were not staged using MRI (2020 - 2022).



### 5.5 Rectal cancer: Discussion at MDT

Figure 17: Rate of rectal cancer patients who received surgical treatment not discussed at MDT (2020 - 2022)



Shaded areas represent 95 and 99.8% control limits.

## 6 Disclaimer

BCOR dataset represents an estimated 21.7% of Australia and New Zealand colorectal cancer data entered by 470 clinicians from 161 hospitals participating in BCOR. Hence, the position of the unit identified in this report must be interpreted with this in mind and may be within the common bounds if all colorectal cancer surgeries in Australia and New Zealand were entered into BCOR.

Please email BCOR project manager with any queries relating to the data contained in this report. Note that whilst every effort is made to ensure data accuracy, the report is reliant on information provided to BCOR.  
E: [contact@bowelcanceraudit](mailto:contact@bowelcanceraudit).

# Thank You.

To the clinicians, health care providers and patients who contribute time, expertise and data that helps improve the care of bowel cancer sufferers in Australia and New Zealand



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