



ANZGOSA

Australia & New Zealand  
Gastric & Oesophageal  
Surgery Association

# ANZGOSA AUDIT FINAL REPORT 2010-2017

ROYAL AUSTRALASIAN  
COLLEGE OF SURGEONS



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## ANZGOSA Audit Final Report

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## 1. EXECUTIVE SUMMARY

The ANZGOSA Audit was a quality assurance activity of the Australian and New Zealand Gastric and Oesophageal Surgical Association (ANZGOSA), running for seven years, from 2010 to 2017.

Data has been submitted consistently over this time, either directly through the ANZGOSA Audit website or sent from institutions for mapping and uploading into the audit. Over the course of the audit, a total of 2865 cases were recorded, from 74 surgeons, at 67 hospitals across three countries (Australia, New Zealand, and India).

Although the dataset will still be available for interrogation, collection of data has now officially ceased.

ANZGOSA quality assurance is intended to evolve into a safety and quality registry with a tighter quality improvement focus. ANZGOSA Audit data is expected to be incorporated into the registry.

## 2. INTRODUCTION

The ANZGOSA Audit was a quality assurance tool for members of the Australian and New Zealand Gastric and Oesophageal Surgical Association (ANZGOSA). The aim of the audit was to evaluate, improve and maintain the quality of care provided by ANZGOSA members.

Data was collected on patients undergoing surgery for oesophago-gastric cancer or gastrointestinal stromal tumour (GIST). Data collection commenced on 31 August 2010 and concluded on 30 November 2017.

The dataset is securely stored on a College server and will remain available for research.

This report gives a history of the audit and its achievements, and provides a brief outline of the next steps for ANZGOSA in the area of quality assurance.

## 3. BACKGROUND

The inspiration for the audit was the Sydney Upper Gastrointestinal Surgical Society (SUGSS) Database. Success in collecting and analysing data at the state level raised the question of whether a national or bi-national data collection exercise could be achieved.

The Royal Australasian College of Surgeons (RACS) was contracted in 2009 to set up and manage the audit for ANZGOSA. A database and online portal for data collection was developed and data collection officially went live on 31 August 2010.

Improvements and amendments were added to the portal over the years, notably a reporting suite in 2012, a data upload program in 2013 and an export data function in 2014. The audit was also approved as meeting RACS CPD requirements in 2012.

The audit was run under Ethics Approval from the Royal Australasian College of Surgeons Ethics Committee for audit activities and as a protected quality assurance activity under both Australian (for data collected from 28 May 2011 to 15 May 2016 and 13 July 2016 to audit end) and New Zealand law (for data collected from 14 April 2011 until 13 April 2016). This protection means that the audit cannot release identified data without consent from the surgeon concerned, even by subpoena.

### 3.1. Governance

The ANZGOSA Audit was directed by a Committee of ANZGOSA members.

Chairs:

- Mr Gareth Smith (2010–2011)
- Prof. Mark Smithers (2011–2012)
- Assoc. Prof. Sarah Thompson (2012–2015)

- Prof. Wendy Brown (2015–2016)
- Mr Andrew MacCormick (2016–2017)

Committee membership changed over time but included:

- Mr Ahmad Aly
- Mr Stephen Archer
- Prof. Andrew Barbour
- Prof. Peter Cosman
- Mr Krishna Epari
- Assoc. Prof. George Kiroff
- Mr Ross Roberts
- Mr Michael Rodgers
- Dr Iain Thomson

Day-to-day operation of the audit was contracted to the Royal Australasian College of Surgeons, including data management and hosting, maintenance of the web application, user support, data extraction, reporting and maintaining user support and public information about the audit through [www.surgeons.org/anzgosa](http://www.surgeons.org/anzgosa).

### 3.2. Audit staff

The audit was managed by the Morbidity Audits Department of the College, part of the Research, Audit and Academic Surgery Division located in Adelaide, South Australia. The following staff worked on the audit during its seven year history:

- Director, Research, Audit & Academic Surgery Division: Assoc. Prof. Wendy Babidge\*
- Manager, Morbidity Audits: Katherine Economides\*
- Manager, Morbidity Audits: Catherine Yap
- Manager, Morbidity Audits: Claire Marsh
- Team Leader, Morbidity Audits: Michelle Ogilvy\*
- Senior Research Officer: Primali de Silva
- Database Support Officer: Louise Kennedy
- Database Support Officer: Sze Yee Phuah
- Project Officer: Robyn McGeachie\*
- Developer: Craig Farren
- Developer: Rujul Trivedi\*
- Platform Solutions Consultant: Darren Cocco

*\* an asterisk indicates staff working on the audit at its closure in December 2017.*

The initial build for the audit system was developed by external vendors; Paul Hedger and David Williams at ServIT.

## 4. METHODOLOGY

The audit was a resource for Full Members of ANZGOSA. Participation was voluntary, and accounts could be created on request from a member.

Data was submitted either online through the web application (<https://db.anzgosa.org>) or through the institutional upload program. The upload program allowed surgeons entering similar data into an existing database, such as a hospital database, register or local audit, to have data sent via their data manager and have audit staff map, transform and upload into the audit system on their behalf. This alleviated the burden of double data entry for those surgeons.

Cases could be submitted identified (patient full name and address included) or de-identified (patient is given a code, no name or address required). In either case, access by College staff shows identifying fields as encrypted (surname, first name and street address).

Data output from the audit included:

- Online reports available to users comparing their patient outcomes to an audit aggregate
- Personal data export to allow for further analysis in Excel
- Data Request process allowed users to request further analysis by Audit staff
- Annual data reports on aggregated data were distributed at the ANZGOSA conference each year.

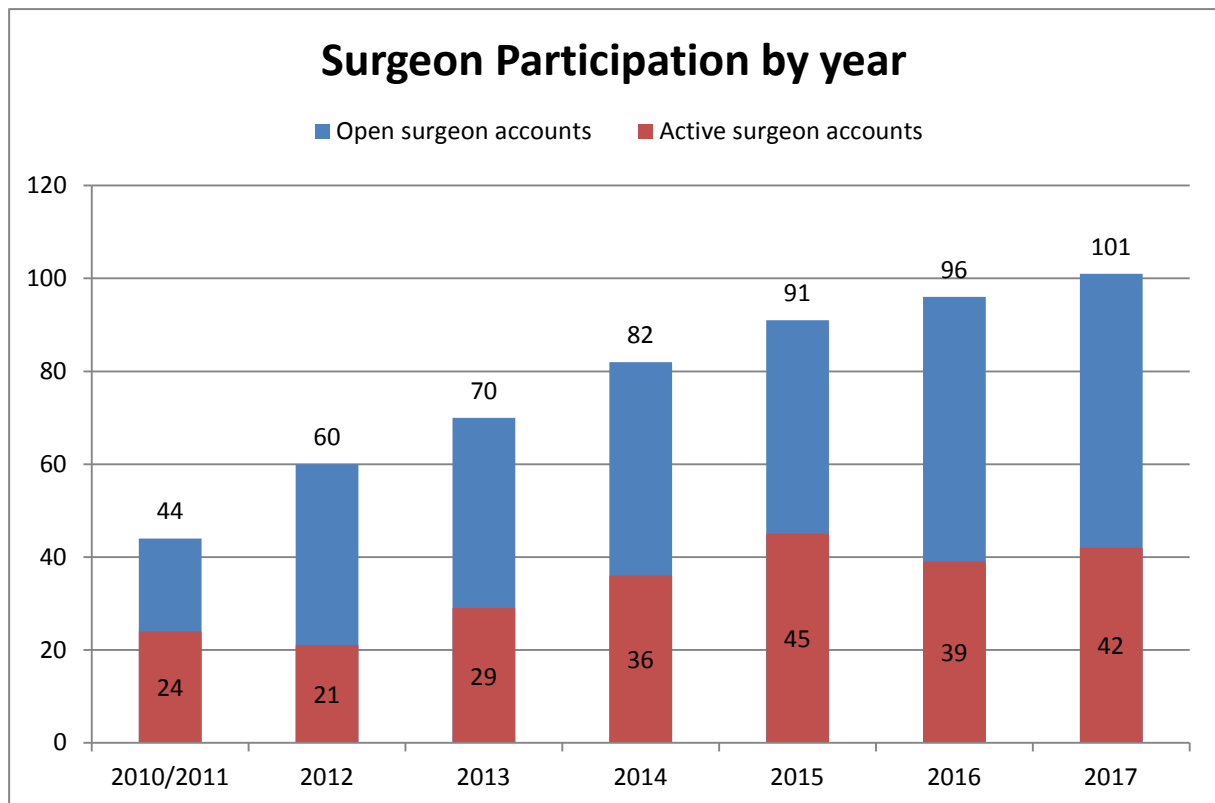
A Helpdesk was provided to users via email and phone. Additional user supports were provided on a webpage [www.surgeons.org/anzgosa](http://www.surgeons.org/anzgosa) . A total of 243 contacts from users were recorded by the Helpdesk over the life of the project.

**5. PROJECT OUTCOMES**

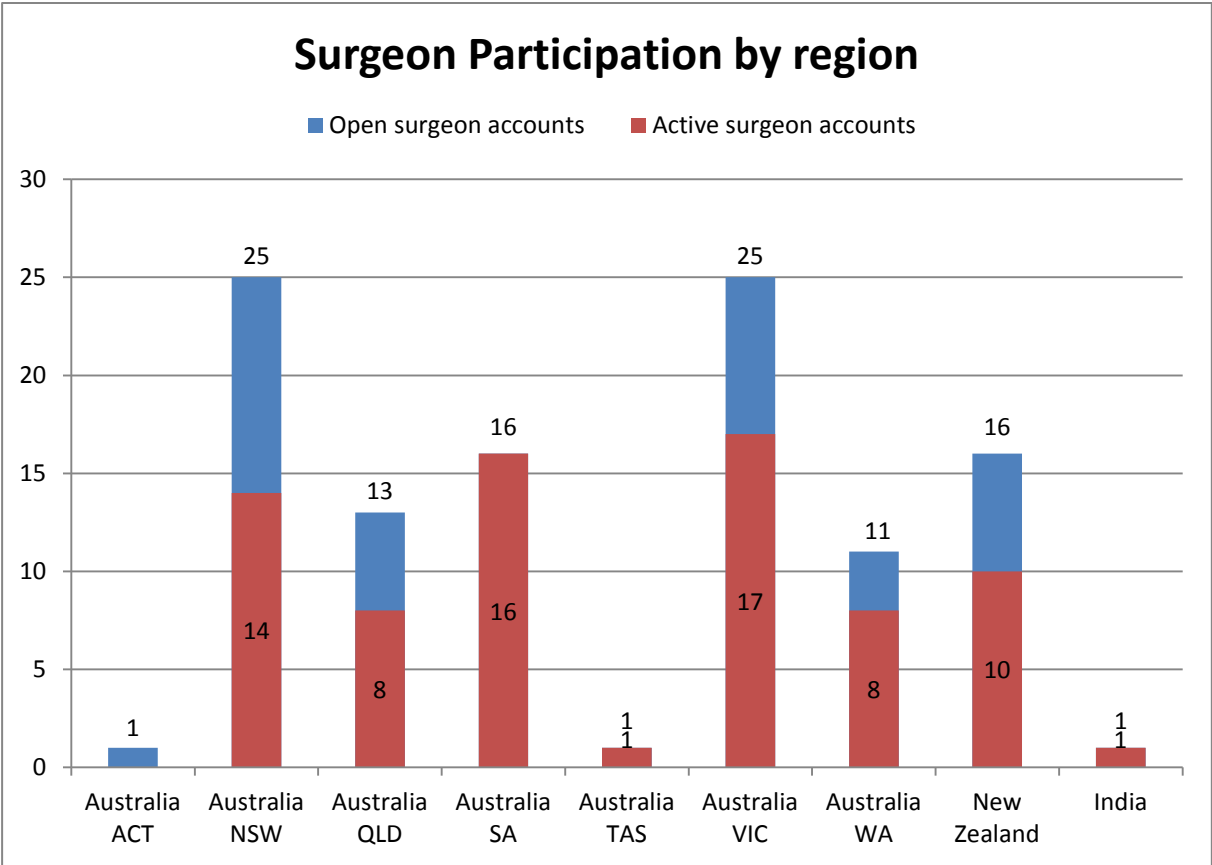
**5.1. Participation**

At the close of the audit, there were over one hundred ANZGOSA Audit members with access to the audit system. A total of 74 surgeons submitted at least one case to the audit since it opened for data collection in August 2010.

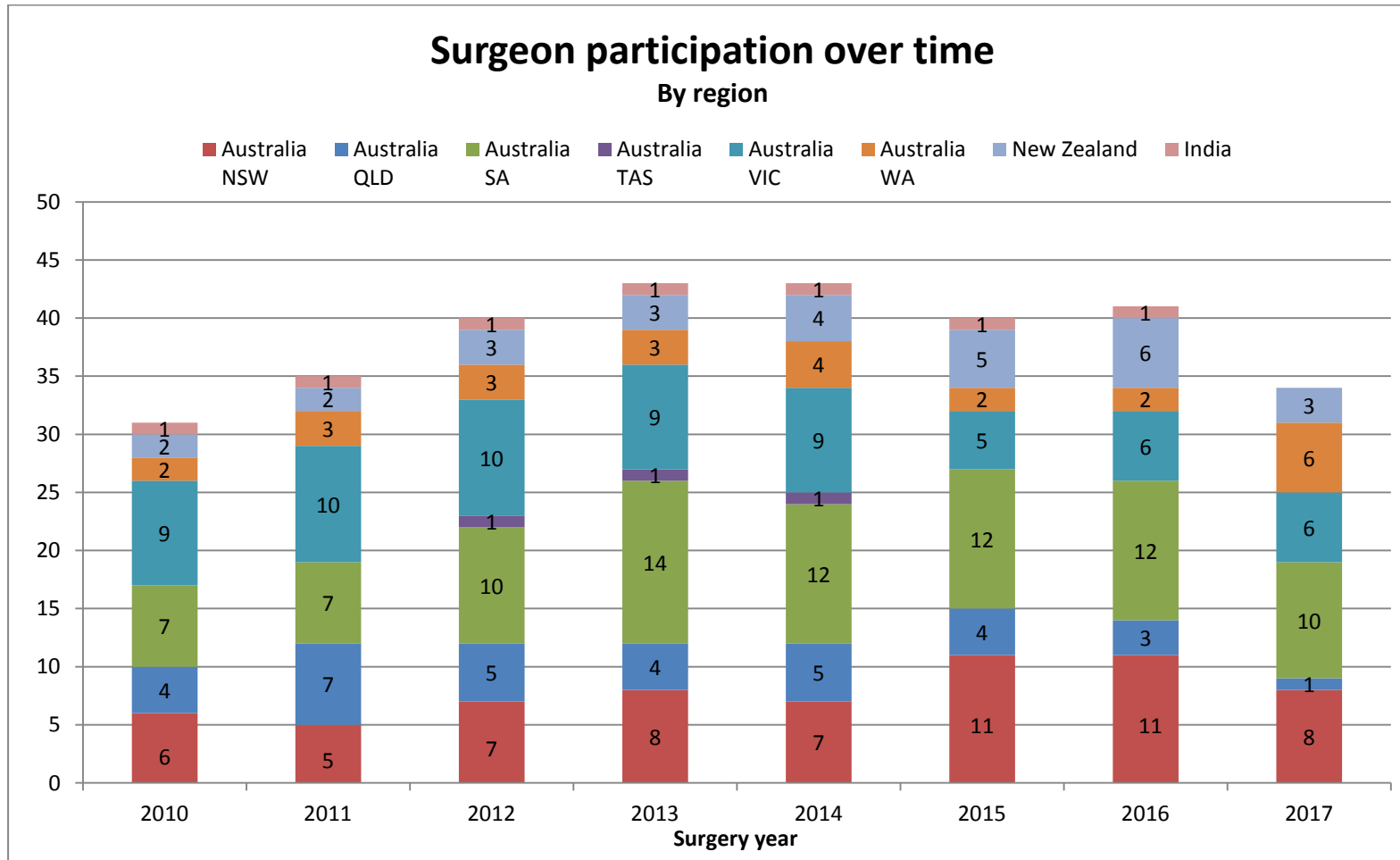
The chart below shows the number of these surgeons who were submitting cases each year, in comparison to the number of surgeons with open accounts (i.e. who *could* submit cases).



Note: Data entry did not commence until August 2010. Data entry for 2010 and 2011 have been combined in the chart above.



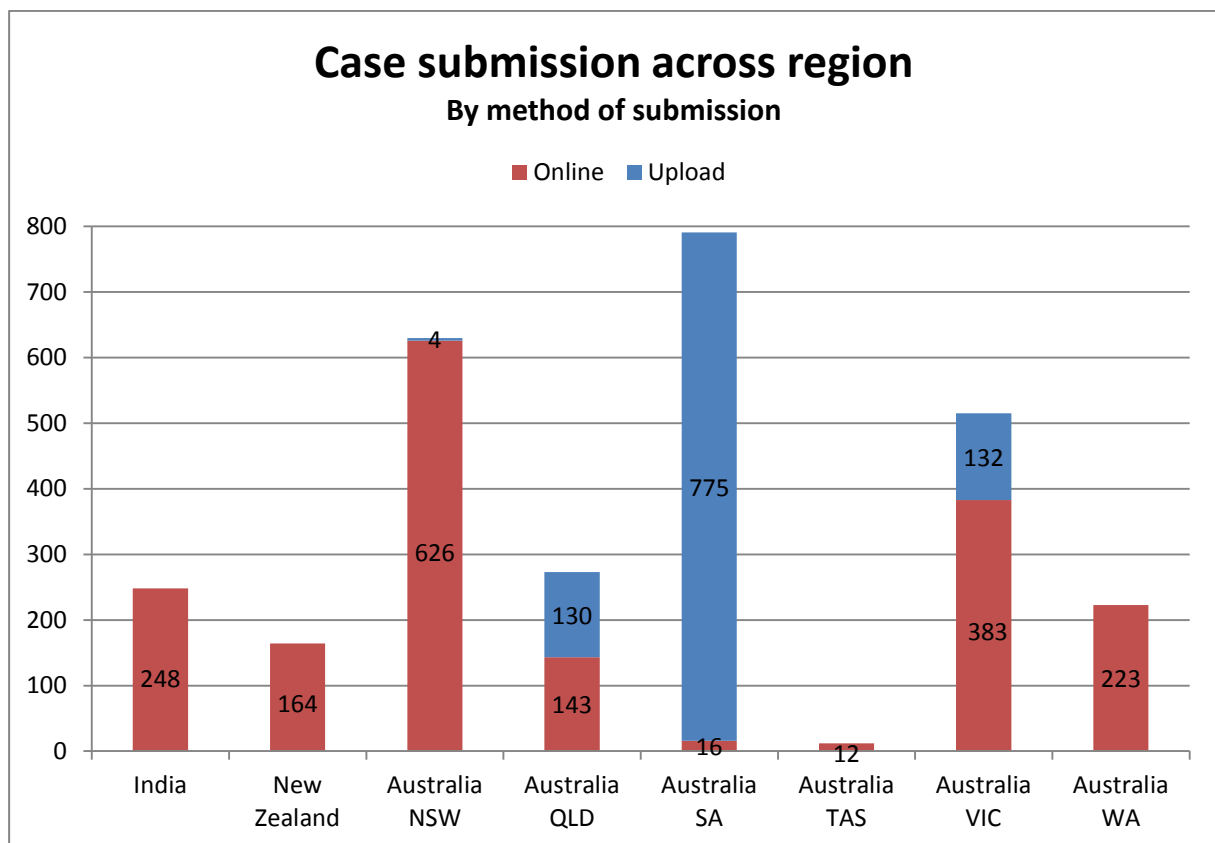
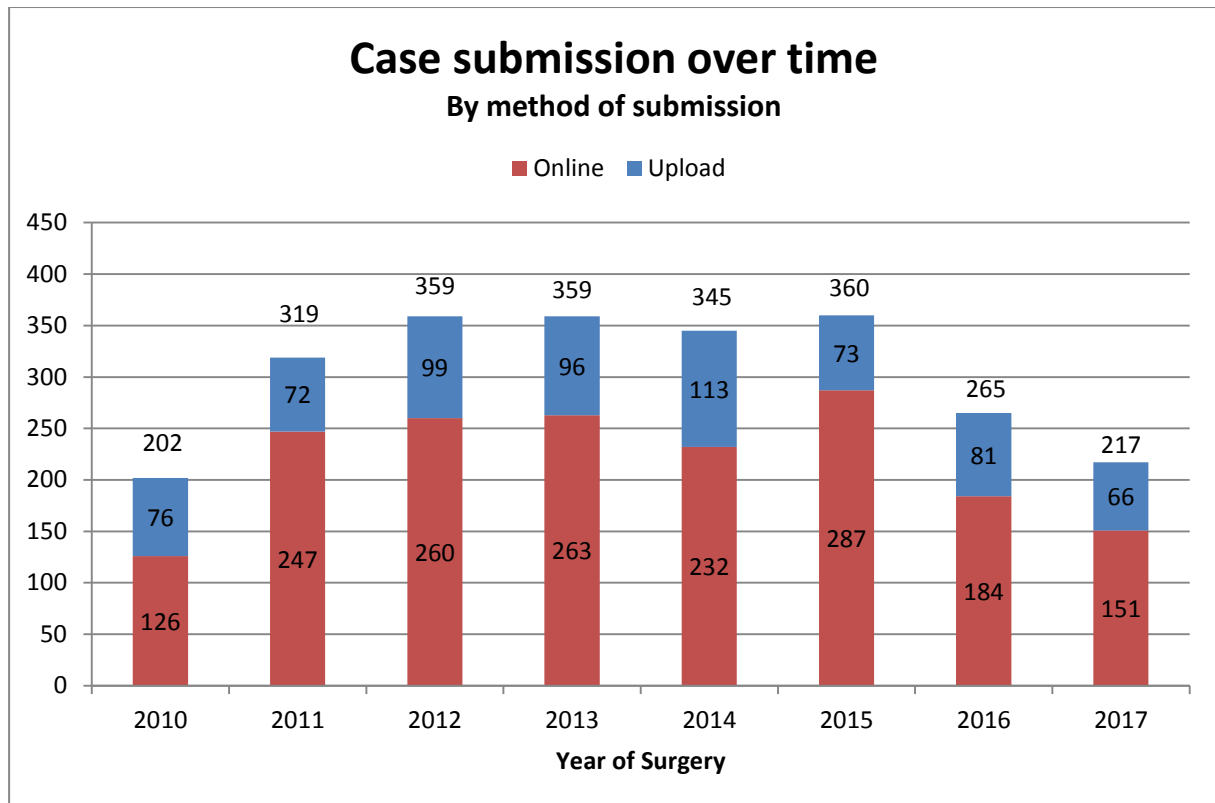
The chart below shows the pattern of participation from surgeons in each region over each year of the audit. Note that the chart compares year of surgery rather than year of data submission.



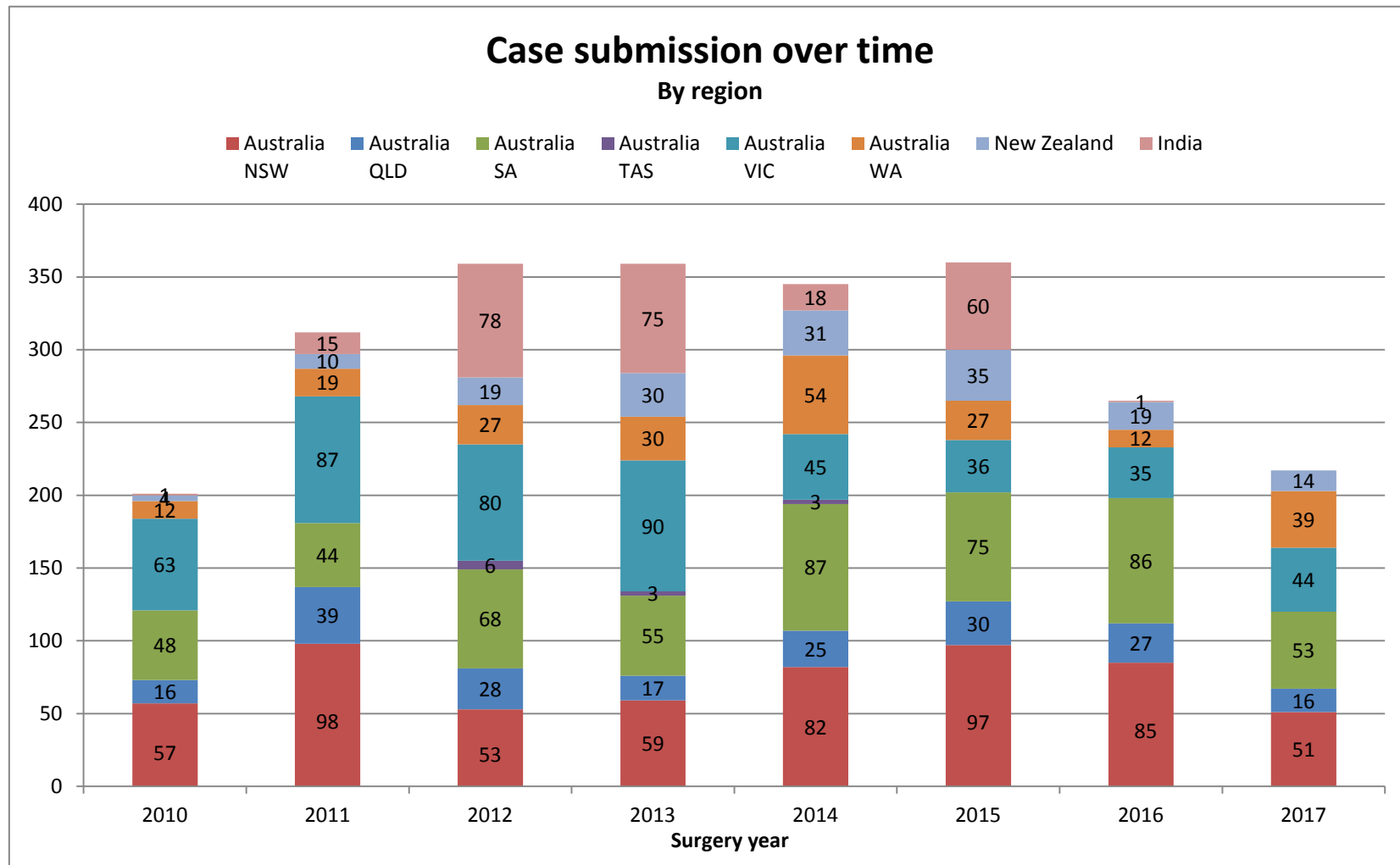


Case submission remained stable across the middle years of data collection, with a drop in the final two years. The upload program remained a significant source of data.

Uploads were completed with data from South Australia, Queensland and Victoria.



The chart below shows the submissions from each region over time. No discernible pattern emerged, with the regions submitting the largest amounts of data differing in each year.



## 5.2. Data submitted

Investigation of the data shows a large amount of missing information, particularly in outcome measures such as 30-day mortality or readmission.

Table 1 Histological diagnosis (total)

Histological diagnosis	TOTAL
Adenocarcinoma	1985
Squamous Cell Carcinoma	212
Barrett's with HGD Dysplasia	26
Neuroendocrine	20
Adeno Squamous Carcinoma	5
Lymphoma	3
Undifferentiated	4
GIST	452
Other	63
No preoperative histological diagnosis	25
Unknown	70
<b>TOTAL</b>	<b>2865</b>

Table 2: Histological diagnosis (by year)

Histological diagnosis	1999–2009	2010	2011	2012	2013	2014	2015	2016	2017
Adenocarcinoma	259	137	218	256	257	237	265	198	145
Squamous Cell Carcinoma	49	16	30	28	28	16	23	9	13
Barrett's with HGD Dysplasia	1	1	5	4	2	5	2	3	3
Neuroendocrine	0	1		4	5		3	6	1
Adeno Squamous Carcinoma	0		1	1	1	1	1		
Lymphoma	0	2	1						
Undifferentiated	0	2		1					1
GIST	73	31	46	44	52	68	48	33	39
Other	9	4	2	6	6	11	9	7	9
No preoperative histological diagnosis	3	1	4	2	2	2	4	5	2

Note: 41 cases were excluded due to missing surgery year information

Table 3 Tumour site (total)

Tumour site	TOTAL
Hypopharynx	2
Proximal 1/3 Oesophagus	14
Middle 1/3 Oesophagus	132
Distal 1/3 Oesophagus	721
Siewert 1	246
Siewert 2	144
Siewert 3	147
Stomach - fundus	275
Stomach - body	535
Stomach - antrum	438
Stomach - pylorus	72
Small intestine	36
Unknown	103
<b>TOTAL</b>	<b>2865</b>

Table 4: Tumour site (by year)

Tumour site	1999–2009	2010	2011	2012	2013	2014	2015	2016	2017
Hypopharynx	1						1		
Proximal 1/3 Oesophagus	7	1	2	1	1	1			
Middle 1/3 Oesophagus	22	13	14	13	23	15	12	6	14
Distal 1/3 Oesophagus	161	42	59	83	85	78	92	62	55
Siewert 1	83	33	39	13	14	17	16	18	12
Siewert 2	2	9	16	17	15	25	27	10	20
Siewert 3	7	16	19	20	21	17	20	15	12
Stomach - fundus	40	22	26	30	30	29	36	32	20
Stomach - body	34	21	66	81	76	90	65	61	36
Stomach - antrum	12	28	55	68	71	47	72	44	33
Stomach - pylorus	1	4	8	11	10	9	11	12	6
Small intestine	6	3	4	4	5	8	3		3
Unknown	22	10	11	18	8	9	5	5	6

Note: 41 cases were excluded due to missing surgery year information

Table 5: Procedures performed (by year)

Procedure	1999–2009	2010	2011	2012	2013	2014	2015	2016	2017
Oesophagectomy	283	108	133	135	133	138	132	93	95
Gastrectomy	42	53	134	168	162	129	176	127	80
Local excision	56	32	44	48	46	66	47	40	37
Resection abandoned	16	8	6	4	18	11	5	4	5
Unknown	1	1	2	4		1		1	
<b>TOTAL</b>	<b>398</b>	<b>202</b>	<b>319</b>	<b>359</b>	<b>359</b>	<b>345</b>	<b>360</b>	<b>265</b>	<b>217</b>

Note: 41 cases were excluded due to missing surgery year information

Table 6: Oesophagectomy approach (by year)

Approach	1999–2009	2010	2011	2012	2013	2014	2015	2016	2017
<b>Minimally invasive</b>	23 (8%)	3 (3%)	7 (5%)	9 (7%)	13 (10%)	11 (8%)	21 (16%)	5 (5%)	10 (11%)
<b>Open</b>	200 (71%)	65 (60%)	92 (69%)	82 (61%)	66 (50%)	81 (59%)	78 (59%)	57 (61%)	60 (63%)
<b>Hybrid</b>	47 (17%)	35 (32%)	31 (23%)	40 (30%)	51 (38%)	41 (30%)	33 (25%)	31 (33%)	23 (24%)
<b>Unknown</b>	13 (5%)	5 (5%)	3 (2%)	4 (3%)	3 (2%)	5 (4%)	0 (0%)	0 (0%)	2 (2%)
<b>TOTAL</b>	283	108	133	135	133	138	132	93	95

Table 7: Gastrectomy approach (by year)

Approach	1999–2009	2010	2011	2012	2013	2014	2015	2016	2017
<b>Laparoscopic</b>	5 (12%)	5 (9%)	13 (10%)	11 (7%)	17 (10%)	23 (18%)	24 (14%)	23 (18%)	31 (39%)
<b>Open</b>	28 (67%)	45 (85%)	109 (81%)	149 (89%)	143 (88%)	96 (74%)	146 (83%)	96 (76%)	48 (60%)
<b>Laparoscopic converted to open</b>	2 (5%)	0 (0%)	2 (1%)	0 (0%)	0 (0%)	6 (5%)	6 (3%)	4 (3%)	1 (1%)
<b>Unknown</b>	7 (17%)	3 (6%)	10 (7%)	8 (5%)	2 (1%)	4 (3%)	0 (0%)	4 (3%)	0 (0%)
<b>TOTAL</b>	42	53	134	168	162	129	176	127	80

Table 8: Local excision approach (by year)

Approach	1999–2009	2010	2011	2012	2013	2014	2015	2016	2017
<b>Endoscopic</b>	5 (9%)	2 (6%)	3 (7%)	6 (13%)	2 (4%)	0 (0%)	0 (0%)	2 (5%)	3 (8%)
<b>Laparoscopic</b>	41 (73%)	19 (59%)	32 (73%)	25 (52%)	28 (61%)	43 (65%)	29 (62%)	27 (68%)	24 (65%)
<b>Open</b>	0 (0%)	7 (22%)	7 (16%)	12 (25%)	9 (20%)	14 (21%)	14 (30%)	8 (20%)	9 (24%)
<b>Laparoscopic converted to open</b>	0 (0%)	2 (6%)	0 (0%)	1 (2%)	2 (4%)	4 (6%)	2 (4%)	2 (5%)	1 (3%)
<b>Unknown</b>	10 (18%)	2 (6%)	2 (5%)	4 (8%)	5 (11%)	5 (8%)	2 (4%)	1 (3%)	0 (0%)
<b>TOTAL</b>	56	32	44	48	46	66	47	40	37

Note: 1 case was excluded due to missing surgery year information

Table 9: Tumour type (total)

Tumour type	TOTAL
Oesophageal cancer	843
Oesophageal (OG) junction cancer	521
Gastric cancer	893
Gastrointestinal stromal tumour (GIST)	452
Unknown	156
<b>Total</b>	<b>2865</b>

Table 10: Tumour type (by year)

Tumour type	1999–2009	2010	2011	2012	2013	2014	2015	2016	2017
Oesophageal cancer	186	55	68	96	106	92	102	66	67
Oesophageal (OG) junction cancer	92	56	71	49	48	57	59	42	43
Gastric cancer	26	45	111	145	138	116	138	112	58
Gastrointestinal stromal tumour (GIST)	73	31	46	44	52	68	48	33	39
Unknown	21	15	23	25	15	12	13	12	10
<b>TOTAL</b>	<b>398</b>	<b>202</b>	<b>319</b>	<b>359</b>	<b>359</b>	<b>345</b>	<b>360</b>	<b>265</b>	<b>217</b>

Note: 41 cases were excluded due to missing surgery year information

Table 11: Procedures performed (by tumour type)

Procedure	TOTAL	Oesophageal	OG Junction	Gastric	GIST
Oesophagectomy	1190 (44%)	810 (96%)	369 (71%)	2 (0%)	9 (2%)
Gastrectomy	1018 (38%)	3 (0%)	133 (26%)	827 (93%)	55 (12%)
Local excision	402 (15%)	5 (1%)	0 (0%)	27 (3%)	370 (82%)
Resection abandoned	66 (2%)	20 (2%)	14 (3%)	32 (4%)	0 (0%)
Unknown	33 (1%)	5 (1%)	5 (1%)	5 (1%)	18 (4%)
<b>TOTAL</b>	<b>2709</b>	<b>843</b>	<b>521</b>	<b>893</b>	<b>452</b>

Note: 156 cases were excluded due to missing tumour type information

Table 12: Oesophagectomy approach (by tumour type)

Approach	TOTAL	Oesophageal	OG Junction	Gastric	GIST
Minimally invasive	97 (8%)	80 (10%)	17 (5%)	0 (0%)	0 (0%)
Open	721 (63%)	490 (60%)	258 (70%)	1 (50%)	2 (22%)
Hybrid	309 (26%)	226 (28%)	82 (22%)	0 (0%)	1 (11%)
Unknown	33 (3%)	14 (2%)	12 (3%)	1 (50%)	6 (67%)
<b>TOTAL</b>	<b>1190</b>	<b>810</b>	<b>369</b>	<b>2</b>	<b>9</b>

Note: 60 cases were excluded due to missing tumour type information

Table 13: Gastrectomy approach (by tumour type)

Approach	TOTAL	Oesophageal	OG Junction	Gastric	GIST
Laparoscopic	133 (13%)	1 (33%)	11 (8%)	107 (13%)	14 (25%)
Open	833 (82%)	2 (67%)	112 (84%)	688 (83%)	31 (56%)
Laparoscopic converted to open	20 (2%)	0 (0%)	2 (2%)	11 (1%)	7 (13%)
Unknown	32 (3%)	0 (0%)	8 (6%)	21 (3%)	3 (5%)
<b>TOTAL</b>	<b>1018</b>	<b>3</b>	<b>133</b>	<b>827</b>	<b>55</b>

Note: 53 cases were excluded due to missing tumour type information

Table 14: Local excision approach (by tumour type)

Approach	TOTAL	Oesophageal	OG Junction	Gastric	GIST
Endoscopic	23 (6%)	5 (100%)	0 (0%)	2 (7%)	16 (4%)
Laparoscopic	258 (64%)	0 (0%)	0 (0%)	14 (52%)	244 (66%)
Open	77 (19%)	0 (0%)	0 (0%)	10 (37%)	67 (18%)
Laparoscopic converted to open	14 (3%)	0 (0%)	0 (0%)	0 (0%)	14 (4%)
Unknown	30 (7%)	0 (0%)	0 (0%)	1 (4%)	29 (8%)
<b>TOTAL</b>	<b>402</b>	<b>5</b>	<b>0</b>	<b>27</b>	<b>370</b>

Note: 28 cases were excluded due to missing tumour type information



Table 15: Complications (by procedure)

Post-operative Complication	TOTAL	Oesophagectomy	Gastrectomy	Local excision	Resection abandoned
<b>Yes</b>	<b>931 (33%)</b>	<b>543 (43%)</b>	<b>334 (31%)</b>	<b>45 (11%)</b>	<b>9 (12%)</b>
Anastomotic leak (Clinical)	133 (5%)	91 (7%)	40 (4%)	2 (0%)	0 (0%)
Anastomotic leak (Radiological)	56 (2%)	35 (3%)	20 (2%)	1 (0%)	0 (0%)
Wound infection	78 (3%)	37 (3%)	36 (3%)	4 (1%)	1 (1%)
Peritonitis	4 (0%)	2 (0%)	2 (0%)	0 (0%)	0 (0%)
Chylothorax	48 (2%)	45 (4%)	3 (0%)	0 (0%)	0 (0%)
Pancreatic fistula	7 (0%)	0 (0%)	7 (1%)	0 (0%)	0 (0%)
Pleural effusion requiring drainage	86 (3%)	64 (5%)	21 (2%)	1 (0%)	0 (0%)
Abscess	20 (1%)	5 (0%)	13 (1%)	2 (0%)	0 (0%)
Bleeding	43 (2%)	11 (1%)	27 (3%)	4 (1%)	1 (1%)
Jejunal tube complication	33 (1%)	19 (2%)	13 (1%)	0 (0%)	1 (1%)
Other surgical complication	172 (6%)	84 (7%)	75 (7%)	11 (3%)	2 (3%)
Cardiac ischaemic event	32 (1%)	22 (2%)	10 (1%)	0 (0%)	0 (0%)
Cardiac arrhythmia	164 (6%)	122 (10%)	35 (3%)	4 (1%)	3 (4%)
Other CVS	28 (1%)	10 (1%)	15 (1%)	3 (1%)	0 (0%)
LRTI req antibiotics	189 (7%)	135 (11%)	52 (5%)	2 (0%)	0 (0%)
DVT/PE	35 (1%)	21 (2%)	14 (1%)	0 (0%)	0 (0%)
Other pulmonary	130 (5%)	87 (7%)	35 (3%)	7 (2%)	1 (1%)
Hepatic	3 (0%)	2 (0%)	1 (0%)	0 (0%)	0 (0%)
Renal	60 (2%)	30 (2%)	24 (2%)	4 (1%)	2 (3%)
CNS	30 (1%)	21 (2%)	8 (1%)	1 (0%)	0 (0%)
Other non-surgical	262 (9%)	138 (11%)	112 (10%)	10 (2%)	2 (3%)
<b>No</b>	<b>1386 (49%)</b>	<b>380 (30%)</b>	<b>628 (59%)</b>	<b>339 (81%)</b>	<b>39 (51%)</b>
<b>Unknown</b>	<b>498 (18%)</b>	<b>327 (26%)</b>	<b>109 (10%)</b>	<b>33 (8%)</b>	<b>29 (38%)</b>
<b>TOTAL</b>	<b>2815</b>	<b>1250</b>	<b>1071</b>	<b>417</b>	<b>77</b>

Note: 50 cases were excluded due to missing procedure information.

Table 16: Post-operative complication (by year and procedure)

		TOTAL	1999–2009	2010	2011	2012	2013	2014	2015	2016	2017
<b>TOTAL</b>	Yes	931 (33%)	92 (23%)	79 (39%)	104 (33%)	104 (29%)	143 (40%)	119 (35%)	131 (36%)	95 (36%)	64 (29%)
	No	1385 (49%)	83 (21%)	78 (39%)	167 (53%)	191 (54%)	169 (47%)	194 (56%)	215 (60%)	160 (61%)	128 (59%)
	Unknown	498 (18%)	222 (56%)	44 (22%)	46 (15%)	60 (17%)	47 (13%)	31 (9%)	14 (4%)	9 (3%)	25 (12%)
	TOTAL	2814	397	201	317	355	359	344	360	264	217
<b>Oesophagectomy</b>	Yes	543 (43%)	77 (27%)	44 (41%)	62 (47%)	51 (38%)	74 (56%)	69 (50%)	75 (57%)	46 (49%)	45 (47%)
	No	380 (30%)	14 (5%)	27 (25%)	43 (32%)	58 (43%)	45 (34%)	57 (41%)	53 (40%)	45 (48%)	38 (40%)
	Unknown	327 (26%)	192 (68%)	37 (34%)	28 (21%)	26 (19%)	14 (11%)	12 (9%)	4 (3%)	2 (2%)	12 (13%)
	TOTAL	1250	283	108	133	135	133	138	132	93	95
<b>Gastrectomy</b>	Yes	334 (31%)	10 (24%)	27 (51%)	36 (27%)	43 (26%)	65 (40%)	43 (33%)	50 (28%)	45 (35%)	15 (19%)
	No	628 (59%)	22 (52%)	22 (42%)	85 (63%)	100 (60%)	74 (46%)	74 (57%)	119 (68%)	76 (60%)	56 (70%)
	Unknown	109 (10%)	10 (24%)	4 (8%)	13 (10%)	25 (15%)	23 (14%)	12 (9%)	7 (4%)	6 (5%)	9 (11%)
	TOTAL	1071	42	53	134	168	162	129	176	127	80
<b>Local Excision</b>	Yes	45 (11%)	4 (7%)	6 (19%)	5 (11%)	10 (21%)	3 (7%)	5 (8%)	6 (13%)	3 (8%)	3 (8%)
	No	338 (81%)	47 (84%)	25 (78%)	36 (82%)	31 (65%)	38 (83%)	54 (82%)	39 (83%)	37 (93%)	31 (84%)
	Unknown	33 (8%)	5 (9%)	1 (3%)	3 (7%)	7 (15%)	5 (11%)	7 (11%)	2 (4%)	0 (0%)	3 (9%)
	TOTAL	416	56	32	44	48	46	66	47	40	37
<b>Resection abandoned</b>	Yes	9 (12%)	1 (6%)	2 (25%)	1 (17%)	0 (0%)	1 (6%)	2 (18%)	0 (0%)	1 (25%)	1 (20%)
	No	39 (51%)	0 (0%)	4 (50%)	3 (50%)	2 (50%)	12 (67%)	9 (82%)	4 (80%)	2 (50%)	3 (60%)
	Unknown	29 (38%)	15 (94%)	2 (25%)	2 (33%)	2 (50%)	5 (28%)	0 (0%)	1 (20%)	1 (25%)	1 (20%)
	TOTAL	77	16	8	6	4	18	11	5	4	5

Note: 41 cases were excluded due to missing surgery year information. A further 10 were excluded for missing procedure information.

Table 17: Unplanned return to theatre (by year and procedure)

		TOTAL	1999–2009	2010	2011	2012	2013	2014	2015	2016	2017
<b>TOTAL</b>	Yes	246 (9%)	40 (10%)	23 (11%)	33 (10%)	28 (8%)	26 (7%)	24 (7%)	36 (10%)	18 (7%)	18 (8%)
	No	2174 (77%)	240 (60%)	154 (77%)	234 (74%)	282 (79%)	297 (83%)	255 (74%)	306 (85%)	230 (87%)	176 (81%)
	Unknown	394 (14%)	117 (29%)	24 (12%)	50 (16%)	45 (13%)	36 (10%)	65 (19%)	18 (5%)	16 (6%)	23 (11%)
	TOTAL	2814	397	201	317	355	359	344	360	264	217
<b>Oesophagectomy</b>	Yes	153 (12%)	37 (13%)	14 (13%)	19 (14%)	20 (15%)	12 (9%)	15 (11%)	16 (12%)	11 (12%)	9 (9%)
	No	967 (77%)	206 (73%)	87 (81%)	100 (75%)	102 (76%)	109 (82%)	102 (74%)	106 (80%)	79 (85%)	76 (80%)
	Unknown	130 (10%)	40 (14%)	7 (6%)	14 (11%)	13 (10%)	12 (9%)	21 (15%)	10 (8%)	3 (3%)	10 (11%)
	TOTAL	1250	283	108	133	135	133	138	132	93	95
<b>Gastrectomy</b>	Yes	82 (8%)	2 (5%)	8 (15%)	12 (9%)	8 (5%)	12 (7%)	8 (6%)	18 (10%)	7 (6%)	7 (9%)
	No	872 (81%)	21 (50%)	40 (75%)	101 (75%)	141 (84%)	140 (86%)	100 (78%)	154 (88%)	111 (87%)	64 (80%)
	Unknown	117 (11%)	19 (45%)	5 (9%)	21 (16%)	19 (11%)	10 (6%)	21 (16%)	4 (2%)	9 (7%)	9 (11%)
	TOTAL	1071	42	53	134	168	162	129	176	127	80
<b>Local Excision</b>	Yes	10 (2%)	1 (2%)	1 (3%)	2 (5%)	0 (0%)	1 (2%)	1 (2%)	2 (4%)	0 (0%)	2 (5%)
	No	283 (68%)	7 (13%)	20 (63%)	30 (68%)	37 (77%)	36 (78%)	43 (65%)	41 (87%)	37 (93%)	32 (86%)
	Unknown	123 (30%)	48 (86%)	11 (34%)	12 (27%)	11 (23%)	9 (20%)	22 (33%)	4 (9%)	3 (8%)	3 (8%)
	TOTAL	416	56	32	44	48	46	66	47	40	37
<b>Resection abandoned</b>	Yes	1 (1%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (6%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
	No	52 (68%)	6 (38%)	7 (88%)	3 (50%)	2 (50%)	12 (67%)	10 (91%)	5 (100%)	3 (75%)	4 (80%)
	Unknown	24 (31%)	10 (63%)	1 (13%)	3 (50%)	2 (50%)	5 (28%)	1 (9%)	0 (0%)	1 (25%)	1 (20%)
	TOTAL	77	16	8	6	4	18	11	5	4	5

Note: 41 cases were excluded due to missing surgery year information. A further 10 were excluded for missing procedure information.

Table 18: Readmission within 30 days (by year and procedure)

		TOTAL	1999–2009	2010	2011	2012	2013	2014	2015	2016	2017
<b>TOTAL</b>	Yes	113 (4%)	6 (2%)	11 (5%)	14 (4%)	17 (5%)	24 (7%)	10 (3%)	10 (3%)	13 (5%)	8 (4%)
	No	1360 (48%)	115 (29%)	126 (63%)	189 (60%)	234 (66%)	229 (64%)	164 (48%)	157 (44%)	73 (28%)	73 (34%)
	Unknown	1341 (48%)	276 (70%)	64 (32%)	114 (36%)	104 (29%)	106 (30%)	170 (49%)	193 (54%)	178 (67%)	136 (63%)
	TOTAL	2814	397	201	317	355	359	344	360	264	217
<b>Oesophagectomy</b>	Yes	51 (4%)	5 (2%)	3 (3%)	6 (5%)	7 (5%)	12 (9%)	4 (3%)	5 (4%)	6 (6%)	3 (3%)
	No	477 (38%)	36 (13%)	54 (50%)	65 (49%)	79 (59%)	78 (59%)	57 (41%)	53 (40%)	27 (29%)	28 (29%)
	Unknown	722 (58%)	242 (86%)	51 (47%)	62 (47%)	49 (36%)	43 (32%)	77 (56%)	74 (56%)	60 (65%)	64 (67%)
	TOTAL	1250	283	108	133	135	133	138	132	93	95
<b>Gastrectomy</b>	Yes	54 (5%)	1 (2%)	6 (11%)	7 (5%)	9 (5%)	11 (7%)	5 (4%)	5 (3%)	7 (6%)	3 (4%)
	No	578 (54%)	30 (71%)	38 (72%)	86 (64%)	120 (71%)	106 (65%)	62 (48%)	81 (46%)	30 (24%)	25 (31%)
	Unknown	439 (41%)	11 (26%)	9 (17%)	41 (31%)	39 (23%)	45 (28%)	62 (48%)	90 (51%)	90 (71%)	52 (65%)
	TOTAL	1071	42	53	134	168	162	129	176	127	80
<b>Local Excision</b>	Yes	6 (1%)	0 (0%)	1 (3%)	1 (2%)	1 (2%)	1 (2%)	1 (2%)	0 (0%)	0 (0%)	1 (3%)
	No	272 (65%)	49 (88%)	28 (88%)	35 (80%)	33 (69%)	34 (74%)	38 (58%)	22 (47%)	14 (35%)	19 (51%)
	Unknown	138 (33%)	7 (13%)	3 (9%)	8 (18%)	14 (29%)	11 (24%)	27 (41%)	25 (53%)	26 (65%)	17 (46%)
	TOTAL	416	56	32	44	48	46	66	47	40	37
<b>Resection abandoned</b>	Yes	2 (3%)	0 (0%)	1 (13%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (20%)
	No	33 (43%)	0 (0%)	6 (75%)	3 (50%)	2 (50%)	11 (61%)	7 (64%)	1 (20%)	2 (50%)	1 (20%)
	Unknown	42 (55%)	16 (100%)	1 (13%)	3 (50%)	2 (50%)	7 (39%)	4 (36%)	4 (80%)	2 (50%)	3 (60%)
	TOTAL	77	16	8	6	4	18	11	5	4	5

Note: 41 cases were excluded due to missing surgery year information. A further 10 were excluded for missing procedure information.

Table 19: In-hospital death (by year and procedure)

		TOTAL	1999–2009	2010	2011	2012	2013	2014	2015	2016	2017
<b>TOTAL</b>	Yes	49 (2%)	8 (2%)	4 (2%)	8 (3%)	3 (1%)	6 (2%)	3 (1%)	11 (3%)	2 (1%)	4 (2%)
	No	1871 (66%)	123 (31%)	144 (72%)	214 (68%)	265 (75%)	277 (77%)	293 (85%)	259 (72%)	162 (61%)	134 (62%)
	Unknown	894 (32%)	266 (67%)	53 (26%)	95 (30%)	87 (25%)	76 (21%)	48 (14%)	90 (25%)	100 (38%)	79 (36%)
	TOTAL	2814	397	201	317	355	359	344	360	264	217
<b>Oesophagectomy</b>	Yes	35 (3%)	8 (3%)	4 (4%)	6 (5%)	2 (1%)	3 (2%)	2 (1%)	7 (5%)	2 (2%)	1 (1%)
	No	672 (54%)	41 (14%)	60 (56%)	73 (55%)	92 (68%)	99 (74%)	109 (79%)	84 (64%)	58 (62%)	56 (59%)
	Unknown	543 (43%)	234 (83%)	44 (41%)	54 (41%)	41 (30%)	31 (23%)	27 (20%)	41 (31%)	33 (35%)	38 (40%)
	TOTAL	1250	283	108	133	135	133	138	132	93	95
<b>Gastrectomy</b>	Yes	12 (1%)	0 (0%)	0 (0%)	2 (1%)	1 (1%)	2 (1%)	1 (1%)	4 (2%)	0 (0%)	2 (3%)
	No	804 (75%)	31 (74%)	46 (87%)	99 (74%)	131 (78%)	126 (78%)	109 (84%)	139 (79%)	74 (58%)	49 (61%)
	Unknown	255 (24%)	11 (26%)	7 (13%)	33 (25%)	36 (21%)	34 (21%)	19 (15%)	33 (19%)	53 (42%)	29 (36%)
	TOTAL	1071	42	53	134	168	162	129	176	127	80
<b>Local Excision</b>	Yes	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
	No	355 (85%)	51 (91%)	31 (97%)	39 (89%)	40 (83%)	41 (89%)	64 (97%)	33 (70%)	28 (70%)	28 (76%)
	Unknown	61 (15%)	5 (9%)	1 (3%)	5 (11%)	8 (17%)	5 (11%)	2 (3%)	14 (30%)	12 (30%)	9 (24%)
	TOTAL	416	56	32	44	48	46	66	47	40	37
<b>Resection abandoned</b>	Yes	2 (3%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (6%)	0 (0%)	0 (0%)	0 (0%)	1 (20%)
	No	40 (52%)	0 (0%)	7 (88%)	3 (50%)	2 (50%)	11 (61%)	11 (100%)	3 (60%)	2 (50%)	1 (20%)
	Unknown	35 (45%)	16 (100%)	1 (13%)	3 (50%)	2 (50%)	6 (33%)	0 (0%)	2 (40%)	2 (50%)	3 (60%)
	TOTAL	77	16	8	6	4	18	11	5	4	5

Note: 41 cases were excluded due to missing surgery year information. A further 10 were excluded for missing procedure information.

Table 20: 30-day mortality (by year and procedure)

		TOTAL	1999–2009	2010	2011	2012	2013	2014	2015	2016	2017
<b>TOTAL</b>	Yes	33 (1%)	3 (1%)	4 (2%)	5 (2%)	1 (0%)	5 (1%)	2 (1%)	8 (2%)	3 (1%)	2 (1%)
	No	2051 (73%)	277 (70%)	150 (75%)	230 (73%)	287 (81%)	301 (84%)	288 (84%)	255 (71%)	148 (56%)	115 (53%)
	Unknown	730 (26%)	117 (29%)	47 (23%)	82 (26%)	67 (19%)	53 (15%)	54 (16%)	97 (27%)	113 (43%)	100 (46%)
	TOTAL	2814	397	201	317	355	359	344	360	264	217
<b>Oesophagectomy</b>	Yes	18 (1%)	3 (1%)	4 (4%)	3 (2%)	0 (0%)	2 (2%)	1 (1%)	3 (2%)	1 (1%)	1 (1%)
	No	843 (67%)	175 (62%)	72 (67%)	83 (62%)	105 (78%)	114 (86%)	106 (77%)	84 (64%)	56 (60%)	48 (51%)
	Unknown	389 (31%)	105 (37%)	32 (30%)	47 (35%)	30 (22%)	17 (13%)	31 (22%)	45 (34%)	36 (39%)	46 (48%)
	TOTAL	1250	283	108	133	135	133	138	132	93	95
<b>Gastrectomy</b>	Yes	14 (1%)	0 (0%)	0 (0%)	2 (1%)	1 (1%)	2 (1%)	1 (1%)	5 (3%)	2 (2%)	1 (1%)
	No	807 (75%)	36 (86%)	43 (81%)	104 (78%)	139 (83%)	131 (81%)	109 (84%)	136 (77%)	67 (53%)	42 (53%)
	Unknown	250 (23%)	6 (14%)	10 (19%)	28 (21%)	28 (17%)	29 (18%)	19 (15%)	35 (20%)	58 (46%)	37 (46%)
	TOTAL	1071	42	53	134	168	162	129	176	127	80
<b>Local Excision</b>	Yes	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
	No	341 (82%)	51 (91%)	27 (84%)	40 (91%)	41 (85%)	41 (89%)	62 (94%)	32 (68%)	23 (58%)	24 (65%)
	Unknown	75 (18%)	5 (9%)	5 (16%)	4 (9%)	7 (15%)	5 (11%)	4 (6%)	15 (32%)	17 (43%)	13 (35%)
	TOTAL	416	56	32	44	48	46	66	47	40	37
<b>Resection abandoned</b>	Yes	1 (1%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (6%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
	No	60 (78%)	15 (94%)	8 (100%)	3 (50%)	2 (50%)	15 (83%)	11 (100%)	3 (60%)	2 (50%)	1 (20%)
	Unknown	16 (21%)	1 (6%)	0 (0%)	3 (50%)	2 (50%)	2 (11%)	0 (0%)	2 (40%)	2 (50%)	4 (80%)
	TOTAL	77	16	8	6	4	18	11	5	4	5

Note: 41 cases were excluded due to missing surgery year information. A further 10 were excluded for missing procedure information.

Table 21: Postoperative length of stay in days (by year and procedure)

		TOTAL	1999–2009	2010	2011	2012	2013	2014	2015	2016	2017
<b>TOTAL</b>	Range	0–148	2–148	1–90	2–52	0–67	1–84	0–109	1–91	0–83	0–36
	Median	11	13	12	12	11	10	10	10	9	9
<b>Oesophagectomy</b>	Range	1–148	4–148	6–55	5–50	3–67	1–84	7–109	6–78	3–54	6–36
	Median	13	14	13	14.5	13	13	13	13	12	12
<b>Gastrectomy</b>	Range	2–105	3–35	5–90	4–52	4–59	2–74	3–105	3–91	2–83	2–28
	Median	10	12	12	11	10	10	9	9	8	8
<b>Local Excision</b>	Range	0–77	2–12	1–18	2–33	0–37	2–77	1–14	1–15	0–7	0–25
	Median	5	5	5.5	5	5	4	4	5	3	3
<b>Resection abandoned</b>	Range	0–31	7–29	1–12	19–21	5–10	2–11	0–31	5–10	0–7	4–12
	Median	7	15	9	20	7.5	5	6	7	3	5

Note: 482 cases were excluded due to missing length of stay information. One further case was excluded for missing procedure information

Table 22: Postoperative length of stay for oesophagectomy patients (by surgical approach)

	TOTAL	Minimally invasive	Hybrid	Open
<b>Range</b>	1-148 days	6-74 days	2-84 days	1-148 days
<b>Median</b>	13 days	12 days	13 days	14 days

Note: Length of stay information missing for 212 cases. These have been excluded. 28 cases where surgical approach was unknown were also excluded.

Table 23: Postoperative length of stay for gastrectomy patients (by surgical approach)

	TOTAL	Laparoscopic	Open	Laparoscopic converted to open
<b>Range</b>	2-105 days	2-83 days	3-105 days	4-51 days
<b>Median</b>	10 days	7 days	10 days	11.5 days

Note: Length of stay information missing for 134 cases. These have been excluded.

Table 24: Postoperative length of stay for local excision patients (by surgical approach)

	TOTAL	Endoscopic	Laparoscopic	Open	Laparoscopic converted to open
<b>Range</b>	0-77 days	0-33 days	1-21 days	2-45 days	3-77 days
<b>Median</b>	4 days	5 days	4 days	6 days	6 days

Note: Length of stay information missing for 42 cases. These have been excluded. 5 cases where surgical approach was unknown were also excluded.

Table 25: Planned chemotherapy (by tumour type)

Approach	TOTAL	Oesophageal	OG Junction	Gastric	GIST
<b>Pre-surgery chemotherapy</b>	814 (30%)	462 (55%)	211 (40%)	127 (14%)	14 (3%)
<b>Post-surgery chemotherapy</b>	372 (14%)	31 (4%)	46 (9%)	248 (28%)	47 (10%)
<b>Both pre- and post-surgery chemotherapy</b>	382 (14%)	113 (13%)	119 (23%)	145 (16%)	5 (1%)
<b>No chemotherapy</b>	907 (33%)	217 (26%)	131 (25%)	336 (38%)	223 (49%)
<b>Unknown</b>	234 (9%)	20 (2%)	14 (3%)	37 (4%)	163 (36%)
<b>TOTAL</b>	2709	843	521	893	452

Note: 156 cases were excluded due to missing tumour type information

Table 26: Planned radiotherapy (by tumour type)

Approach	TOTAL	Oesophageal	OG Junction	Gastric	GIST
<b>Pre-surgery radiotherapy</b>	554 (20%)	405 (48%)	129 (25%)	20 (2%)	0 (0%)
<b>Post-surgery radiotherapy</b>	69 (3%)	17 (2%)	19 (4%)	32 (4%)	1 (0%)
<b>Both pre- and post-surgery radiotherapy</b>	3 (0%)	1 (0%)	2 (0%)	0 (0%)	0 (0%)
<b>No radiotherapy</b>	1721 (64%)	373 (44%)	322 (62%)	751 (84%)	275 (61%)
<b>Unknown</b>	362 (13%)	47 (6%)	49 (9%)	90 (10%)	176 (39%)
<b>TOTAL</b>	2709	843	521	893	452

Note: 156 cases were excluded due to missing tumour type information



Table 27: Planned chemotherapy (by year and tumour type)

	Procedure	1999–2009	2010	2011	2012	2013	2014	2015	2016	2017
<b>TOTAL</b>	Pre-surgery chemotherapy	149 (40%)	59 (32%)	81 (27%)	80 (24%)	80 (23%)	102 (31%)	109 (31%)	85 (34%)	65 (31%)
	Post-surgery chemotherapy	8 (2%)	15 (8%)	29 (10%)	71 (21%)	64 (19%)	24 (7%)	63 (18%)	61 (24%)	37 (18%)
	Both pre- and post-surgery	11 (3%)	37 (20%)	47 (16%)	56 (17%)	60 (17%)	58 (17%)	43 (12%)	32 (13%)	33 (16%)
	No chemotherapy	126 (33%)	60 (32%)	114 (39%)	102 (31%)	125 (36%)	122 (37%)	120 (35%)	70 (28%)	66 (32%)
	Unknown	83 (22%)	16 (9%)	25 (8%)	25 (7%)	15 (4%)	27 (8%)	12 (3%)	5 (2%)	6 (3%)
	<b>TOTAL</b>		<b>377</b>	<b>187</b>	<b>296</b>	<b>334</b>	<b>344</b>	<b>333</b>	<b>347</b>	<b>253</b>
<b>Oesophageal</b>	Pre-surgery chemotherapy	98 (53%)	33 (60%)	34 (50%)	46 (48%)	47 (44%)	52 (57%)	66 (65%)	43 (65%)	42 (63%)
	Post-surgery chemotherapy	3 (2%)	0 (0%)	2 (3%)	2 (2%)	5 (5%)	2 (2%)	6 (6%)	4 (6%)	7 (10%)
	Both pre- and post-surgery	6 (3%)	7 (13%)	8 (12%)	20 (21%)	25 (24%)	14 (15%)	12 (12%)	11 (17%)	7 (10%)
	No chemotherapy	69 (37%)	14 (25%)	22 (32%)	27 (28%)	27 (25%)	23 (25%)	17 (17%)	7 (11%)	10 (15%)
	Unknown	10 (5%)	1 (2%)	2 (3%)	1 (1%)	2 (2%)	1 (1%)	1 (1%)	1 (2%)	1 (1%)
	<b>TOTAL</b>		<b>186</b>	<b>55</b>	<b>68</b>	<b>96</b>	<b>106</b>	<b>92</b>	<b>102</b>	<b>66</b>
<b>OG Junction</b>	Pre-surgery chemotherapy	45 (49%)	20 (36%)	29 (41%)	17 (35%)	16 (33%)	25 (44%)	19 (32%)	23 (55%)	16 (37%)
	Post-surgery chemotherapy	1 (1%)	2 (4%)	5 (7%)	8 (16%)	6 (13%)	3 (5%)	5 (8%)	9 (21%)	7 (16%)
	Both pre- and post-surgery	3 (3%)	21 (38%)	17 (24%)	17 (35%)	14 (29%)	15 (26%)	14 (24%)	5 (12%)	11 (26%)
	No chemotherapy	36 (39%)	12 (21%)	18 (25%)	6 (12%)	12 (25%)	14 (25%)	19 (32%)	5 (12%)	9 (21%)
	Unknown	7 (8%)	1 (2%)	2 (3%)	1 (2%)	0 (0%)	0 (0%)	2 (3%)	0 (0%)	0 (0%)
	<b>TOTAL</b>		<b>92</b>	<b>56</b>	<b>71</b>	<b>49</b>	<b>48</b>	<b>57</b>	<b>59</b>	<b>42</b>
<b>Gastric</b>	Pre-surgery chemotherapy	6 (23%)	5 (11%)	16 (14%)	16 (11%)	13 (9%)	23 (20%)	22 (16%)	19 (17%)	5 (9%)
	Post-surgery chemotherapy	3 (12%)	9 (20%)	20 (18%)	57 (39%)	51 (37%)	14 (12%)	44 (32%)	36 (32%)	14 (24%)
	Both pre- and post-surgery	2 (8%)	9 (20%)	21 (19%)	19 (13%)	20 (14%)	29 (25%)	16 (12%)	16 (14%)	13 (22%)
	No chemotherapy	13 (50%)	22 (49%)	47 (42%)	40 (28%)	53 (38%)	44 (38%)	54 (39%)	40 (36%)	22 (38%)
	Unknown	2 (8%)	0 (0%)	7 (6%)	13 (9%)	1 (1%)	6 (5%)	2 (1%)	1 (1%)	4 (7%)
	<b>TOTAL</b>		<b>26</b>	<b>45</b>	<b>111</b>	<b>145</b>	<b>138</b>	<b>116</b>	<b>138</b>	<b>112</b>
<b>GIST</b>	Pre-surgery chemotherapy	0 (0%)	1 (3%)	2 (4%)	1 (2%)	4 (8%)	2 (3%)	2 (4%)	0 (0%)	2 (5%)
	Post-surgery chemotherapy	1 (1%)	4 (13%)	2 (4%)	4 (9%)	2 (4%)	5 (7%)	8 (17%)	12 (36%)	9 (23%)
	Both pre- and post-surgery	0 (0%)	0 (0%)	1 (2%)	0 (0%)	1 (2%)	0 (0%)	1 (2%)	0 (0%)	2 (5%)
	No chemotherapy	8 (11%)	12 (39%)	27 (59%)	29 (66%)	33 (63%)	41 (60%)	30 (63%)	18 (55%)	25 (64%)
	Unknown	64 (88%)	14 (45%)	14 (30%)	10 (23%)	12 (23%)	20 (29%)	7 (15%)	3 (9%)	1 (3%)
	<b>TOTAL</b>		<b>73</b>	<b>31</b>	<b>46</b>	<b>44</b>	<b>52</b>	<b>68</b>	<b>48</b>	<b>33</b>

Note: 41 cases were excluded due to missing surgery year information. A further 146 were excluded due to missing tumour type information.

Table 28: Planned radiotherapy (by year and tumour type)

	Procedure	1999–2009	2010	2011	2012	2013	2014	2015	2016	2017
<b>TOTAL</b>	Pre-surgery radiotherapy	137 (36%)	46 (25%)	40 (14%)	47 (14%)	39 (11%)	58 (17%)	71 (20%)	61 (24%)	52 (25%)
	Post-surgery radiotherapy	8 (2%)	5 (3%)	7 (2%)	10 (3%)	8 (2%)	8 (2%)	9 (3%)	9 (4%)	5 (2%)
	Both pre- and post-surgery	1 (0%)	2 (1%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
	No radiotherapy	142 (38%)	107 (57%)	208 (70%)	241 (72%)	255 (74%)	223 (67%)	244 (70%)	161 (64%)	134 (65%)
	Unknown	89 (24%)	27 (14%)	41 (14%)	36 (11%)	42 (12%)	44 (13%)	23 (7%)	22 (9%)	16 (8%)
	<b>TOTAL</b>		<b>377</b>	<b>187</b>	<b>296</b>	<b>334</b>	<b>344</b>	<b>333</b>	<b>347</b>	<b>253</b>
<b>Oesophageal</b>	Pre-surgery radiotherapy	96 (52%)	27 (49%)	25 (37%)	34 (35%)	34 (32%)	42 (46%)	63 (62%)	41 (62%)	41 (61%)
	Post-surgery radiotherapy	4 (2%)	1 (2%)	2 (3%)	2 (2%)	2 (2%)	1 (1%)	3 (3%)	0 (0%)	2 (3%)
	Both pre- and post-surgery	0 (0%)	1 (2%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
	No radiotherapy	76 (41%)	24 (44%)	37 (54%)	56 (58%)	61 (58%)	42 (46%)	34 (33%)	19 (29%)	22 (33%)
	Unknown	10 (5%)	2 (4%)	4 (6%)	4 (4%)	9 (8%)	7 (8%)	2 (2%)	6 (9%)	2 (3%)
	<b>TOTAL</b>		<b>186</b>	<b>55</b>	<b>68</b>	<b>96</b>	<b>106</b>	<b>92</b>	<b>102</b>	<b>66</b>
<b>OG Junction</b>	Pre-surgery radiotherapy	37 (40%)	17 (30%)	12 (17%)	9 (18%)	3 (6%)	15 (26%)	7 (12%)	17 (40%)	11 (26%)
	Post-surgery radiotherapy	1 (1%)	1 (2%)	5 (7%)	5 (10%)	2 (4%)	2 (4%)	2 (3%)	1 (2%)	0 (0%)
	Both pre- and post-surgery	1 (1%)	1 (2%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
	No radiotherapy	42 (46%)	31 (55%)	45 (63%)	32 (65%)	38 (79%)	33 (58%)	46 (78%)	22 (52%)	32 (74%)
	Unknown	11 (12%)	6 (11%)	9 (13%)	3 (6%)	5 (10%)	7 (12%)	4 (7%)	2 (5%)	0 (0%)
	<b>TOTAL</b>		<b>92</b>	<b>56</b>	<b>71</b>	<b>49</b>	<b>48</b>	<b>57</b>	<b>59</b>	<b>42</b>
<b>Gastric</b>	Pre-surgery radiotherapy	4 (15%)	2 (4%)	3 (3%)	4 (3%)	2 (1%)	1 (1%)	1 (1%)	3 (3%)	0 (0%)
	Post-surgery radiotherapy	3 (12%)	3 (7%)	0 (0%)	3 (2%)	4 (3%)	5 (4%)	4 (3%)	7 (6%)	3 (5%)
	Both pre- and post-surgery	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
	No radiotherapy	15 (58%)	37 (82%)	94 (85%)	119 (82%)	119 (86%)	101 (87%)	126 (91%)	92 (82%)	45 (78%)
	Unknown	4 (15%)	3 (7%)	14 (13%)	19 (13%)	13 (9%)	9 (8%)	7 (5%)	10 (9%)	10 (17%)
	<b>TOTAL</b>		<b>26</b>	<b>45</b>	<b>111</b>	<b>145</b>	<b>138</b>	<b>116</b>	<b>138</b>	<b>112</b>
<b>GIST</b>	Pre-surgery radiotherapy	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
	Post-surgery radiotherapy	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (3%)	0 (0%)
	Both pre- and post-surgery	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
	No radiotherapy	9 (12%)	15 (48%)	32 (70%)	34 (77%)	37 (71%)	47 (69%)	38 (79%)	28 (85%)	35 (90%)
	Unknown	64 (88%)	16 (52%)	14 (30%)	10 (23%)	15 (29%)	21 (31%)	10 (21%)	4 (12%)	4 (10%)
	<b>TOTAL</b>		<b>73</b>	<b>31</b>	<b>46</b>	<b>44</b>	<b>52</b>	<b>68</b>	<b>48</b>	<b>33</b>

Note: 41 cases were excluded due to missing surgery year information. A further 146 were excluded due to missing tumour type information.

### 5.3. Output

A total of eight data requests were received during the operation of the audit.

**Table 29: Data releases**

Year	Requester	Reason	Data requested	Status
2012	Participant	Research	Gastrectomies being performed laparoscopically	Complete
2013	Data manager	Administrative	Cross-check own database (before export was available)	Complete
2013	University	Presentation	Gastric cancers by year, gastrectomies by type in previous year	Complete
2014	Participant	Presentation	Various information on GIST cases	Complete
2015	Participant	Research	Raw data on GIST cases	Complete
2016	Gastroenterologist	Research	Raw data on patients with early oesophageal adenocarcinoma	Denied (no Ethics approval provided)
2016	Epidemiologist	Research	link audit with NDI for survival data to benchmark	Withdrawn (funding not acquired)
2017	Participant	Presentation	Various information on oesophagectomies	Complete

The research performed resulted in one paper published in a peer-reviewed journal:

Parameswaran, R., Roberts, R. H., Brown, W. A., Aly, A., Kiroff, G., Epari, K., MacCormick, A. D., Thomson, I. G. and Thompson, S. K. (2017), Surgery for gastrointestinal stromal tumours in Australia and New Zealand: results from a bi-national audit. *ANZ Journal of Surgery*, 87: 220–221. doi:10.1111/ans.13840

Annual data reports were also produced between 2014 and 2017. Copies can be downloaded from the ANZGOSA Audit webpage at [www.surgeons.org/anzgosa](http://www.surgeons.org/anzgosa).

The webpage also has a link to download a copy of the 2014 presentation on GIST cases resulting from the data request listed above.

Participants and researchers can continue to make requests on the ANZGOSA Audit data. Access details are provided on the audit webpage [www.surgeons.org/anzgosa](http://www.surgeons.org/anzgosa).

## 6. FINANCES AND FUNDING

The audit was funded entirely by industry and ANZGOSA membership fees. Novartis provided seed funds in 2009 to get the audit up and running and Johnson and Johnson and Applied Medical have provided additional support in more recent times.

## 7. FUTURE PLANS

The ANZGOSA Audit is considered Phase 2 of quality assurance for ANZGOSA members (Phase 1 being the SUGSS database mentioned in section 3 of this report). There were issues regarding coverage and completeness, which may partly be caused by the voluntary nature of the audit, but also that the dataset was large and generalised.

ANZGOSA will take the lessons learned with the audit into planning for Phase 3, a safety and quality registry. Members are to be surveyed on what they require from the registry and outcome measures will be determined by ANZGOSA governance. Then a streamlined, fit-for-purpose dataset can be developed to address these needs.

It is anticipated that ANZGOSA Audit data will be migrated over into the registry once it is up and running. In the meantime, the dataset is stored at the College and available for research and quality assurance requests.