

# National GI Endoscopy Quality Improvement Programme



## 3<sup>rd</sup> National Data Report 2017-2018

CONJOINT BOARD IN IRELAND  
of the  
Royal College of Physicians and Royal College of Surgeons





# National GI Endoscopy Quality Improvement Programme

**3<sup>rd</sup> National Data Report  
2017-2018**



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# Hospitals Contributing to 2017-2018 Data Set



Bantry General Hospital	Beacon Hospital	Beaumont Hospital
Blackrock Clinic, Dublin	Bon Secours Hospital Dublin	Bon Secours Hospital Galway
Bon Secours Hospital Tralee	Cavan General Hospital	Connolly Hospital Blanchardstown
Cork University Hospital	Ennis Hospital	Galway Clinic
Galway University Hospital	Hermitage Medical Clinic	Kerry University Hospital
Letterkenny University Hospital	Louth County Hospital	Mater Misericordiae University Hospital
Mater Private Hospital	Mercy University Hospital, Cork	Midlands Regional Hospital Mullingar
Midlands Regional Hospital Tullamore	Naas General Hospital	Nenagh Hospital
Our Lady of Lodes Hospital, Drogheda	Our Lady's Hospital, Navan	Roscommon County Hospital
Sligo University Hospital	South Infirmary-Victoria University Hospital	South Tipperary General Hospital
St James' Hospital, Dublin	St. John's Hospital Limerick	St Luke's General Hospital, Kilkenny
St Michael's Hospital, Dun Laoghaire	St. Vincent's University Hospital, Dublin	Tallaght University Hospital
University Hospital Limerick	University Hospital Waterford	Wexford General Hospital



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## FOREWORD

The Conjoint Board of the Royal College of Physicians of Ireland (RCPI) and the Royal College of Surgeons in Ireland (RCSI) launched the GI Endoscopy National Quality Improvement Programme (EQI Programme) in October 2011 in collaboration with the National Cancer Control Programme. As of 2014, this programme has been undertaken with funding from the HSE Quality Improvement Division.

The core tenet of the programme is to provide non-judgmental and encouraging support to participating endoscopy units in collecting and uploading their data and conducting QI activities.

The roll out of the EQI Programme has continued throughout 2018 with 41 units now live on NQAIS-Endoscopy. Of these, 39 units were in a position to submit data to this year's National Data Report. This is the third annual report on the national anonymised aggregate data contained within the reporting tool, NQAIS-Endoscopy, from **7th July 2017 to 8th July 2018**. It gives a picture of the state of quality in endoscopy in Ireland for the full training year and should be used to influence decisions regarding the future of the endoscopy service. Where applicable, this report will use "minimum" and "achievable" targets, this reflects the amalgamation of symptomatic and screening guidelines in 2017.

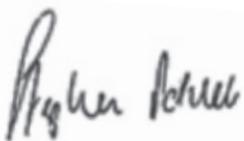
National Data Reports created by the EQI Programme should be used to inform health policies surrounding the endoscopy service in Ireland and to help identify variation in practices between each hospital. Where statistics suggest that there may be an area in need of improvement in a hospital, findings should be confirmed locally using local hospital data.

Although data has matured in this third year of analysis, this local confirmation of significant findings remains essential.

The EQI Programme would like to acknowledge the support of the HSE Acute Operations Endoscopy Programme for supporting and embedding quality measures in endoscopy in hospitals nationwide. The Acute Operations Endoscopy Programme has been working to strengthen the role of EQI Programme data in individual unit, hospital group and national governance structures for endoscopy. The appointment of Hospital Group Clinical Leads for Endoscopy has been an important development for endoscopy services.

The importance of individual users and clinicians accessing their own performance data is also included in updated accreditation standards for endoscopy services published earlier this year by JAG, the Joint Advisory Group on GI Endoscopy (UK). This is another important development in strengthening and embedding quality improvement in endoscopy.

The EQI Programme Working Group would like to acknowledge the clinical leads and local operational managers within each hospital for leading the continued work of data collection, collation and quality improvement initiatives in their hospitals.



**Prof Steve Patchett**  
**Chair of the EQI Programme Working Group**



## INTRODUCTION TO ANALYSIS

The information presented in this report is based on data pertaining to Quality Improvement activities performed by GI Endoscopy Units across Ireland. This data has been uploaded to NQAIS-Endoscopy from Endoscopy Reporting Systems (ERS) in 39 hospitals nationwide.

### DATA COLLECTION

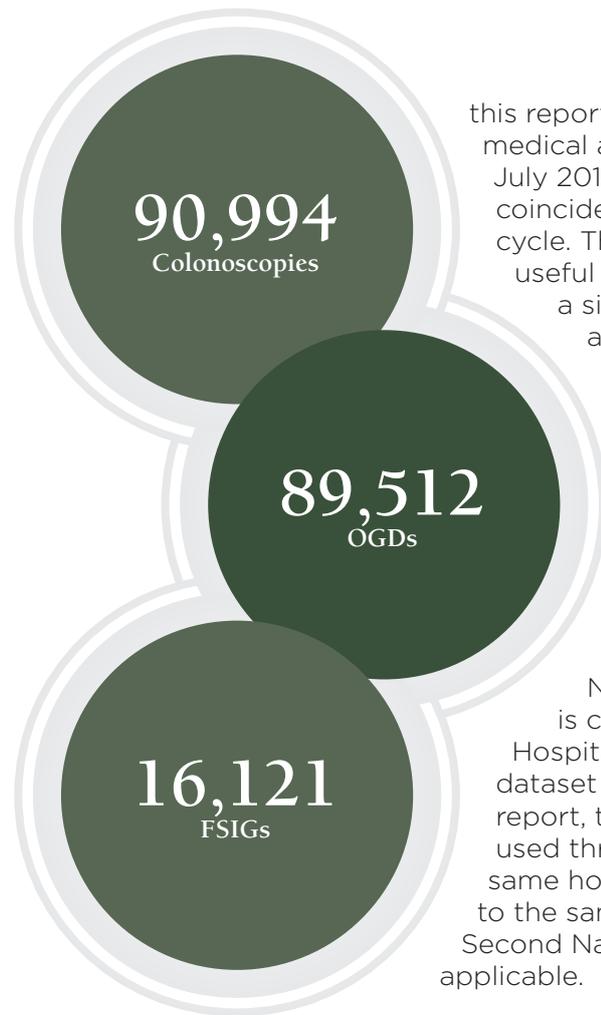
Staff from GI Endoscopy units recorded data regarding clinical details for each procedure performed on an ERS. Anonymised data was then uploaded from each ERS to the central data repository, National Quality Assurance Information System for Endoscopy (NQAIS - Endoscopy), for annual reporting and analysis by trained staff.

This data was recorded in each of the 39 hospitals which were contributing data to the National GI Endoscopy QI Programme for 2017/2018. These hospitals include 31 public hospitals and 8 private hospitals, and provide the entire data population for

39  
Hospitals

670  
Endoscopists

196,627  
Procedures



this report. The reporting period follows the medical academic year (7th July 2017 to 8th July 2018), ensuring that the data collected coincides with the annual medical training cycle. The programme believes it is most useful and coherent to provide statistics on a single cohort of Endoscopists as much as possible.

Data for this report was collected, for oesophagogastroduodenoscopies (OGD) and both screening and symptomatic colonoscopy (COL) procedures, across Key Quality Indicators (KQIs) set out in the Endoscopy QI Guidelines.

No patient identifiable information is collected within NQAIS-Endoscopy. Hospital identifiable data in the national dataset is anonymised. When reading the report, the same hospital identifier has been used throughout (e.g. Hospital 1 refers to the same hospital throughout) and corresponds to the same Hospital ID used in the First and Second National Data Reports where applicable.

## SUMMARY POINTS

- 1 Details of **196,627** Colonoscopies, OGDs, and Flexible Sigmoidoscopies performed in the 2017/2018 training year were captured by NQAIS-Endoscopy.
- 2 **31 Public** and **8 Private Hospitals** submitted data for the 2017/2018 year.
- 3 There remains a large proportion of Endoscopists performing **low numbers of procedures**.
- 4 National Caecal Intubation has **increased** and is now at **93.1%**.

## DATA ANALYSIS

The data coverage for this report is 99.2%. As not every hospital has submitted a full year's data **this report should not be used to directly compare hospital performance**. The information presented in this report is intended to act as a flag, with each unit confirming any potential issues using their own local data.

This data was compared against target for KQIs as set out in the National GI Endoscopy QI Guidelines, available at: <https://www.rcpi.ie/quality-improvement-programmes/gastrointestinal-endoscopy>.

All targets are on a per Endoscopist basis. The analysis contained within this report reflects this wherever possible. For many KQIs, national and hospital level statistics are also presented.

All KQIs are calculated on a combined Endoscopist 1 and Endoscopist 2 basis. This means that Endoscopists statistics will take into account all cases where the Endoscopist was listed as an Endoscopist 1 or an Endoscopist 2 in their local Endoscopy Reporting System. Definitions of Endoscopist 1 and Endoscopist 2 can be found on page 10. The anonymised information illustrated in this report is reflective of the data submitted to NQAIS- Endoscopy.

## APPROVAL PROCESS

This report has been drafted by the EQI Programme and then approved by the Specialty Quality Improvement Programmes Steering Committee and the Conjoint Board of RCPI and RCSI.

**5 65%** of Endoscopists are meeting the **Comfort Score target of 80%** of colonoscopies having a comfort score of a 1 or a 2.

**7** 2nd part intubation rate has continued to **improve to 96.4%**, reflecting a continued increase in data quality.

**6 20 out of 39** hospitals have recorded meeting the Bowel Preparation target.

**8** There is opportunity to improve practice by **reducing the amount of sedation** administered to patients over 70.



## VOLUME OF ENDOSCOPIC PROCEDURES

Evidence suggests that there is a strong correlation between the number of procedures performed by an Endoscopist and their ability to meet Key Quality Indicator targets. As such it is recommended that Endoscopists should perform a high number of procedures in order to keep their skills at a high level.

It is important to note that:

- ➔ Low numbers are likely to be (but not always) associated with poor performance.
- ➔ Low numbers mean the sample size for Key Quality Indicators (KQIs) is low and the confidence intervals around the observed performance will be wide.

Technically excellent Endoscopists will find it easier to maintain adequate skills with low numbers. An average or poor performer will not be able to maintain adequate performance with low numbers.

**Key Quality Data**

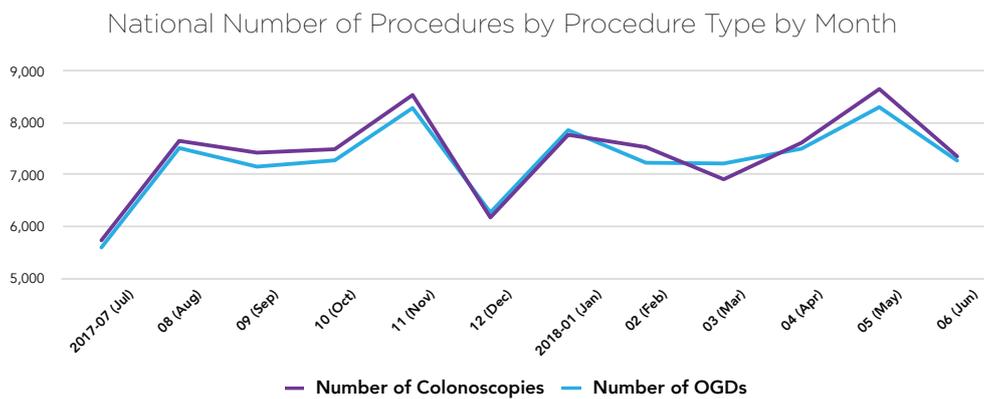
- ➔ Number of OGD procedures performed by each Endoscopist
- ➔ Number of Flexible Sigmoidoscopy procedures performed by each Endoscopist
- ➔ Number of Colonoscopy procedures performed by each Endoscopist

**Key Recommendation**

- ➔ Endoscopists should endeavour to keep their number of procedures high in order to keep their skills at proficient levels.
- ➔ The annual number of procedures performed by each Endoscopist should be reviewed collectively in the endoscopy unit with the designated clinical lead for the service

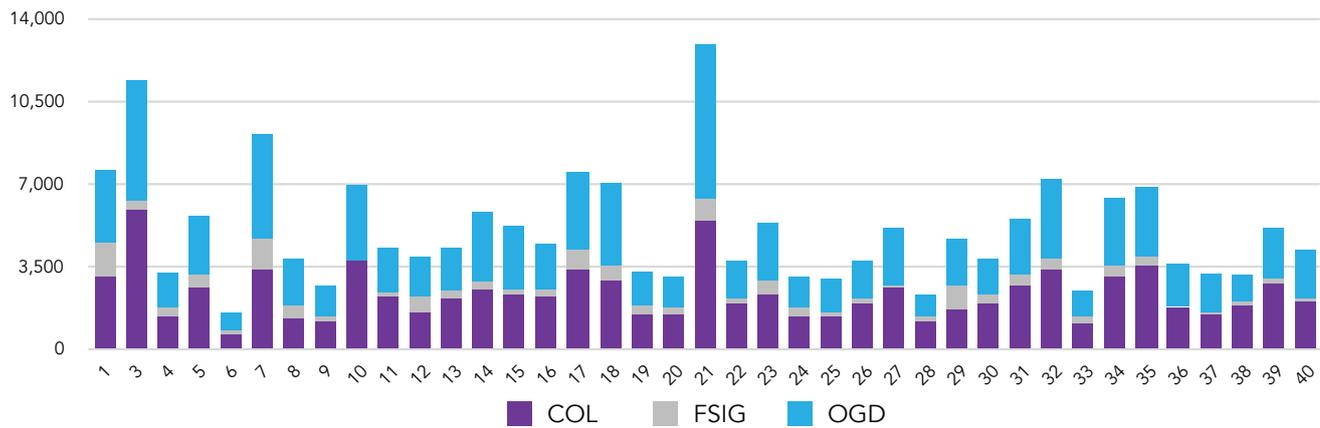
OGDs						
Number of OGDs	<10	11-50	51-100	101-150	>150	Total
Number of Endoscopists	106	141	92	75	245	<b>658</b>

Colonoscopies						
Number of COLs	<10	11-50	51-100	101-150	>150	Total
Number of Endoscopists	83	135	89	65	258	<b>630</b>



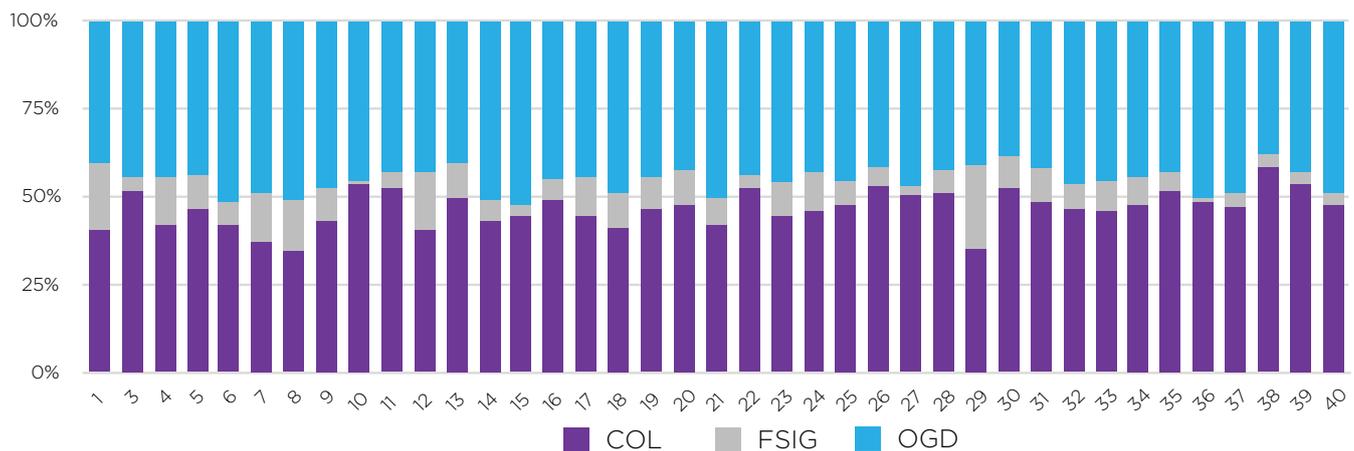
**Figure 1:** This graph illustrates the number of Endoscopic procedures performed nationwide per month between July 2017 and June 2018. July 2018 is not included in the graph above as the data collected included only 1 week of numbers (until July 9th).

Volume of Each Procedure Type by Hospital (07/07/2017 - 08/07/2018)



**Figure 2:** The above bar chart shows the number of procedures performed by each hospital that submitted data to NQAIS-Endoscopy in the 2017-2018 year across three procedure types: Colonoscopy (purple), Flexible Sigmoidoscopy (grey), and OGD (blue).

Percentage of Each Procedure Type by Hospital (07/07/2017 - 08/07/2018)



**Figure 3:** This 100% bar chart presents the information shown in Figure 2 as percentages of the total procedures carried out in that hospital. E.g. Colonoscopies accounted for 40% of the procedures performed in hospital 1.

The data within NQAIS-Endoscopy reflects clinical details from all colonoscopies, OGDs and Flexible Sigmoidoscopies (FSIGs) from 39 public and private hospitals for the 2017/2018 training year.

There is a varying proportion of FSIGs being performed throughout the country. It is suspected that the higher levels of FSIGs may correlate to the training hospitals. An increase in the utilisation of FSIGs presents an opportunity for hospitals to remove unnecessary colonoscopies, which would have the potential to reduce waiting lists.

Given the similar numbers of OGDs and Colonoscopies, there remains an opportunity to triage OGDs in environments where waiting lists are lengthy.



## Recommendation

By increasing the proportion of Flexible Sigmoidoscopies relative to Colonoscopies, hospitals have the ability to improve waiting times

### VOLUME OF PROCEDURES FOR ENDOSCOPIST ONES

The figures presented in Table 2 show the number of colonoscopies performed by Endoscopists as either Endoscopist 1 or Endoscopist 2. As there is a large proportion of Endoscopists with less than 50 cases performed (35%), it is worth further investigation to ascertain more details of this cohort.

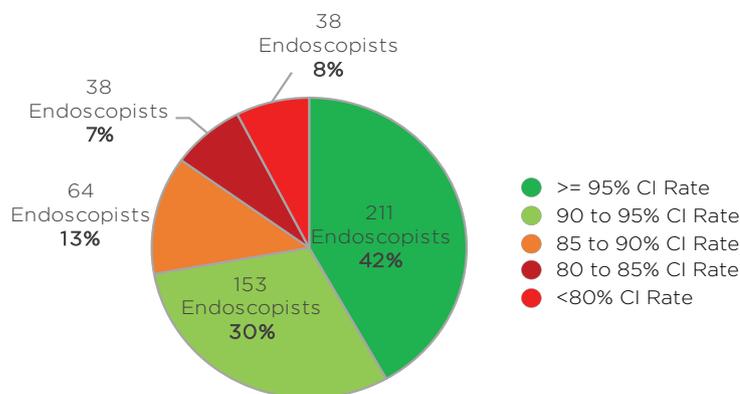
Although we do not currently have the ability to analyse the data on a “Trainee” basis, it is worth looking at the figures for cases performed by an Endoscopist 1 only. This has the ability to act as a proxy for cases performed by a non-Trainee as it is unlikely that a Trainee would be performing without an Endoscopist 2 present.

Number of Endoscopist 1s per colonoscopy amount category						
Number of Colonoscopies	<10	10 to 50	50 to 100	100 to 150	>150	Total
Number of Endoscopist 1s	98	100	70	52	184	504

The table above shows the number of Endoscopists who performed an unaccompanied colonoscopy as Endoscopist 1 (without an Endoscopist 2 present) by the number of colonoscopies they performed. The table shows that a higher proportion of the E1 only cohort perform less than 50 procedures, (39%).

The Caecal Intubation Rate (CI Rate) categories for this cohort is reflective of the overall CI Rate composition outlined on page 13, with 72% of Endoscopist 1s meeting the CI Rate target, in comparison to 71% for all Endoscopists

CI Rate Categories for E1s where no E2 was present



**Figure 4:** This chart shows the Caecal Intubation Rate category for each Endoscopist 1 (without an Endoscopist 2) in relation to the amount of colonoscopies performed as Endoscopist 1.



# COLONOSCOPY KEY QUALITY AREAS

## COLONOSCOPY - CAECAL INTUBATION RATE

Caecal intubation Rate (CI Rate) is one of the main Key Quality Indicators of colonoscopy.

Photographic evidence of Caecal Intubation should always be obtained. It is strongly recommended that hospitals regularly audit that photographs are obtained. They should also audit the images for quality and that they indicate that the anatomical point recorded was indeed reached.

### Key Quality Data

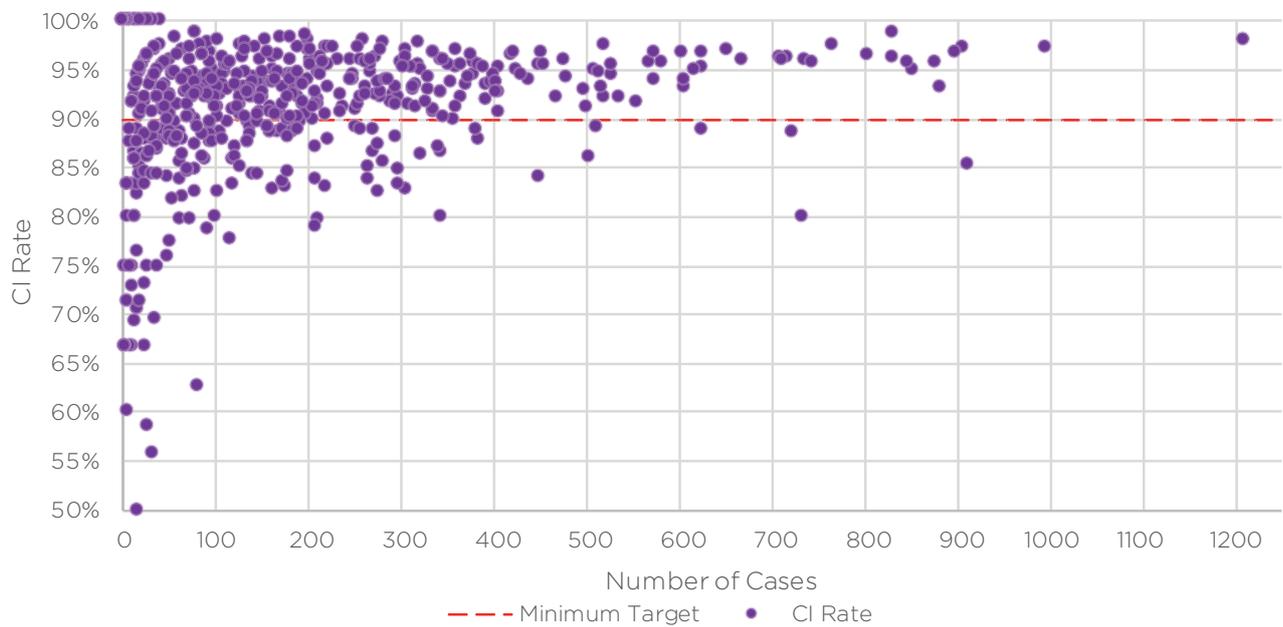
- ➔ Number of colonoscopies where the terminal ileum / caecum / anastomosis has been reached expressed as a % of total colonoscopies per Endoscopist

**Key Quality Data**

- ➔ Minimum Target: 90% of colonoscopy cases should reach the terminal ileum/caecum or anastomosis (adjusted only for obstructing lesions)
- ➔ Achievable Target: 95% of colonoscopy cases should reach the terminal ileum/caecum or anastomosis (adjusted only for obstructing lesions)
- ➔ Clear photographic evidence of the terminal ileum/caecum/anastomosis must be obtained

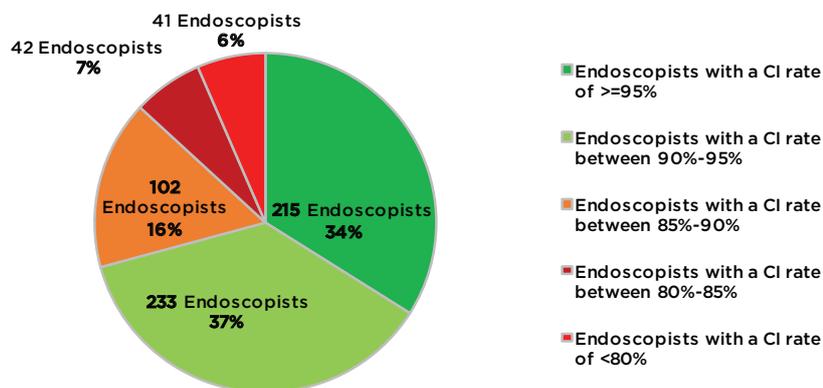
An Endoscopist's CI Rate is calculated based on the number of times caecum was intubated as Endoscopist 1 or Endoscopist 2 as a percentage of the total amount of colonoscopies performed as Endoscopist 1 or Endoscopist 2. Definitions for Endoscopist 1 and Endoscopist 2 can be found on page 13.

Colonoscopy - Endoscopists by CI Rate and Case Amount



**Figure 5:** The chart above shows the Caecal Intubation rate for each Endoscopist per month between July 2017 and July 2018 in relation to the amount of colonoscopies performed as Endoscopist 1 or 2 against the minimum target (90%).

Colonoscopy - Percentage and Number of Endoscopists by CI Rate Category (E1 or E2)



**Figure 6:** This pie chart shows the number and percentage of Endoscopists meeting minimum and achievable targets nationwide.

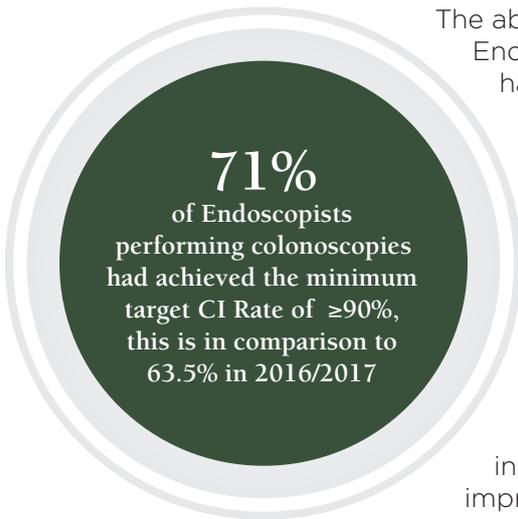
## Definitions

**Endoscopist 1 (E1):**

The clinician who performs the majority of the procedure.

**Endoscopist 2 (E2):**

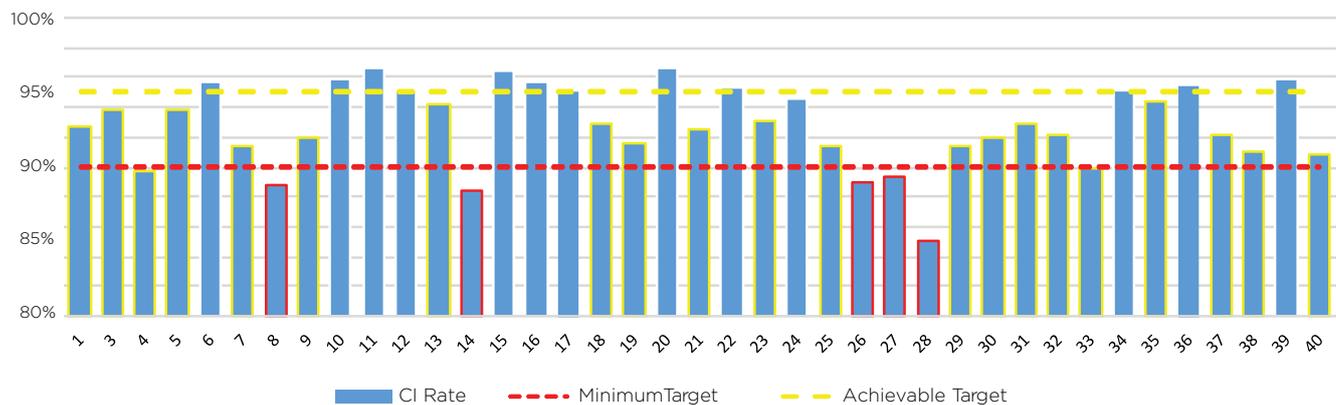
A clinician present in the procedure room during the course of the procedure and who also provides some support to the primary Endoscopist (verbal or physical).



The above pie chart illustrates that a growing number of Endoscopists are meeting their CI Rate target. This cohort has increased by 7.5% since the 2nd National Data Report in 2016/2017. This increase in Endoscopists meeting target is accompanied by a decrease in both the number and percentage of Endoscopists who are achieving  $< 80\%$  CI Rate.

As mentioned previously in this report, we are currently unable to delve further into the makeup of each of the CI Rate categories as information regarding Trainee or consultant status is currently not collected by the Endoscopy Reporting Systems and is therefore not included in the data collected in NQAIS-Endoscopy. This is an area where an improvement could be made in the near future.

Colonoscopy - Caecal Intubation Rate by Hospital (July 2017 - July 2018)



**Figure 7:** Illustrates the Caecal Intubation (CI) Rate for all colonoscopy cases performed in each participating hospital in relation to the minimum and achievable targets.

34 out of 39 hospitals achieved the minimum target of  $\geq 90\%$  for the 2017/2018 year. This represents 87% of hospitals, in comparison to 31 out of 36 (86%) for the previous year. 13 of the hospitals had exceeded the achievable target of  $\geq 90\%$ .

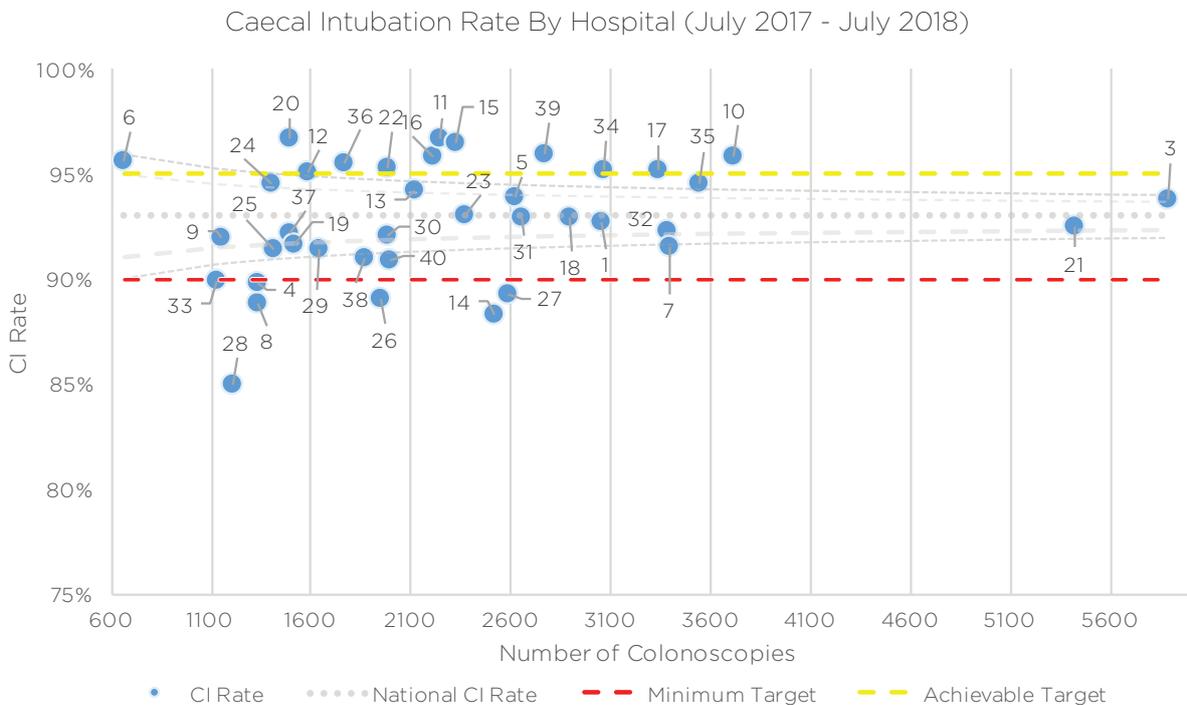
**Moving from Bar Charts to Funnel Plots:**

In the 1st and 2nd National Data Reports hospital level information was presented via bar charts (as in Figure 7). This report will move away from this method towards the use of Funnel Plots presented on the following page. The presentation of the same data in this way allows for further context to be added to each KQI by taking into account the case load of each unit.

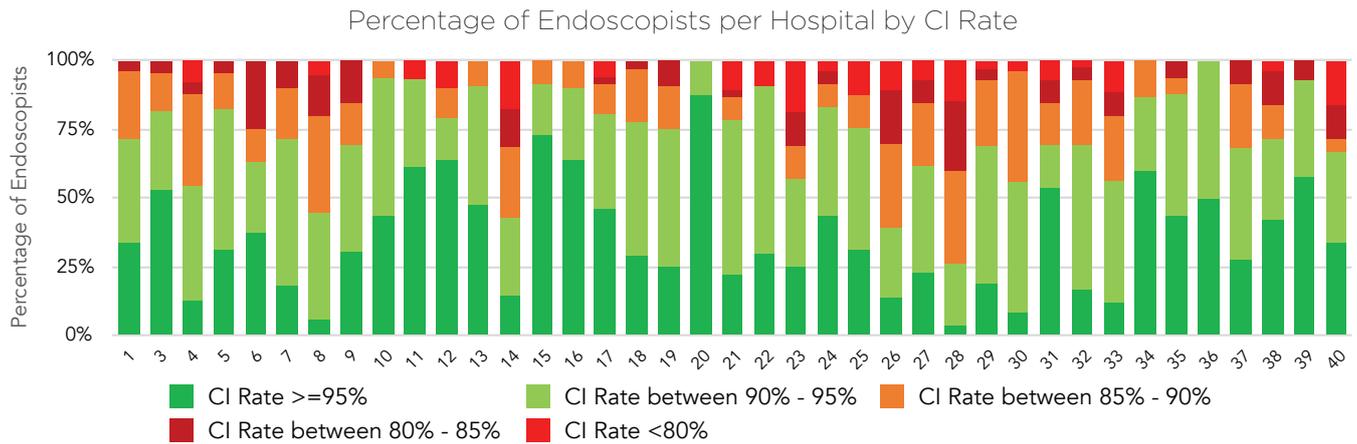
These funnel plots will essentially act as scatter plots with further information on the average and standard error. Traditionally funnel plots contain the vast majority of instances within the upper and lower limits, which is not the case for many graphs in this report. Although not providing the same statistical analysis as a traditional funnel plot, the EQI Programme believes these plots provide a context to the data which is beneficial.

The funnel plot graph below (Figure 8) shows each hospital represented by a blue dot. The Y-axis in this instance represents the CI Rate achieved by hospitals and the X-axis shows us the number of colonoscopies performed. This graph shows us the same information as Figure 7 but combines it with the information presented in Figure 2, providing further context for the information.

For example, the graph below shows that hospital 3 has the highest case load and a CI Rate of 94%, which is just over the national average (dotted grey line) and just below the achievable target rate of  $\geq 95\%$



**Figure 8:** The chart above shows the Caecal Intubation rate for each hospital between July 2017 and July 2018 in relation to the amount of colonoscopies performed per unit against the minimum target (90%) and the achievable target (95%).



**Figure 9:** This 100% bar chart shows the percentage of Endoscopists, who have performed a colonoscopy in the 2017/2018 training year, in each hospital by their CI Rate Category. The CI Rate Category is determined by the Endoscopists national CI Rate across all hospitals they have worked in and is not confined to procedures performed in each hospital. E.g. 50% of Endoscopists in Hospital 36 had a national CI Rate between 95% & 100%.

Nationally, over 93% of colonoscopy cases reach the terminal ileum, caecum or anastomosis. Endoscopists who perform greater volumes of colonoscopies are more likely to meet the target. 80% of all colonoscopy procedures are performed by Endoscopists who have met the target

Figure 9 shows the percentage of Endoscopists per hospital by their national CI Rate. It is the opinion of the Working Group that the fluctuation in percentages of Endoscopists with low CI Rates could be correlated to those units which are providing training.

It would therefore be expected that training hospitals would have a higher proportion of Endoscopists with low CI Rates in comparison to public hospitals without trainees and private hospitals.

Data collected in NQAIS-Endoscopy, supported by international evidence, suggests that Endoscopists who performed greater number of procedures are able to maintain their skills more easily than those with low levels of procedures. The information presented in Figure 5 illustrates that this is the case as those with higher procedure amounts are reaching the target more regularly.

Inversely, low volumes of procedures increase the difficulty in maintaining skill levels and are therefore associated with poor performance.

As data is currently limited, in terms of the ability to identify what types of Endoscopists are performing these low numbers of procedures, we have no concrete way of analysing Trainee only statistics and whether they are improving throughout the year. However, this information is available locally.

In general, the number of Endoscopists meeting the minimum and achievable target is improving. This is also reflected by the national Caecal Intubation rate, and the decrease in the number of Endoscopists performing low volumes. However it is evident that there is variation in units across the country.



## Recommendation

*In order to increase CI Rates, Endoscopists should endeavour to keep their number of procedures high in order to maintain their skills at proficient levels.*

## COLONOSCOPY - COMFORT SCORE

Comfort is a key recommendation and central to any patient centred QI programme in GI Endoscopy. It is proposed to measure a comfort score for each procedure using the modified Gloucester Scale as shown on page 19.

Comfort Score rate is calculated by expressing the number of colonoscopies performed with a Comfort Score of 1 or 2 as a percentage of the total number of colonoscopies performed by an Endoscopist (Endoscopist 1 only) or hospital. Comfort Score should be provided by a third party and agreed with the Endoscopist before submission.

**Key Quality Data**

- ➔ **Median** comfort level score per Endoscopist

**Key Recommendation**

- ➔ Use the modified Gloucester scale
- ➔ Comfort scores should be assessed by a third party who will usually be an endoscopy nurse and agreed with the Endoscopist before recording

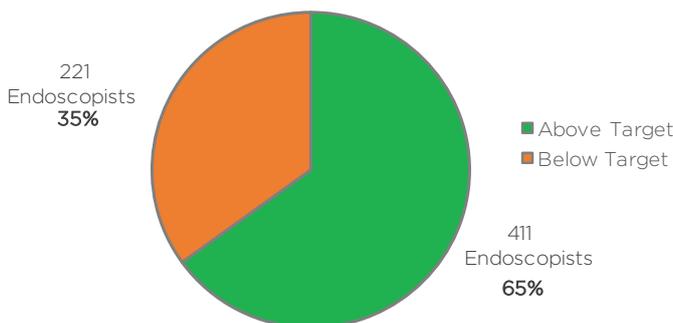
**Key Recommendation**

- ➔ 80% of colonoscopy cases should have a comfort score of a 1 or 2

Gloucester Scale

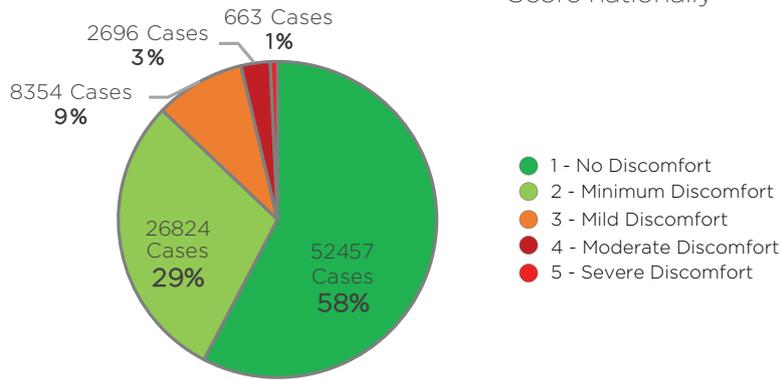


Colonoscopy - Percentage and Number of Endoscopists Above and Below Comfort Score Target



**Figure 10:** This pie chart shows the number of Endoscopists meeting the Comfort Score target nationwide. In order to meet this target an Endoscopist must have recorded a score of 1 or 2 (using the Gloucester 1-5 scale) for at least 80% of the colonoscopies they performed that year.

Colonoscopy - Percentage and Number of Cases by Comfort Score nationally



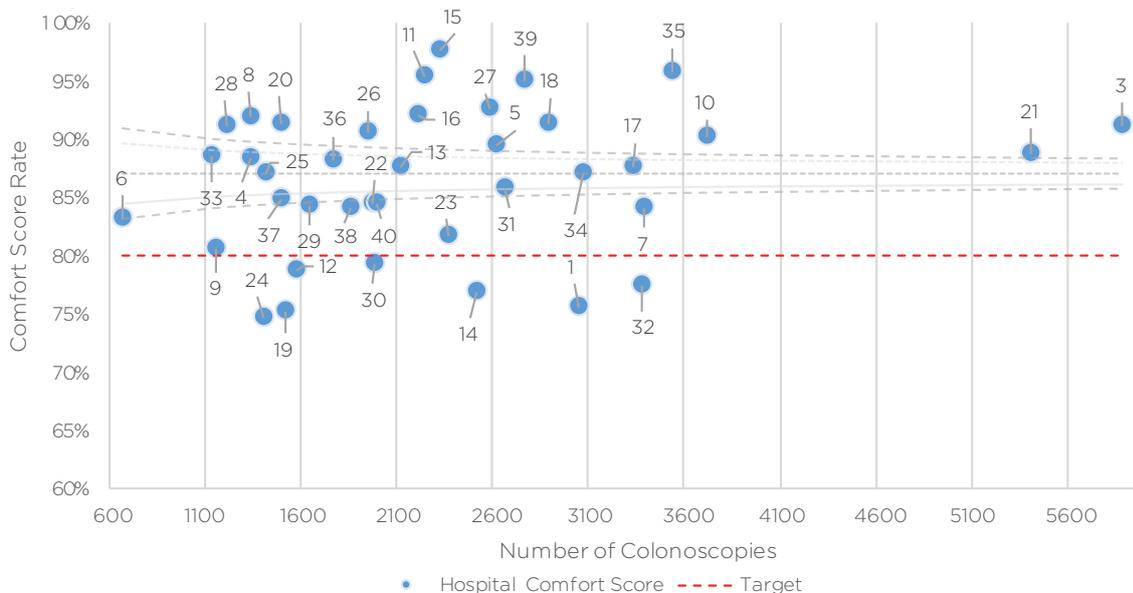
**Figure 11:** This pie chart shows the number of colonoscopies performed per comfort score rating nationwide for the 2017/2018 training year.

58% of colonoscopies are performed with no discomfort, this represents an increase of 3% on last year. Less than 1% of all cases are performed with severe discomfort.

Overall the data for comfort scores seems to be mature and consistent. The rate of Endoscopists meeting the target has increased slightly from 64% to 65%, showing a small improvement when compared to last year's figures.

**A large majority of colonoscopies are performed nationally with no or minimal discomfort at 87%. This represents 2% increase on the figure in last year's National Data Report, 85%.**

Colonoscopy - Comfort Score by Hospital (July 2017 - July 2018)



**Figure 12:** The chart above shows the percentage of colonoscopies in each unit receiving a comfort score of a 1 or a 2 between July 2017 and July 2018. This is shown on the Y-axis with the X-axis showing the number of colonoscopies performed. The funnel plot shows this KQI against the national average (grey line) and QI Target (red dotted line) of  $\geq 80\%$ .

The 2017-2018 data reflects a similar pattern to the 2016-2017 year with many of the units who did not achieve the target being the same in both years.

As this KQI is recorded subjectively, it is possible that there is variation in recording practices between units.

### Recommendation

*The EQI Programme recommends that Endoscopy Units standardise recording practices using the Gloucester Scale shown on the previous page. It is also recommended that the practice of deciding a comfort score should be assessed by a third party, usually an endoscopy nurse, and agreed with the Endoscopist before recording*

### COLONOSCOPY – POLYP DETECTION RATE

Internationally accepted guidelines on performance indicators of colonoscopy recommend monitoring direct or proxy markers of detection of suspicious lesions including polyps, adenomas or withdrawal times. As a result of the difficulty of linking Endoscopy Reporting Systems with Histology, at this time, the EQI Programme measures Polyp Detection Rates rather than measuring direct adenoma detection rates.

#### Key Quality Data

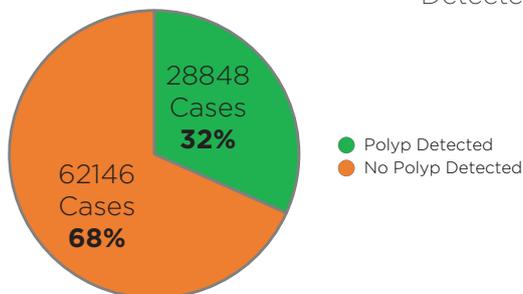
➡ Colonoscopies with polyps detected expressed as a % of total colonoscopies per Endoscopist

#### Key Recommendation

➡ 20% of all colonoscopies have a polyp(s) detected

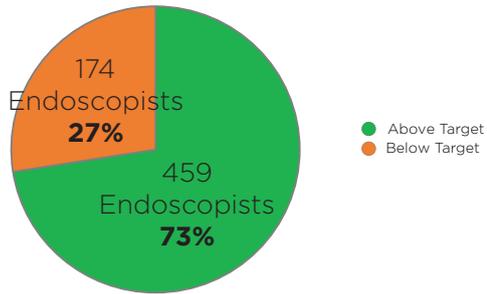
*The 2017/2018 national Polyp Detection rate is 32%, up 2% from last year.*

Colonoscopy - Percentage and Number of Cases where Polyp Was Detected



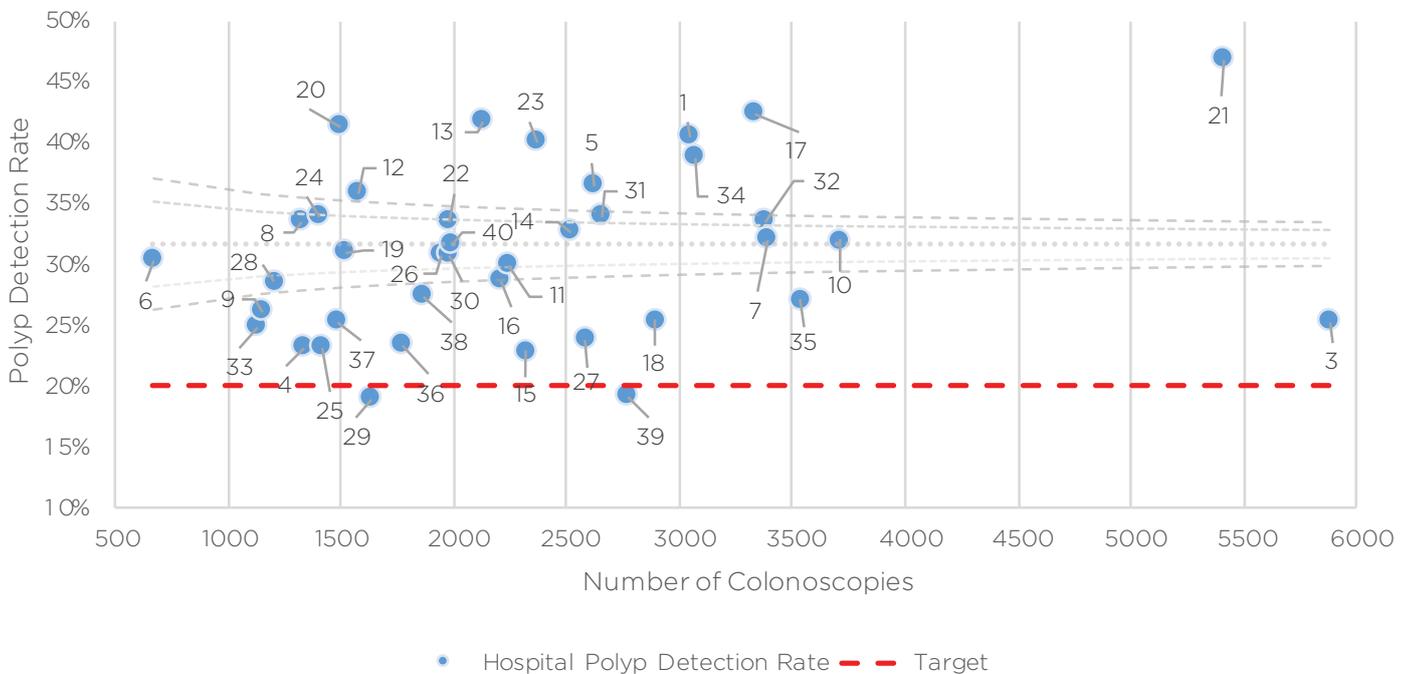
**Figure 13:** The above pie chart presents the number of colonoscopies where a polyp was detected nationwide for the 2016/2017 year.

Colonoscopy - Number and Percentage of Endoscopists Above and Below Polyp Detection Target



**Figure 14:** This pie chart shows the number of Endoscopists nationwide meeting the Polyp Detection Rate target of  $\geq 20\%$ .

Polyp Detection Rate by Hospital (July 2017 - July 2018)



**Figure 15:** The Funnel Plot above shows the Polyp Detection rate for each hospital the 2017/2018 training year against the target of  $\geq 20\%$  of colonoscopies with at least one polyp detected. The Polyp Detection Rate is shown on the Y-Axis, with the number of colonoscopies performed in the unit on the X-axis.

The increase in national Polyp Detection rate is reflected in the drop in the number of units not achieving the target ( $\geq 20\%$  of colonoscopies with at least one polyp detected) from 4 units in 2016/2017 to 1 unit in 2017/2018.

Although most units are above target for this KQI, we can still see wide variation between Polyp Detection rates. It is the Working Groups opinion that this may reflect the difference between screening and non-screening centres, public and private units, as well as population differences.



## COLONOSCOPY – BOWEL PREPARATION

Effective bowel preparation is critical to ensure a detailed visual examination of the bowel. To date no single bowel preparation for colonoscopy has emerged as consistently superior over another. Good bowel preparation supports improved polyp detection and Caecal intubation. Poor bowel preparation is associated with failure to reach the caecum and hinders the detection of lesions.

### Key Quality Data

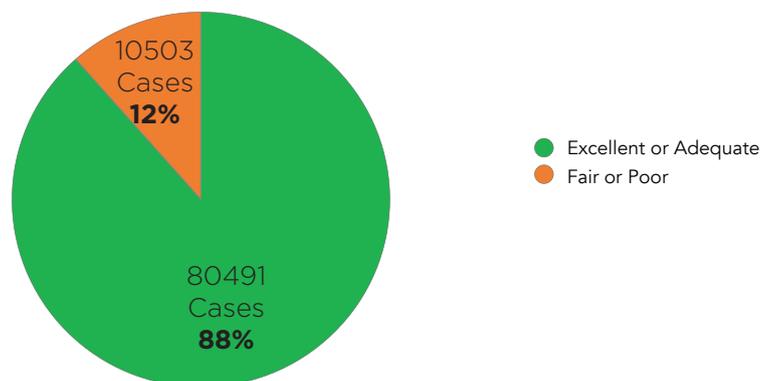
➡ Record the bowel preparation for each colonoscopy. Express the total number of colonoscopies with Adequate and Excellent scores as a % of all colonoscopies

### Key Quality Target

➡ Bowel preparation described as excellent or adequate in  $\geq 90\%$  of colonoscopies

Bowel Preparation statistics have largely remained static, with 88% of cases receiving a bowel preparation score of Excellent or Adequate both this year and last year. A large number of units have not achieved the minimum target rate for this KPI, and there appears to be a correlation between these units and those who did not achieve the minimum target last year. Due to this, it is the EQI Programme's opinion that this may reflect variation between units on how bowel preparation is interpreted and recorded.

Colonoscopy - Percentage and Number of cases by Bowel Prep Score



**Figure 16:** The above pie chart illustrates the number of colonoscopies that received a Bowel Prep score of "Excellent" or "Adequate" nationwide.

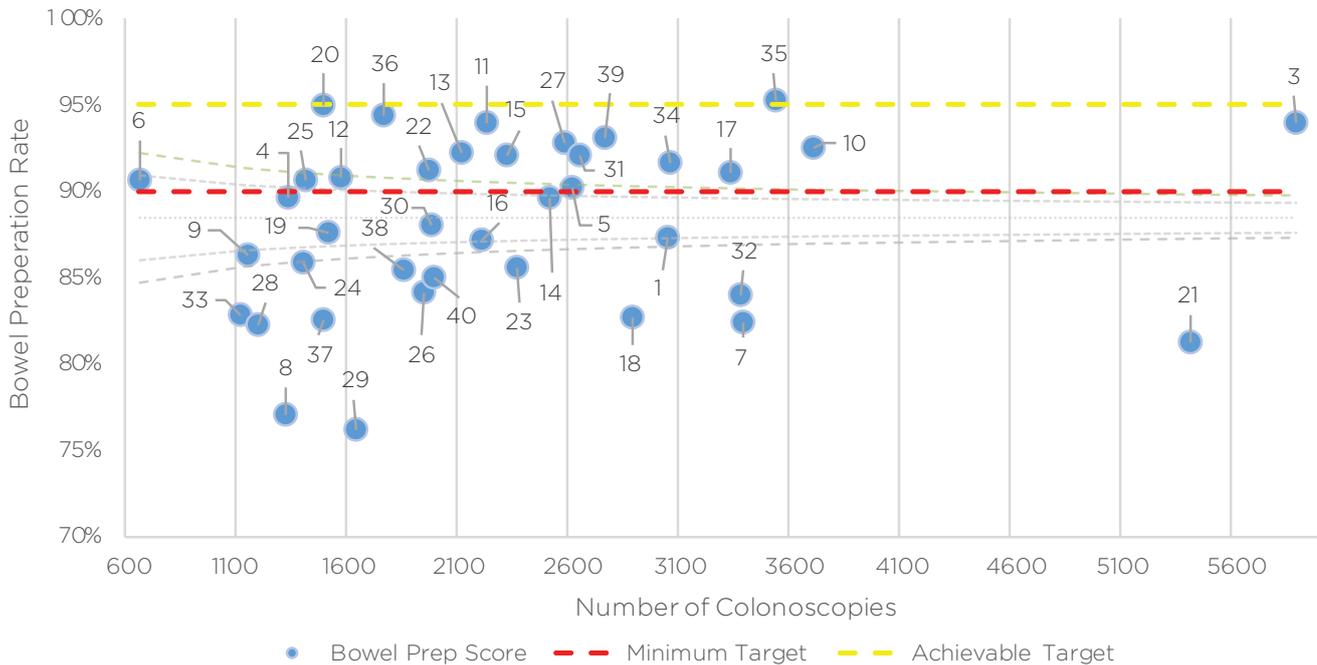
Excellent	Adequate	Complete despite poor prep	Failed due to poor prep
No or minimal solid stool and only clear fluid requiring suction	Collections of semi-solid debris that are cleared with washing/suction	Solid or semi-solid debris that cannot be cleared effectively but which still permits intubation to caecum	Solid debris that cannot be cleared effectively and prevents intubation to caecum.



## Recommendation

*It is the EQI Programme's recommendation that units adhere to the definitions of bowel preparation as set out here. The main differentiating factor between Excellent/Adequate and the others should be whether the bowel preparation was satisfactory for the intended colonoscopic assessment or not.*

Bowel Preparation Rates by Hospital  
(July 2017 - July 2018)



**Figure 17:** The Funnel Plot above shows the Bowel Preparation rate for each hospital in the 2017/2018 training year against the minimum target of  $\geq 90\%$  of colonoscopies with bowel preparation as Excellent or Adequate, and the achievable target of  $\geq 95\%$ . The Bowel Preparation Rate is shown on the Y-Axis, with the number of colonoscopies performed in the unit on the X-axis.



## OESOPHAGOGASTRODUODENOSCOPY (OGD) KEY QUALITY AREAS

### OGD - DUODENAL SECOND PART INTUBATION

Duodenal Second Part Intubation is an important quality measure of the completeness of a procedure. In order to complete this measure, the endoscope should be passed through the pylorus to examine the first and second parts of the duodenum.

#### Key Quality Data

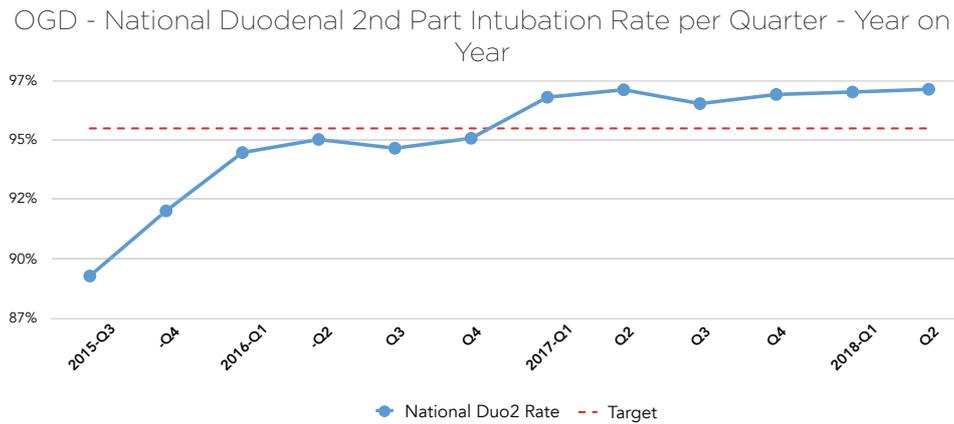
- ➔ Number of cases in which Duodenal 2nd part intubation was achieved expressed as a % of total OGD cases per Endoscopist

#### Key Quality Target

- ➔ Intubation of Duodenum Second Part in  $\geq 95\%$  of cases

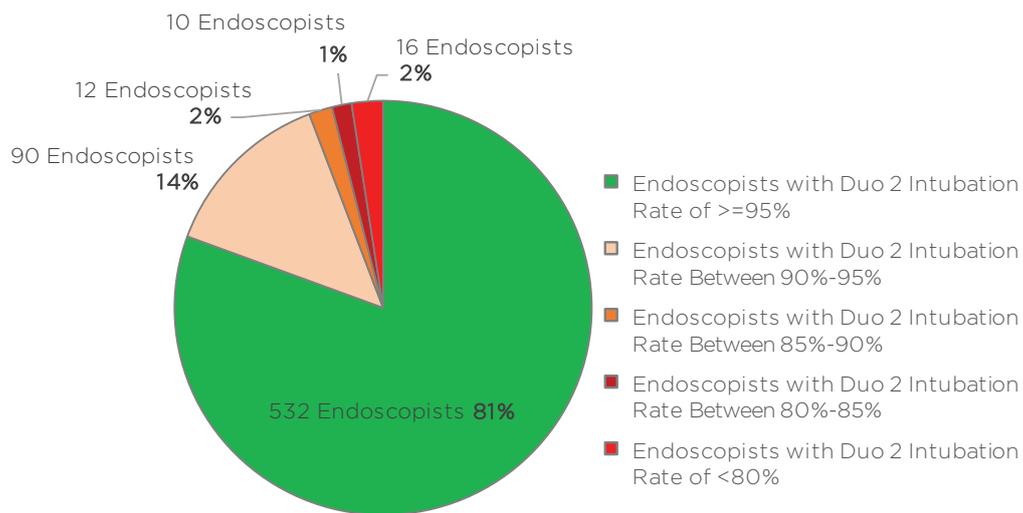
The consistent increase in national 2nd Part Intubation Rates over the past 3 training years suggests a maturing of QI data for this KQI

**96.4%**  
- 2017/2018  
National Average  
Duo 2 Intubation  
Rate



**Figure 18:** This line graph shows the national percentage of cases in which duodenal 2nd part intubation was achieved over the three training years up to July 2017/2018, by quarter.

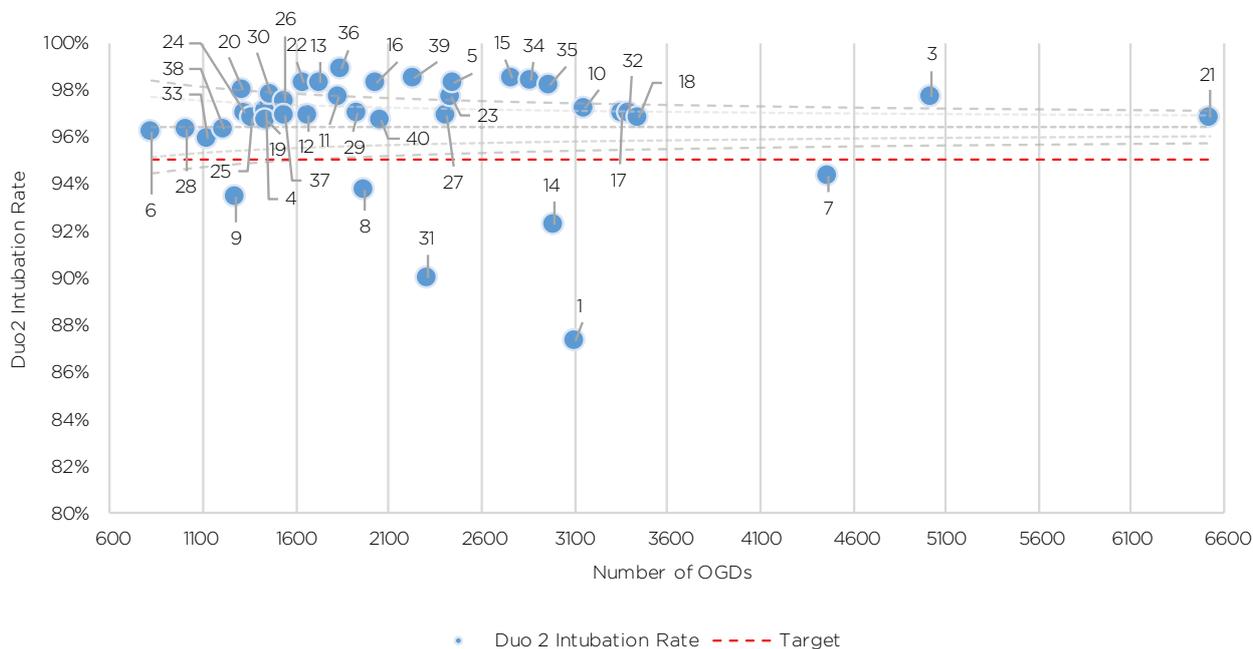
OGD - Percentage and Number of Endoscopists by Duodenal 2nd Part Intubation Rate Category



**Figure 19:** This pie chart illustrates the number and percentage of Endoscopists by Duodenal 2nd Part Intubation Rate category. E.g. 532 (81%) of Endoscopists had a Duo 2 Intubation rate greater than or equal to 95%.

Given the nature of 2nd part intubation, the disparity between units who are significantly outside the national average could suggest a data entry or ERS issue. The Working Group has noted that the field to indicate completion is not mandatory in all ERSs, possibly contributing to units being below target.

OGD - Duodenal 2nd Part Intubation by Hospital  
(July 2017 - July 2018)



**Figure 20:** This funnel plot shows the Duo 2 Intubation Rate per hospital in comparison to the national average (grey dotted line) and the target set out in the QI guidelines of  $\geq 95\%$  of OGDs with Duodenal 2nd Part Intubation for the 2017/2018 training year.

OGD - RETROFLEXION

Retroflexion, also known as the J manoeuvre, allows for a full view and inspection of the cardia and fundus of the stomach. It is an important quality measure of the completeness of the procedure. Ulcers in the body of the stomach and fundus tend to arouse more clinical suspicion.

Key Quality Data

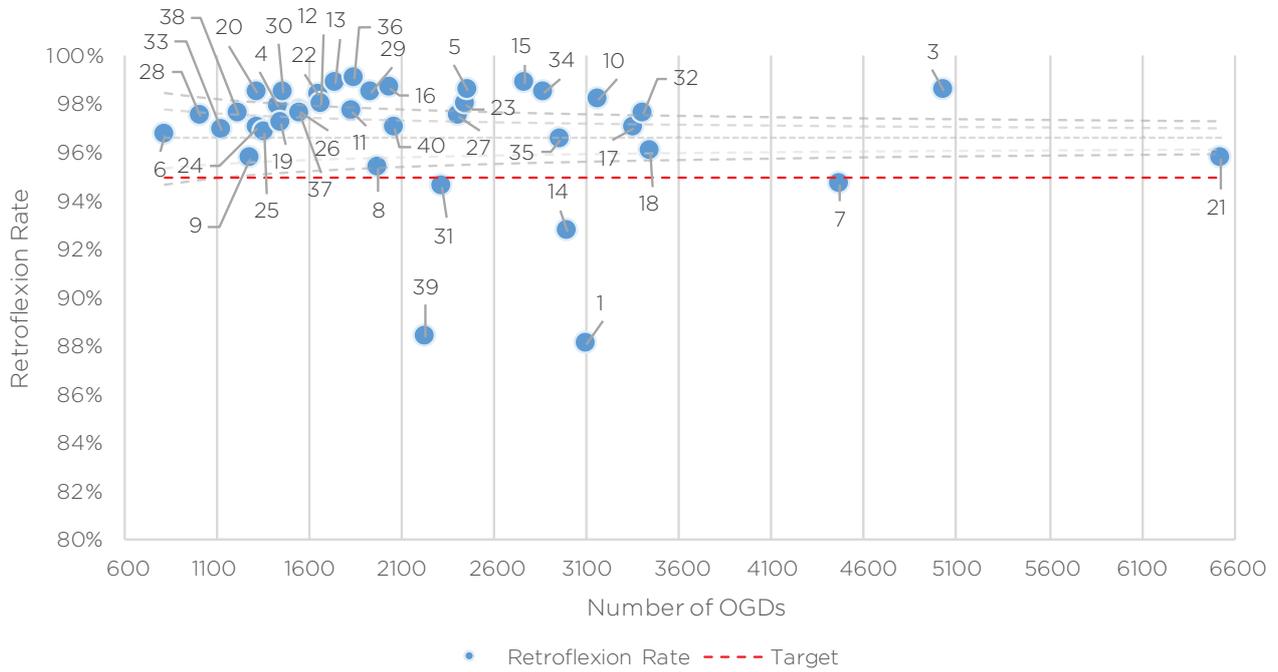
➔ Number of cases in which retroflexion was performed expressed as a % of all OGD cases per endoscopist

Key Recommendation

➔ Retroflexion (J manoeuvre) in stomach to visualise fundus in  $\geq 95\%$  of cases

Similar to Duodenal 2nd Part intubation, it is possible that the variation shown between some unit's retroflexion rates could be due to data entry discrepancies. The EQI Programme recommends that units review their current ERSs to ensure this field is mandatory.

OGD - Retroflexion Rates by Hospital  
(July 2017 - July 2018)



**Figure 21:** This funnel plot shows the Duo 2 Intubation Rate per hospital in comparison to the national average (grey dotted line) and the target set out in the QI guidelines of  $\geq 95\%$  of OGDs with Duodenal 2nd Part Intubation for the 2017/2018 training year.



## SEDATIVES

Many patients tolerate upper endoscopy with only topical anaesthesia of the oropharynx, however some patients may need sedation. Likewise, colonoscopy can be an uncomfortable experience but this discomfort can be reduced by careful patient preparation and sedation. Sedation improves patient tolerance of endoscopy, however, excessive sedation is considered to be an important contributor to cardio-respiratory complications following endoscopy in high risk patients or elderly patients.

### Key Quality Data

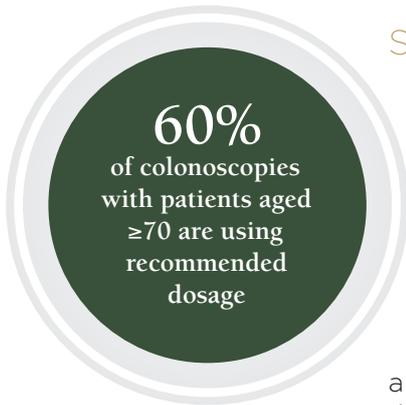
- ➔ Sedative type and quantity used for patients under 70 years of age, and 70 years and over expressed as a median figure per Endoscopist

### Key Recommendations

- ➔ Sedative should be used to achieve conscious sedation; where the patient displays purposeful response to verbal stimulation.
- ➔ The median level of sedation for older patients ( $\geq 70$  years of age) should be approximately half that of patients under that age.
- ➔ The use of reversal agents should be minimised. Its use should require that case be reviewed.

**Key Quality Targets**

- ➔ Median quantity of Midazolam:
  - ≤5mg for patients under 70 years of age
  - ≤3mg for patients 70 years of age and above
- ➔ Fentanyl: ≤100mcg



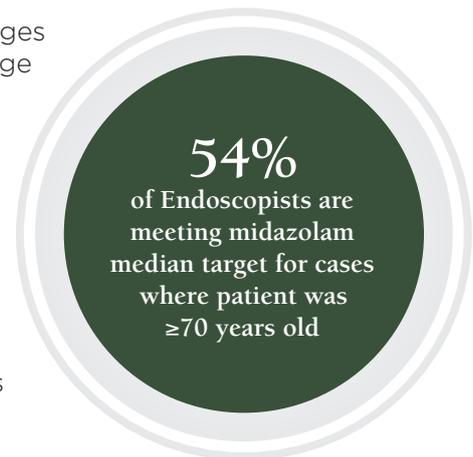
**SEDATIVES - MIDAZOLAM (COLONOSCOPY)**

Overall, for colonoscopy patients less than 70 years old, 86% of cases received the recommended dosage of 5mg midazolam or less.

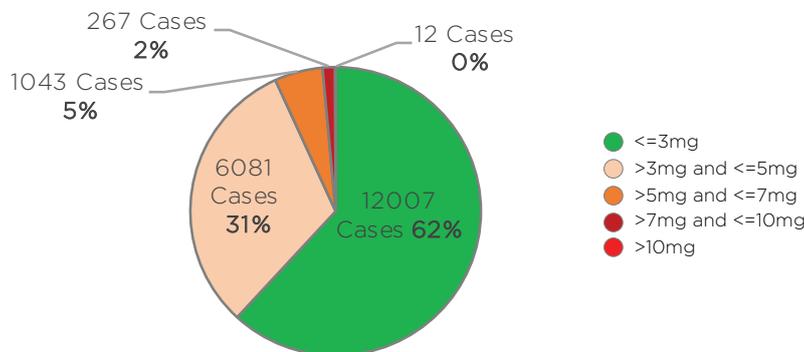
The 2017/2018 data shows similar sedation trends to previous years whereby patients under 70 are by and large receiving the target median dosage of midazolam (≤5mg). However a more substantial proportion of patients over 70 are receiving dosages exceeding the target median for their age category (≤3 mg).

As such, this report will focus specifically on the sedation dosages in relation to patients over 70, as well as sedation dosages in both age categories combined.

It appears that many Endoscopists may be giving the same dosage of midazolam to all patients irrespective of patient age. This continues to present an opportunity to improve practice.

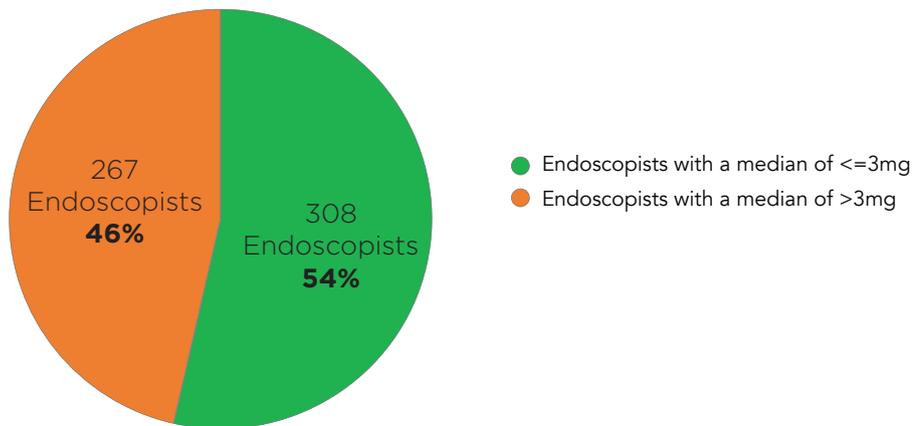


Colonoscopy - Midazolam Dosages in Patients 70 and Older - Number and Percentage of Cases



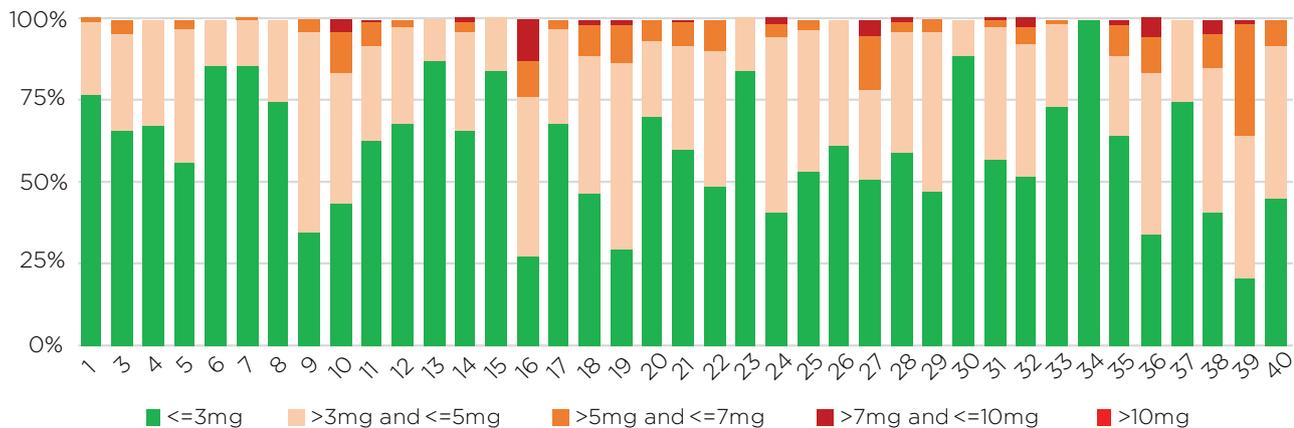
**Figure 22:** The above pie chart shows the midazolam dosages administered to patients aged 70 and older for colonoscopies nationwide. E.g. 62% of colonoscopies in patients 70 and older used ≤3mg of Midazolam.

Colonoscopy - Midazolam Dosages - Endoscopists Above and Below Target (Over 70s)



**Figure 23:** This pie chart shows the number and percentage of Endoscopists who are meeting the target median quantity of Midazolam ( $\leq 3\text{mg}$ ) in colonoscopies where the patient was **70 or older**.

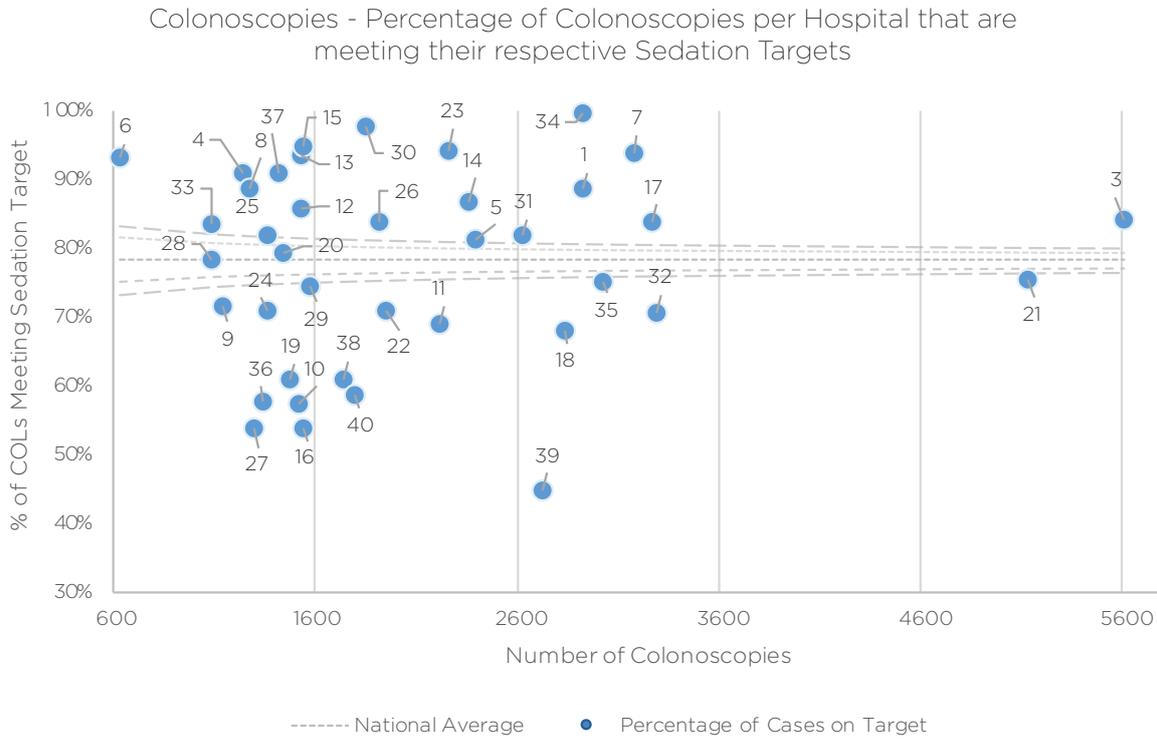
Colonoscopy - Midazolam Dosages in Patients 70 and Older - Percentage of Cases per Hospital  
Endoscopist Target Median:  $\leq 3\text{mg}$



**Figure 24:** This 100% bar chart shows the percentage of colonoscopies, with **patients 70 or older**, by midazolam usage category for each hospital that submitted data in 2017/2018. E.g. Just over 75% of colonoscopies in Hospital 1 used  $\leq 3\text{mg}$  of Midazolam in colonoscopies on patients 70 and older.

### SEDATIVES COMBINED

By combining both age categories, each unit can get a picture of the overall sedation dosages being used in their units. Nationally, the average percentage of colonoscopies receiving the recommended dosage of midazolam is 79%. The funnel plot below illustrates a wide variation in dosages of midazolam being used, ranging from around 40% receiving target dosage to almost 100%.



**Figure 25:** This Funnel Plot shows the percentage of colonoscopies in each hospital that are receiving the target dosage of midazolam regardless of age. E.g. 78% of colonoscopies performed in hospital 28 received the target median of  $\leq 3$ mg for patients over 70, and  $\leq 5$ mg for patients under 70. As a result, this hospital falls on the grey national average line.

### SEDATIVES FOR OVER 70S

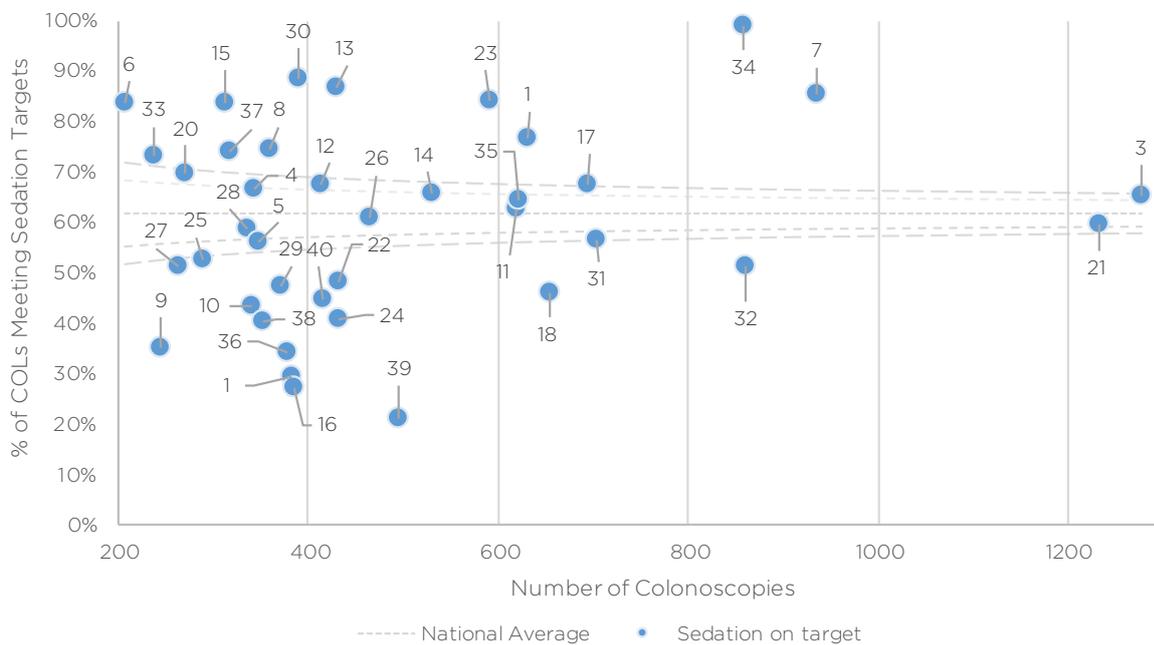
When cases of patients under 70 are removed from the dataset, we see results similar to the combined data. This would further support the idea that the majority of cases which do not achieve their target median are performed on the over 70 group.

The national average for colonoscopies receiving the recommended midazolam dosages for patients over 70 is 62%. This is 17% lower than the average when the age categories are combined.

79%

of all colonoscopies  
are receiving the  
recommended  
midazolam  
dosage

Colonoscopies - Percentage of Colonoscopies per Hospital for patients Over 70 where 3mg Sedation Target is met



**Figure 26:** This Funnel Plot illustrates the percentage of colonoscopies for patients over 70 that have used the target median dosage of  $\leq 3$ mg of midazolam. E.g. 62% of colonoscopies for patients over 70 received the recommended dosage in hospital 26. As a result this hospital falls on the grey national average line.



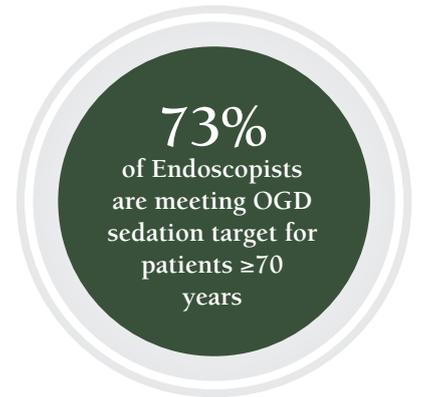
## Recommendation

***In order to address the high sedation usage in the over 70s patient population, it is the opinion of the EQI Programme that lower midazolam concentration options, such as 1mg/ml, should be procured by units in order to facilitate the administration of lower dosages when desired.***

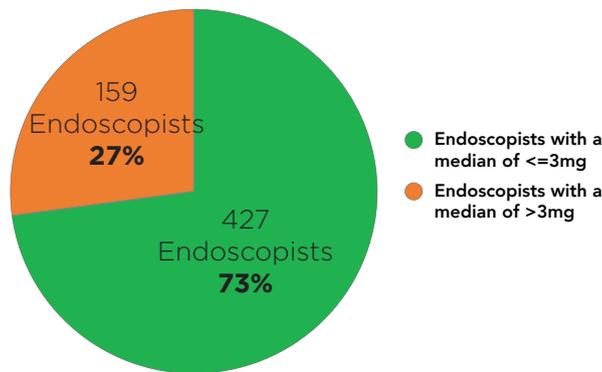
## SEDATIVES – OGD

In OGDs, we see a much higher proportion of Endoscopists meeting target for procedures in both over 70 and under 70 age categories. As shown in Figure 27 below, 73% of Endoscopists performing OGDs are meeting the target median midazolam dosage in patients over the age of 70.

When we look at patients under 70, the number of Endoscopists meeting the sedation target rises to 92%.



OGD - Midazolam - Endoscopists Above and Below Target (Over 70s)



**Figure 27:** This pie chart shows the number and percentage of Endoscopists who are meeting Midazolam target used in **OGDs** where the patient was aged 70 or older (median dosage of ≤3mg).

## SEDATIVES – FENTANYL

Number and Percentage of Cases by Fentanyl Use and Dosage				
Dosage (mcg)	OGD		Colonoscopy	
	Number of Cases	% of Cases	Number of Cases	% of Cases
<b>No Fentanyl Used</b>	68188	76.59%	27365	30.14%
<b>25 or 50</b>	17539	19.70%	41096	45.26%
<b>75 or 100</b>	3256	3.66%	22111	24.35%
<b>125 or 150</b>	16	0.02%	109	0.12%
<b>175 or 200</b>	4	0.00%	50	0.06%
<b>&gt;200</b>	13	0.01%	51	0.06%
<b>Unreliable Data</b>	13	0.01%	24	0.03%

Of those who do receive Fentanyl, the vast majority, 99.75%, receive the recommended Fentanyl dosage of ≤100 mcg.

Data is deemed unreliable if the dosage is recorded in the ERS as less than 1 (e.g. 0.25), or is not a multiple of 25 mcg.



## COMBINED KPI

### PERFORMANCE INDICATOR FOR COLONIC INTUBATION (PICI)

The **P**erformance **I**ndicator for **C**olonic **I**ntubation (PICI) is a KPI that combines Caecal Intubation, Comfort Score, and Sedation dosages in order to create a fuller picture on the overall quality of a scope.

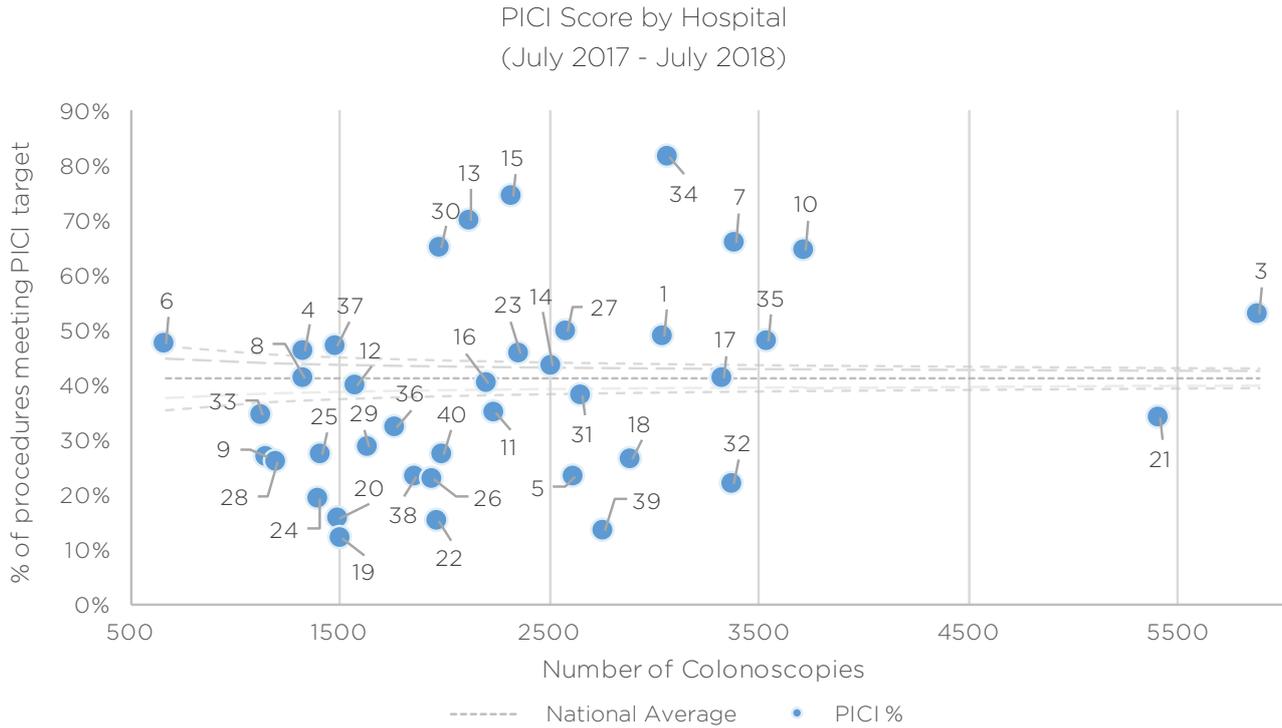
PICI has the ability to provide a simpler KPI for overall quality when compared to 3 separate KPIs. As this is the first time the PICI score has been considered by the EQI Programme, it is intended to act as an interesting stimulant for thought on measuring the quality of colonoscopies.

The PICI score is calculated using the following formula:

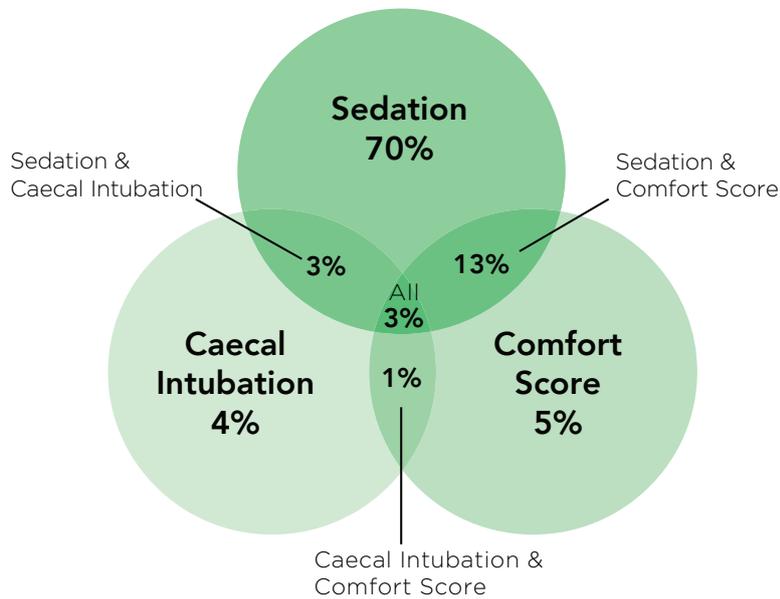
**Procedures with: Caecal Intubation & Comfort Score  $\leq 2$  & Sedation  $\leq 3$ mg**

---

**Total Number of Colonoscopies**



**Figure 28:** This Funnel Plot shows the percentage of colonoscopies in each hospital that meet the PICI standard of Caecal intubation, comfort score  $\leq 2$ , and midazolam dosage of  $\leq 3$ mg. The percentage of cases meeting this standard is shown on the y-axis with the number of colonoscopies on the x-axis.



**Figure 29:** Reasons why PICI score was not achieved

## NOTE ON PICI

The investigation of PICI scores in relation to NQAIS-Endoscopy data was inspired by Dr Roland Valori's paper: *A new composite measure of colonoscopy: the Performance Indicator of Colonic Intubation (PICI), 2018.*\*

This report has utilised slightly different measures for Comfort Score ( $\leq 2$  rather than  $\leq 3$ ) and Sedation ( $\leq 3\text{mg}$  rather than  $\leq 2\text{mg}$ ). This was done in order to maintain continuity of measurements with the QI Guidelines and within this report.

Using individual indicators, it can be difficult to assess the overall quality of a procedure beyond its completeness. For instance, the caecum may be intubated and the comfort score may be good but there could be an unusually high level of sedation used. As such, a composite indicator has the potential to more accurately assess the skill of a scope by requiring low sedation along with Ceecal intubation and comfort score.

However, the EQI Programme recommends this information be used as a stimulant for thought rather than an established KPI as it does not yet cover all aspects of the procedure. For example, it is conceivable that a high dose of fentanyl could be used while achieving all the components needed to reach the PICI score.

Reflecting the statistics presented earlier in the report, sedation is the main reason why a procedure would not fulfil the PICI criteria. Figure 29 illustrates this with 90% of the procedures failing to attain the PICI standard doing so, at least in part, due to sedation dosage. 71% failed due to sedation alone.

\* <https://www.ncbi.nlm.nih.gov/pubmed/28753700>



## KQI SUMMARY— YEAR ON YEAR

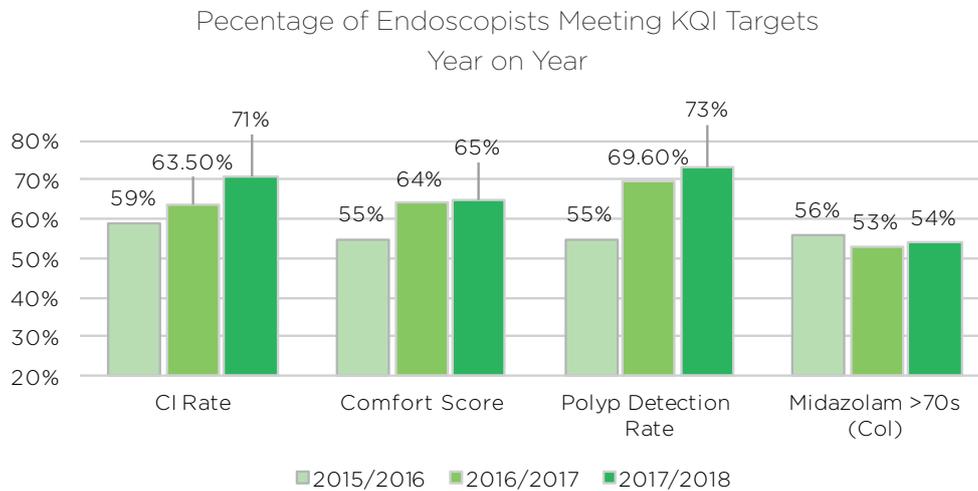
One of the main indicators of quality in GI Endoscopy is the amount of Endoscopists who are meeting the target set out in the GI Endoscopy Quality Improvement Guidelines. With this 3rd National Data Report representing a mature dataset in NQAIS-Endoscopy, it can be informative to track the number of Endoscopists meeting the targets over the past 3 years.

Figure 30 below shows the four KQIs deemed most central to quality over the past 3 years. The percentage of Endoscopists meeting the target for CI Rate, Comfort Score and Polyp Detection Rates has increase each year since 2015.

However, fluctuation is noticeable in the number of Endoscopists meeting the target median for sedation in patients over 70 years old.

Overall, we can see that although the statistics in most areas have progressed positively over the past three years, others have remained

relatively static. With the analysis now in its 3rd cycle, some of these early increases can be attributed to the process of data maturation. Further work is therefore needed to ensure that the numbers meeting KPI targets continue to increase now that we have a matured data set.



**Figure 30:** This bar chart shows the percentage of Endoscopists meeting target for four of the most important KQIs over the previous three years. E.g. 71% of Endoscopists met the CI Rate target in 2017/2018 compared to 63.5% in 2016/2017, and 59% in 2015/2016.

# SUMMARY OF RECOMMENDATIONS

1

By increasing the proportion of Flexible Sigmoidoscopies relative to Colonoscopies, hospitals have the ability to improve waiting times. (Page 7)

2

In order to increase CI Rates, Endoscopists should endeavour to keep their number of procedures high in order to maintain their skills at proficient levels. (Page 13)

3

The EQI Programme recommends that Endoscopy Units standardise recording practices using the Gloucester Scale shown on the previous page. It is also recommended that the practice of deciding a comfort score should be assessed by a third party, usually an endoscopy nurse, and agreed with the Endoscopist before recording. (Page 16)

4

It is the EQI Programme's recommendation that units adhere to the definitions of bowel preparation as set out here. The main differentiating factor between Excellent/Adequate and the others should be whether the bowel preparation was satisfactory for the intended colonoscopic assessment or not. (Page 19)

5

In order to address the high sedation usage in the over 70s patient population, it is the opinion of the EQI Programme that lower midazolam concentration options, such as 1mg/ml, should be procured by units in order to facilitate the administration of lower dosages when desired. (Page 28)

