

**The Association of Upper Gastrointestinal
Surgeons of Great Britain and Ireland**

AUGIS

**Second
Database Report**

2004

Prepared by

Mr Richard Hardwick MD FRCS

Ms Sharon Davies

on behalf of the Association of Upper Gastrointestinal
Surgeons of Great Britain and Ireland

Robin Kinsman BSc PhD

Dendrite Clinical Systems

AUGIS Audit Report 2004

AUGIS

The Association of Upper Gastrointestinal
Surgeons of Great Britain and Ireland
gratefully acknowledge the assistance of
Dendrite Clinical Systems Ltd
for data analysis
and publishing this report.

Dendrite Clinical Systems Ltd is registered
under the Data Protection Act
Data Protection Act Register Number
Y33 54 136

This document is proprietary information that is protected by copyright. All rights reserved. No part of this document may be photocopied, stored in a retrieval system, transmitted in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without the permission of the publishers and without prior written consent from the Association of Upper Gastrointestinal Surgeons of Great Britain and Ireland %
*****.

Windows and Excel are registered trademarks of the Microsoft Corporation.

Crystal Reports is a registered trademark of Crystal Decisions.

The Patient Analysis & Tracking System is a registered trademark of Axis Clinical Software Inc.

**** 2004 Edition. A catalogue record for this book is available from the British Library. ISBN *_*****_**_*

Published by:

Dendrite Clinical Systems Ltd, 59A Bell Street, Henley-on-Thames, Oxfordshire RG9 2BA, United Kingdom

Contact details: Phone: +44 1491 411 288, Fax: +44 1491 411 377, E-mail: publishing@e-dendrite.com

Printed and Bound by CPL Associates

DENDRITE
CLINICAL SYSTEMS LTD

InterSystems
CACHE
Make Applications Faster

AUGIS Audit Report 2004

Preface

The first national AUGIS database report was produced in 2002. It consisted of data submitted from only five sources. It is gratifying that the present report is over 70 pages and includes data from over 600 operations over a 12-month period from 19 hospitals. Although we have a long way to go, this represents a great step forward. The report provides significant information, which will be of value to surgeons, patients and all those interested in cancer care provision.

The information has been compiled from either the **PATS** software from Dendrite Clinical Systems Ltd or an access file on a floppy disc. All of the data collation has been done by Sharon Davies, Data Manager at the Northern Oesophago-Gastric Cancer Unit to whom I personally, and AUGIS in general are extremely grateful.

There have been, of course, many difficulties. By no means have even a majority of surgeons performing oesophago-gastric surgery submitted their data. There have been problems with merging the data from the two sources and there has also been much missing data. Nevertheless, significant information has still been gathered and interpreted. One of the key principles inherent for the success of this audit was that submission should remain anonymous. An identifier would only be used only to ensure that the submissions by an individual unit could be tracked. It is true that in specialties such as ours, operative mortality is the best-recognised outcome measure. Indeed mortality after an oesophago-gastric surgical intervention is not uncommon. Nevertheless, the gold standards for quality of care and outcome in oesophago-gastric surgery are also measured in complication rates and in particular identifying outcomes following specific complications. This report has yielded information in this area.

The opportunity to assess the measurement of such quality is crucial for patient confidence. For clinicians there is an educational benefit from comparing not just outcome, but activity and process with their colleagues. Indeed this information will become an important component of an individual's local appraisal. The activity and outcome monitoring is essential for institutions such that outside assessment and the planning of service configuration and resource allocation can be made appropriately.

The membership of the Association of Upper Gastro-Intestinal Surgeons of Great Britain and Ireland is open to all surgeons who are performing upper gastrointestinal surgery. I strongly recommend those reading this report who are not members to join and those members who have not contributed data to do so in the future. I have no doubt that all surgeons would wish to contribute to demonstrate our commitment to transparency and quality. Unless this process is handled sensitively, appropriately and properly patients and surgeons alike will feel disillusioned. I believe that from a small beginning we have started to develop a hugely important audit programme that needs all of your support in the coming years. I am confident that this will continue to evolve under AUGIS auspices.

Finally, I wish to thank Richard Hardwick as Chairman of our Audit Committee for all his hard work, Robin Kinsman for his help analysing and presenting the data, Peter McCulloch for his help with the development of the Access file and Sharon Davies for her enormous industry in collating the data.

Prof. S Michael Griffin
President of AUGIS

Contributors

Addenbrookes Hospital, Cambridge
Bristol Royal Infirmary
Charing Cross Hospital, London
Chorley District Hospital, Lancashire
Derriford Hospital, Plymouth
Guy's & St Thomas' Hospital, London
James Cook University Hospital, Middlesbrough
Mater Hospital, Belfast
Royal Bournemouth Hospital / Poole Hospital
Royal Infirmary of Edinburgh
Royal Oldham Hospital
Royal Victoria Infirmary
South Manchester University Hospital
Southampton General Hospital
Southend General Hospital
The Royal London Hospital
University Hospital of Wales
West Hertfordshire NHS Trust
Ysbyty Gwynedd Hospital, Gwynedd

AUGIS Audit Report 2004

Table of contents

Preface	3
Contributors	4
Table of contents	5
Introduction	7
Analyses	8
Demographic and organ of origin	8
Hospitals and data reported	8
Organ of origin of cancer	9
Age at diagnosis	11
Gender	13
Process	14
Time from referral to initial visit	14
Time from referral to initial visit and organ of origin of cancer	14
Time from referral to initial visit and hospital	15
Time from initial visit to operation	16
Time from initial visit to operation and organ of origin of cancer	16
Time from initial visit to operation and hospital	17
Diagnosis and staging	18
ICD-10 classification	18
Histological diagnosis	20
Management	22
Multi-disciplinary team (MDT) meeting	22
MDT meeting and organ of origin of cancer	22
MDT meeting and hospital	23
Pre-treatment stage	25
Treatment intent	27
Treatment	28
Seen by a specialist nurse	30
Seen by a specialist nurse and organ of origin of cancer	30
Seen by a specialist nurse and hospital	31
Operation	33
ASA grade	36
ASA grade and organ of origin of cancer	36
ASA grade and age	37
Physiological POSSUM score	39
Pathology	41
Margin involvement	43
Proximal margins and organ of origin of cancer	43
Distal margins and organ of origin of cancer	44
Radial margins and organ of origin of cancer	45
Nodes	46
Nodes removed	46
Positive nodes	49
Nodes removed and positive nodes	52
Operation, margin involvement and nodes removed	53

AUGIS Audit Report 2004

Outcomes	54
Stay in critical care	54
Complications	56
Complications and organ of origin of cancer	56
Complications and hospital	58
In-hospital mortality	60
In-hospital mortality and organ of origin of cancer	60
In-hospital mortality and volume	61
In-hospital mortality and operation	64
30-day mortality	66
30-day mortality and organ of origin of cancer	66
30-day mortality and volume	67
Summary	70

Introduction

Following the first AUGIS database report in 2002, it was agreed that the Association would attempt to collect information prospectively for patients presenting to members with Oesophago-gastric cancer. The resulting database has over 500 fields, but the smaller minimum dataset has just 63. As time progressed, it became increasingly clear that collecting even this minimum dataset on all patients was going to prove impossible and The Audit & Clinical Services Committee of AUGIS decided to focus only on patients having surgery between 1st October 2002 and 30th September 2003. Members were invited to send in their data using either the **PATS** software from Dendrite or a Microsoft Access™ file kindly prepared by Peter McCulloch on floppy disc. The collation of these data was done by Sharon Davies, Data Manger at the Northern Oesophago-gastric Unit. Without her this report would not have been possible and I am extremely grateful to her.

As you would expect, there have been difficulties. Persuading Surgeons to send in data was not too difficult and I thank all of you who did so. What was more problematic was cleaning and merging the data, especially as there were some bugs in the Access discs, which many responders used to return their data. Many fields remained unfilled and, without a full time data clerk to chase up each incomplete case, it was impossible to improve the quality of the data. Robin Kinsman at Dendrite has done a splendid job analysing and presenting our data and I thank him and Peter Walton for their professional help with this report.

Having said all this, there are some interesting findings. We discover that Hospital mortality after resection of Oesophago-gastric cancer in this group is around 5% having been about 9% in the previous report. Caution is needed in interpreting this as the current report only covers 612 operations over a one-year period and the contributing Hospitals may not be representative of the total group performing this type of surgery. Also, as the numbers are relatively small and much of the data incomplete, it is impossible to do meaningful statistical analyses.

The report shows that 48% of resections were for node negative disease, there were very few *open & shut* laparotomies (only 4%) and that the number of Stage IV advanced tumours resected was only 9% for the stomach and 3% for the oesophagus. This suggests that the Surgeons are being very selective on whom they operate and detailed pre-operative staging has detected those with incurable disease so that appropriate palliation can be provided.

On the down side, we discover that nearly 20% of resections had tumour at either the proximal or distal resection margin. This is one factor that Surgeons have considerable influence over and a positive longitudinal resection margin is usually avoidable. Nodal yields were generally high but there was a large variation between Hospitals and some patients with gastric tumours did not have the necessary 15 nodes examined for TNM staging. The overall anastomotic leak rate was 12%, which is similar to the previous report and, as expected, pulmonary complications are very common. We operate on an unfit population (34% ASA grade 3&4) who are at significant risk of complications and the low mortality rates reported here are a testament to the hard work and skill of the multi-disciplinary teams who contributed to this audit.

I hope that you find this report interesting and informative.

Mr Richard H Hardwick
AUGIS Audit Committee Chair

Analyses

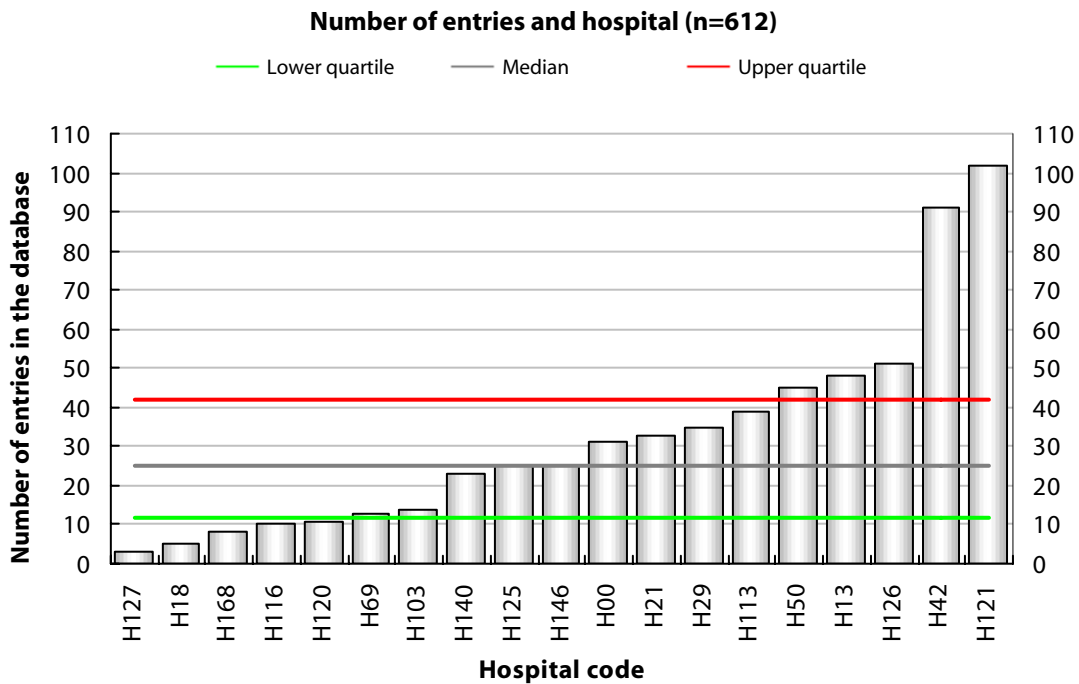
The data presented in the following sections relate to those patient who were reported as having had an operation; this was determined according to: Operation flag = Yes **OR** Date-of-operation is *known* **OR** Type of operation is *known*. Only the records that were imported (those fulfilling the requirements for entry into a PATS registry, *i.e.*, unique patient-identifier **AND** Date-of-initial-investigation present) are included.

Demographics

Demographic and organ of origin

Hospitals and data reported

The median number of resections was 25 during the 12 months from October 2002 (a resection every other week) but only three Hospitals did large numbers (two resections per week) and seven did one a month or less. It will be interesting to see how this changes in future as Cancer Networks re-organise surgical services for Upper GI cancer patients.



AUGIS Audit Report 2004

Organ of origin of cancer

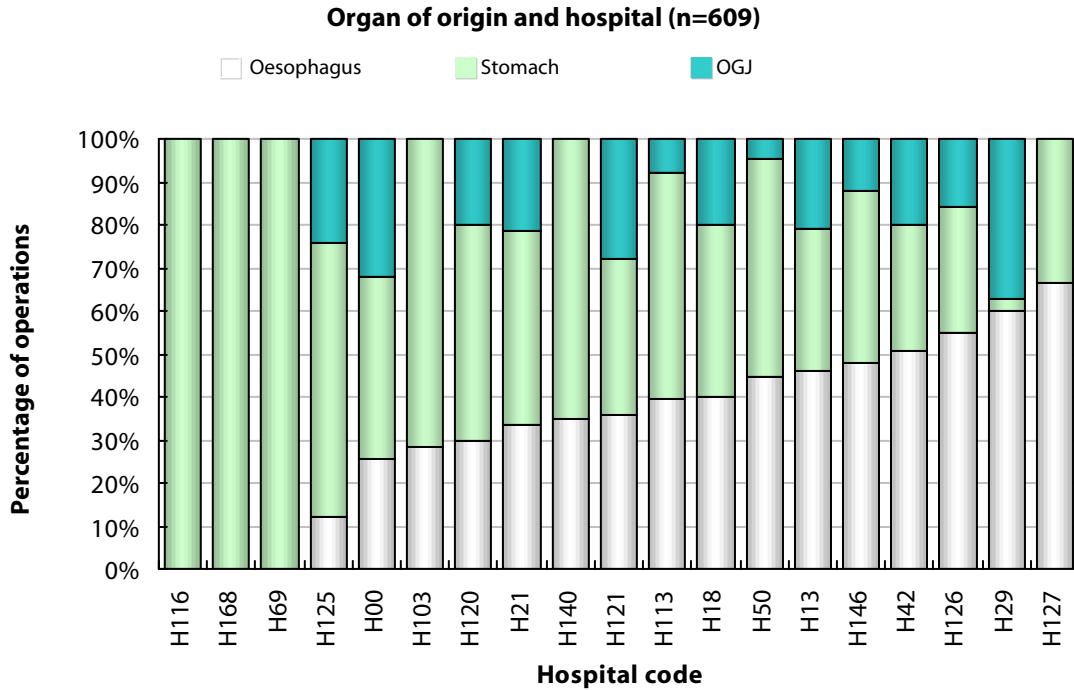
		Organ of origin of cancer				
		Oesophagus	Stomach	OGJ ¹	Unspecified	All
Hospital code	H00	8	13	10	0	31
	H13	22	16	10	0	48
	H18	2	2	1	0	5
	H21	11	15	7	0	33
	H29	21	1	13	0	35
	H42	46	27	18	0	91
	H50	20	23	2	0	45
	H69	0	13	0	0	13
	H103	4	10	0	0	14
	H113	15	20	3	1	39
	H116	0	10	0	0	10
	H120	3	5	2	1	11
	H121	36	37	28	1	102
	H125	3	16	6	0	25
	H126	28	15	8	0	51
	H127	2	1	0	0	3
	H140	8	15	0	0	23
	H146	12	10	3	0	25
	H168	0	8	0	0	8
	All	241	257	111	3	612

Demographics

¹ Oesophageal-Gastric Junction (OGJ)

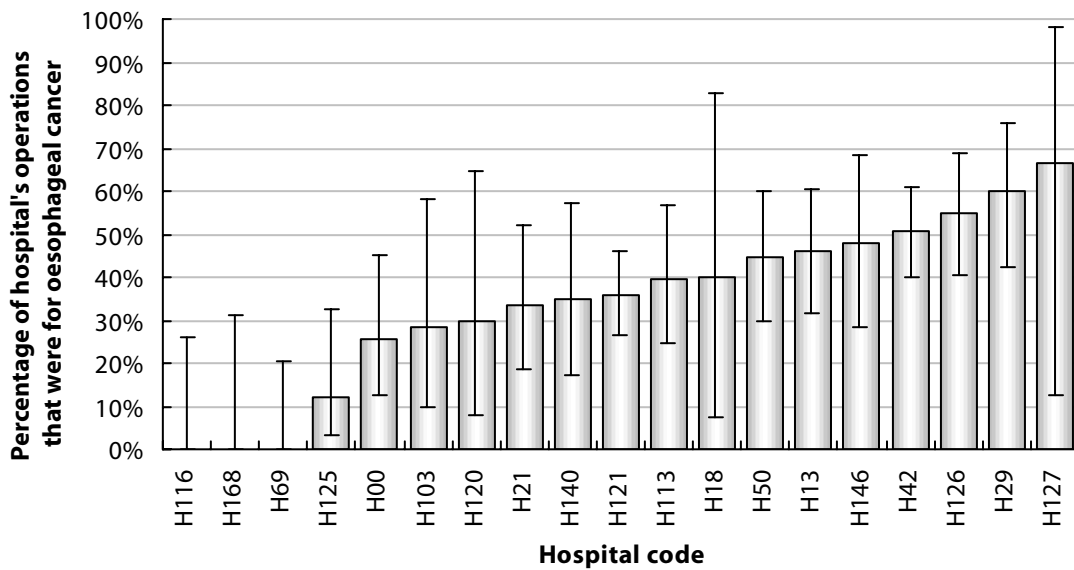
AUGIS Audit Report 2004

Demographics



This analysis depends upon definitions of what is a *Lower third oesophageal* versus *OG junction* tumour. The current AUGIS dataset does not allow discrimination between Siewert type I, II & III junctional adenocarcinomas. It is likely that some Hospitals classify their lower third oesophageal adenocarcinomas as Type I junctional tumours and include them with type II & III as OG junction tumours in their data, whereas others do not. This is an area we shall need to clarify in future.

Operations for oesophageal cancer and hospital (n=609)

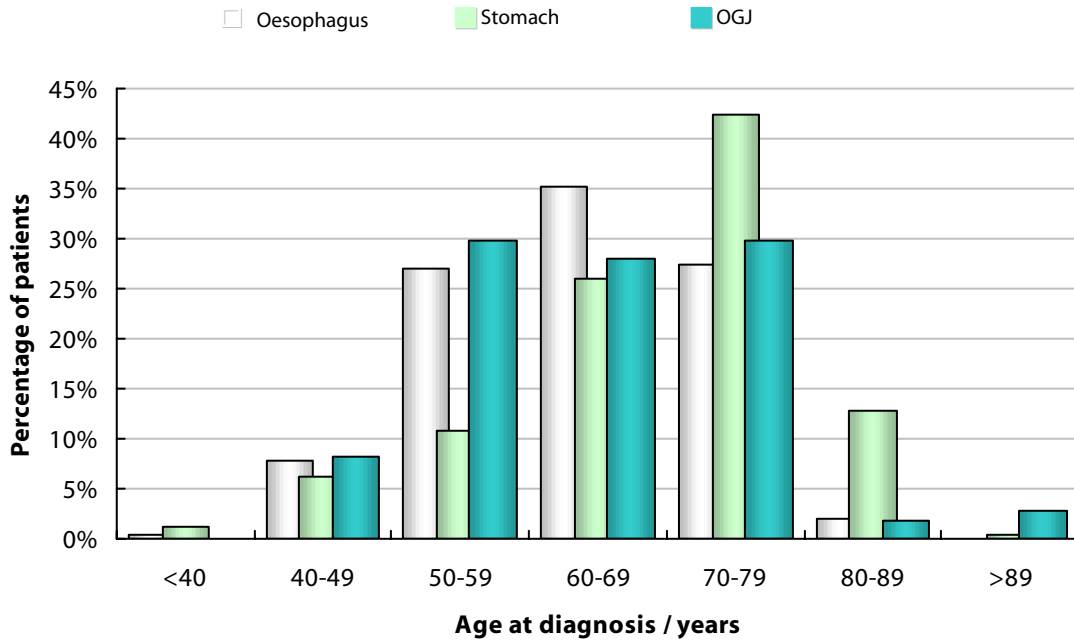


Age at diagnosis

		Site of cancer				
		Oesophagus	Stomach	OGJ	Unspecified	All
Age at diagnosis / years	<40	1	3	0	0	4
	40-49	19	16	9	0	44
	50-59	65	28	33	0	126
	60-69	85	67	31	1	184
	70-79	66	109	33	2	210
	80-89	5	33	2	0	40
	>89	0	1	3	0	4
	Unspecified	0	0	0	0	0
	All	241	257	111	3	612

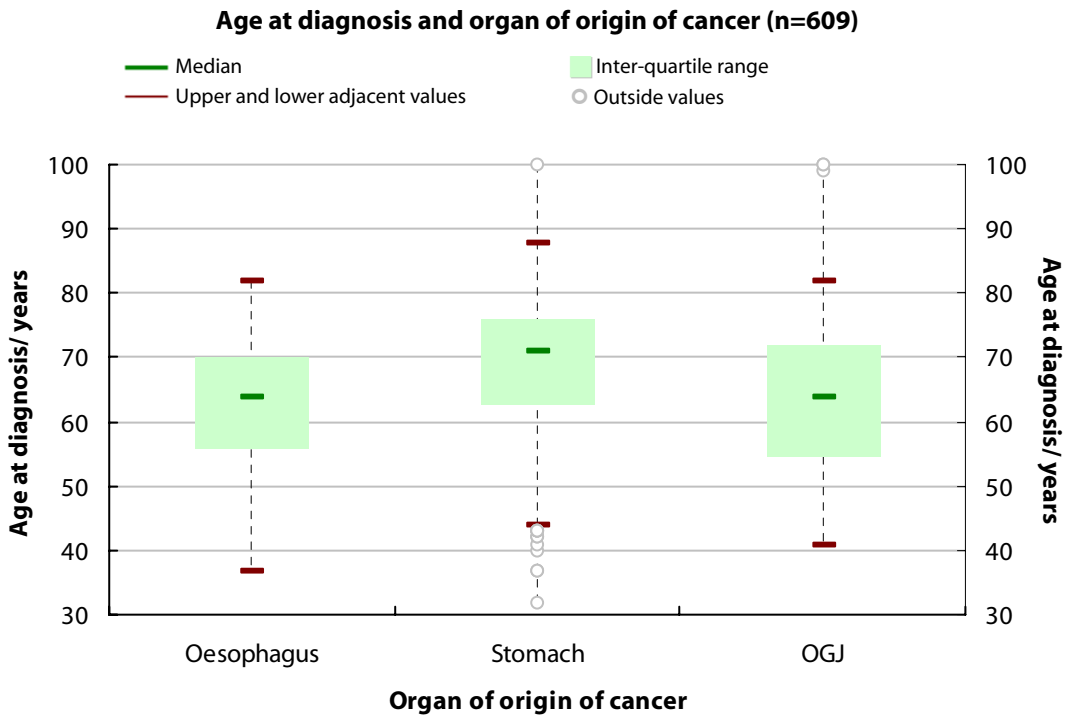
Demographics

Organ of origin and hospital (n=609)

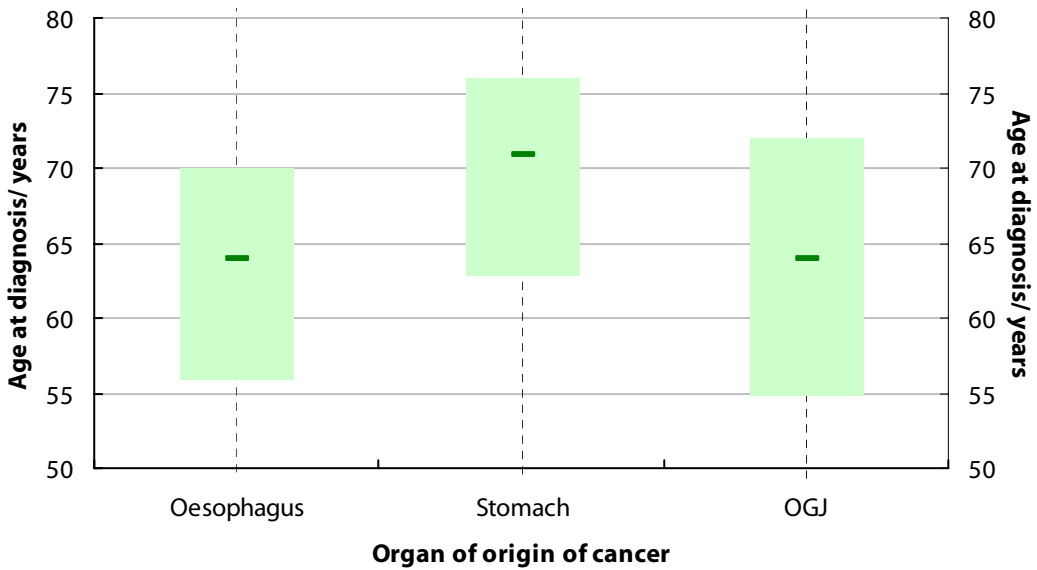


AUGIS Audit Report 2004

Demographics



Focussing in on the inter-quartile range



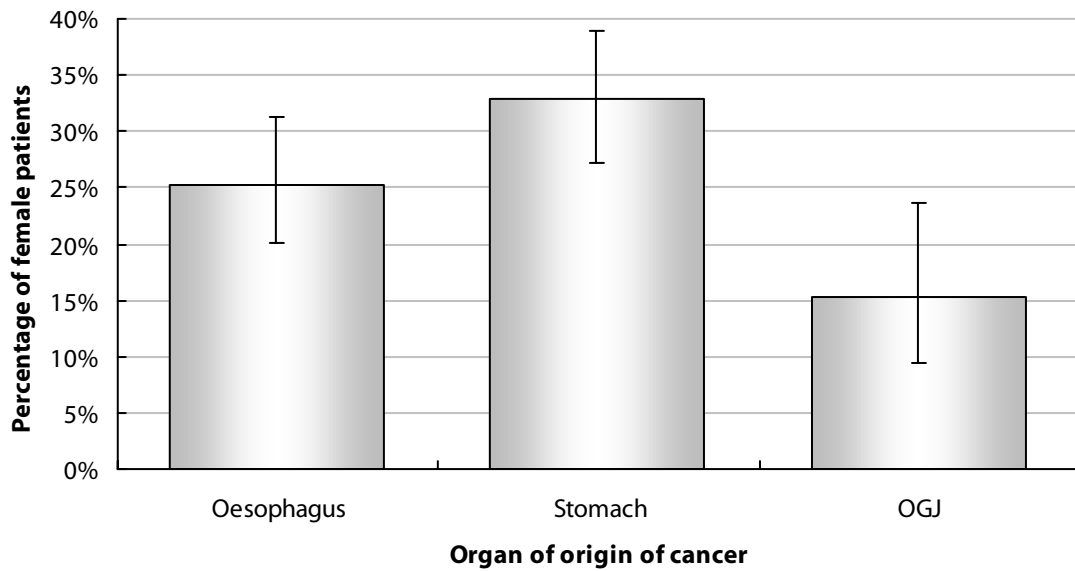
There are no great surprises here, although it is interesting that the group of patients with stomach cancer having surgery seem to be on average 5 years older than those with oesophageal or junctional tumours. It is impossible to investigate this further from the dataset, but this could be due to a range of factors from age at presentation to selection of patients for surgery. Surgeons may be more prepared to take on slightly older patients for resection if the procedure does not involve a thoracotomy.

Gender

		Site of cancer				
		Oesophagus	Stomach	OGJ	Unspecified	All
Gender	Male	180	172	94	2	448
	Female	61	84	17	1	163
	Unspecified	0	1	0	0	1
	All	241	257	111	3	612

Demographics

Proportion of female patients and organ of origin of cancer (n=608)



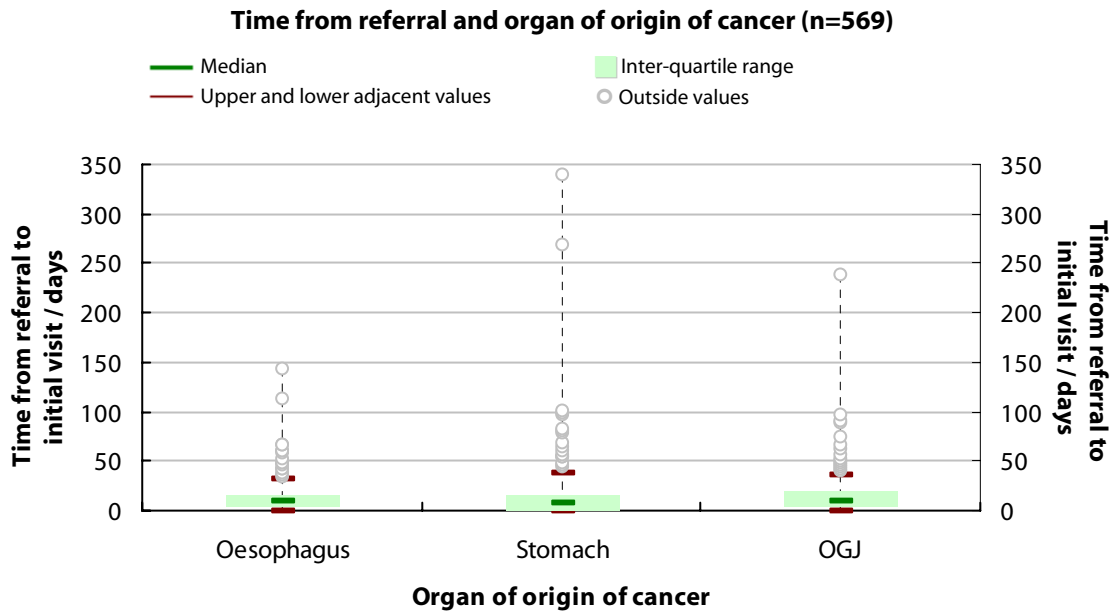
As expected, the majority of patients operated on were men. Women make up over a third of patients having surgery for stomach cancer compared with only 15% for junctional tumours

Process

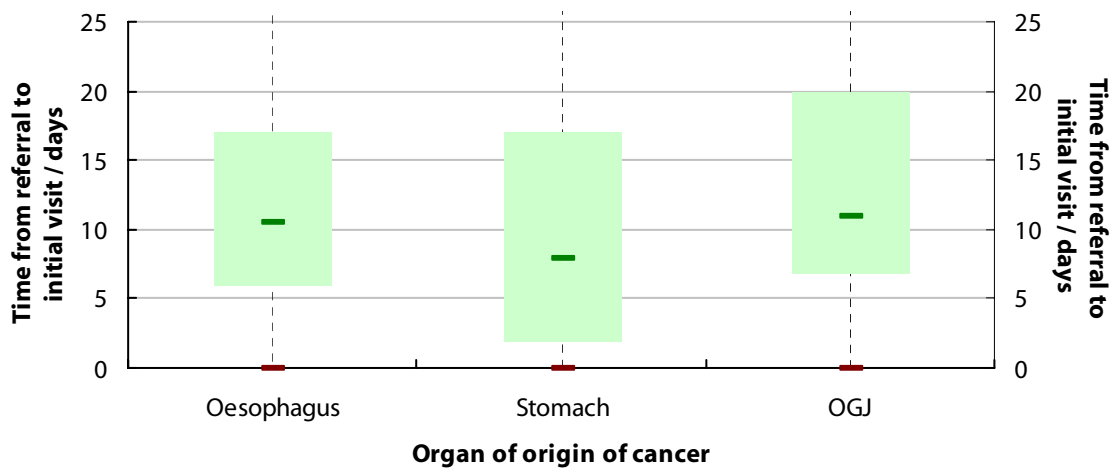
Time from referral to initial visit

Time from referral to initial visit and organ of origin of cancer

Process



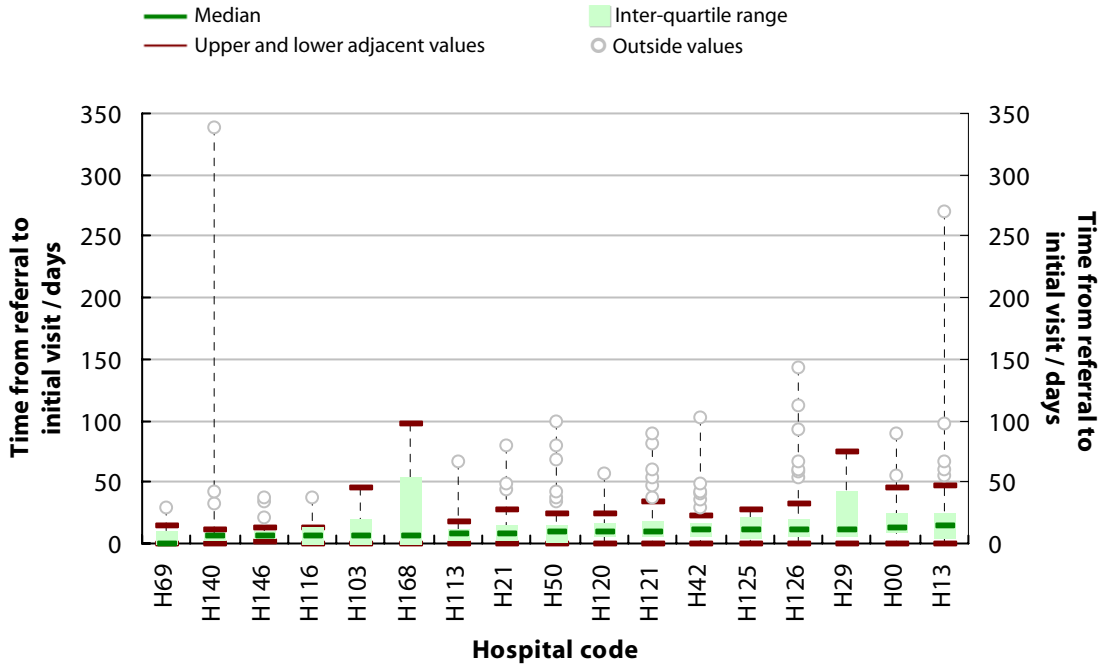
Focussing in on the inter-quartile range



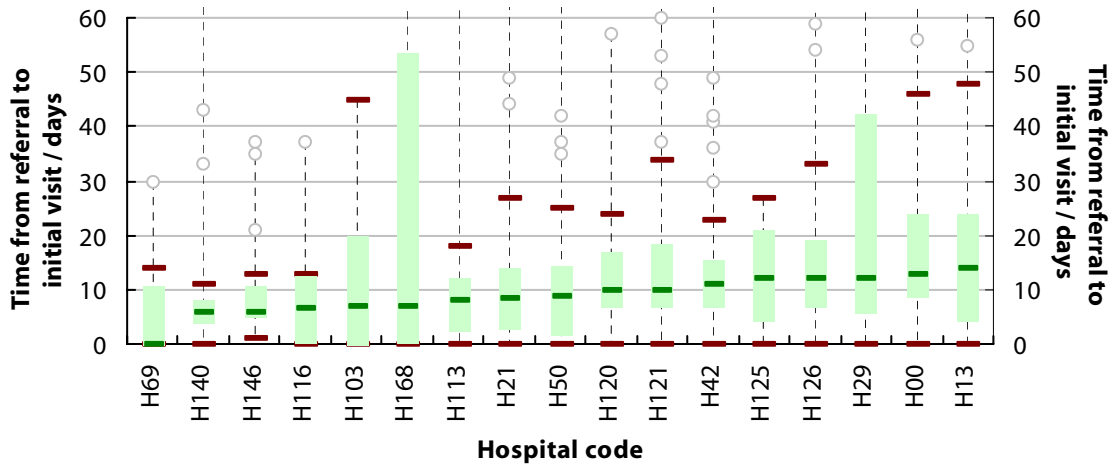
The vast majority of patients are being seen within 11 days of being referred to a surgeon. This is clearly good and suggests that many hospitals have been able to arrange *fast-track* out-patients or endoscopy slots for known and suspected cancer patients. However, there are out-lying cases that waited a lot longer (nearly a year in one case!). Although we do not know the reasons for these we can speculate that some of them were referred as non-fast-track cases without alarm symptoms. Sadly, these cases may be some of the earliest and most easily curable tumours when they first present, but be as advanced as the symptomatic group by the time they are eventually investigated.

Time from referral to initial visit and hospital

Time from referral and hospital (n=566)



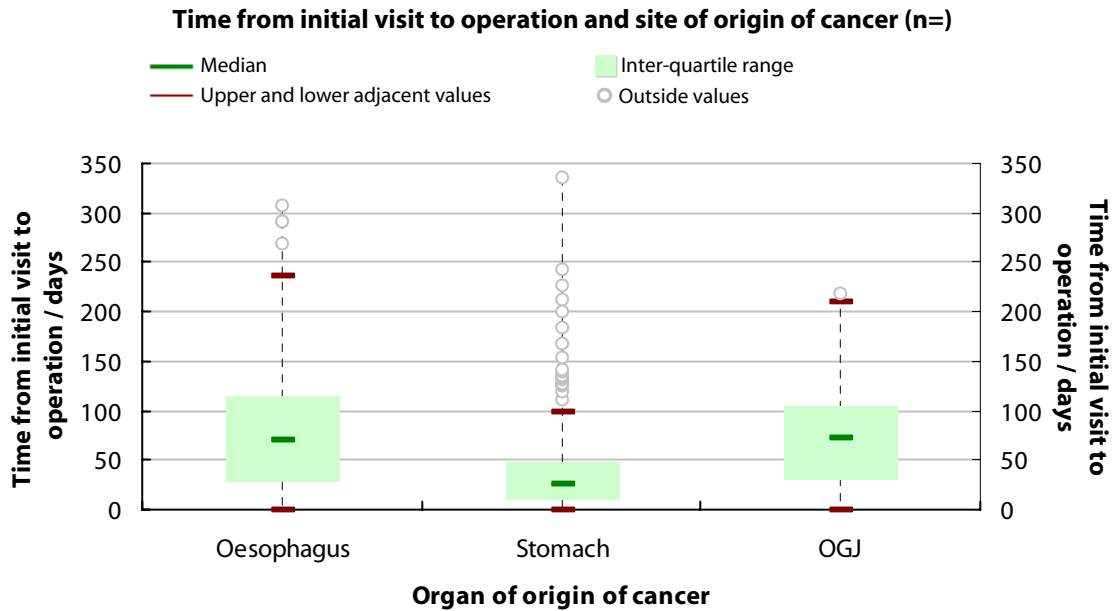
Focussing in on the inter-quartile range



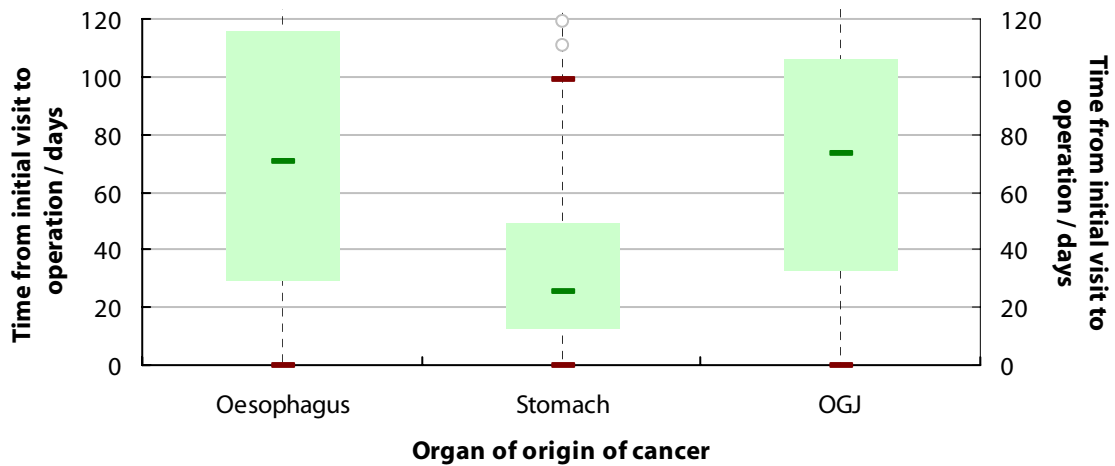
Time from initial visit to operation

Time from initial visit to operation and organ of origin of cancer

Process



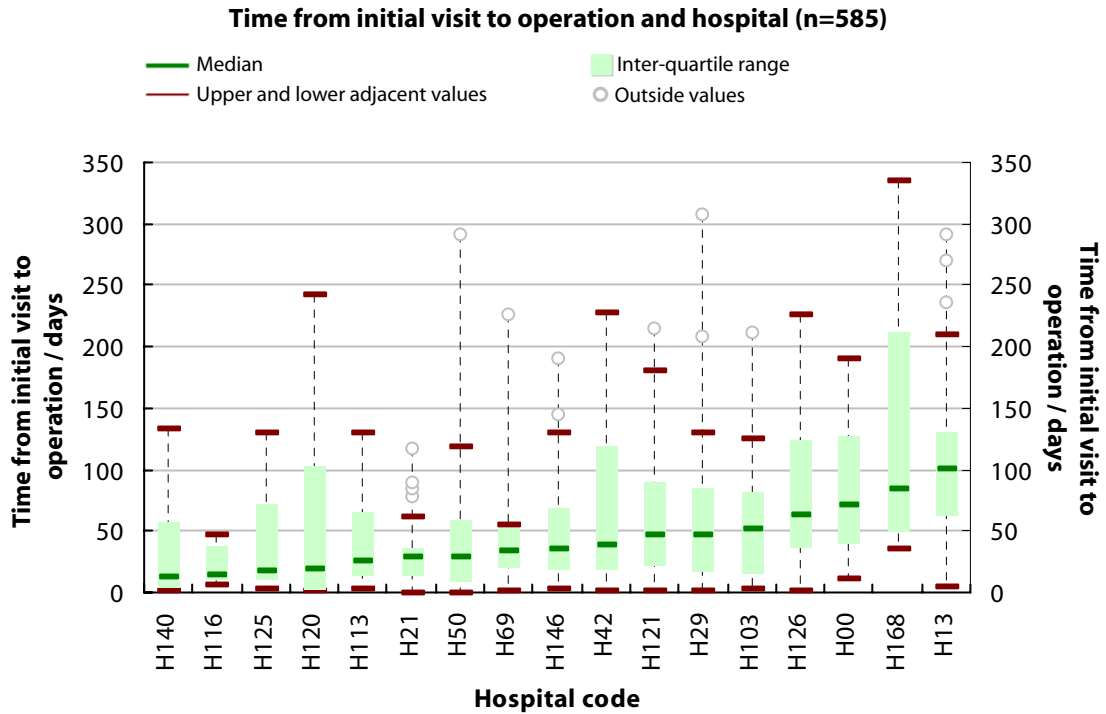
Focussing in on the inter-quartile range



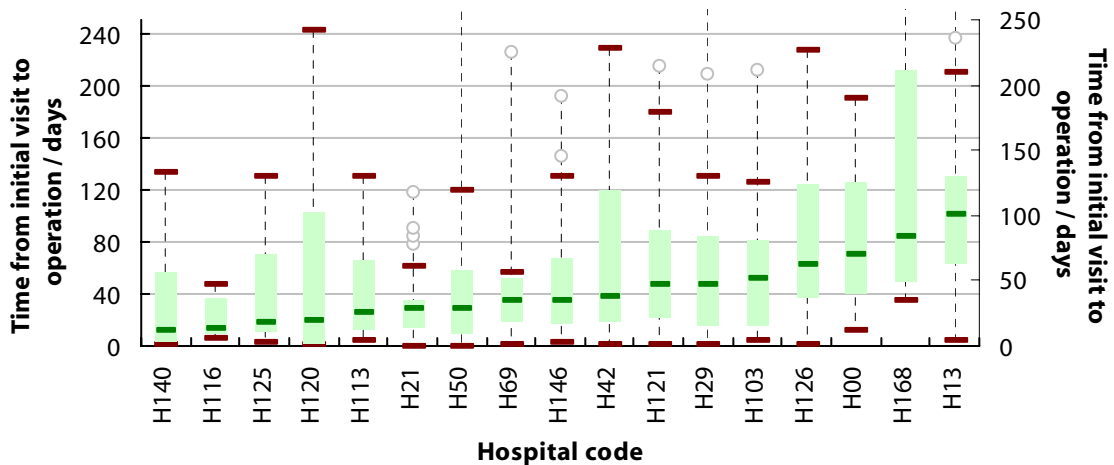
The shorter time waited by patients with stomach cancer probably reflects the smaller proportion of these receiving neo-adjuvant chemo-therapy compared with oesophageal and junctional cancer patients. There are organisational issues here as the two streams of patients, (*i.e.*, those needing neo-adjuvant therapy and those going straight to surgery), have different needs. The former group can have a date planned to follow their chemo-therapy but the later need surgery on the next available list. However, lists may all be booked up with post-chemo-therapy patients causing conflict. Clearly, capacity for surgery is at the heart of this issue and Networks need to model their operating needs carefully when re-organising services.

Time from initial visit to operation and hospital

Process



Focussing in on the inter-quartile range



The Median time to surgery ranges from 10 days to 100 days. Clearly some of this difference is due to casemix with hospitals doing more gastric cancer operating faster but not all the variation can be explained this way. As part of the Peer Review Process, Networks are required to audit this and Department of Health Targets are soon to require that all patients start definitive treatment with 30 days of being seen and 60 days from referral.

AUGIS Audit Report 2004

Diagnosis and staging

ICD-10 classification

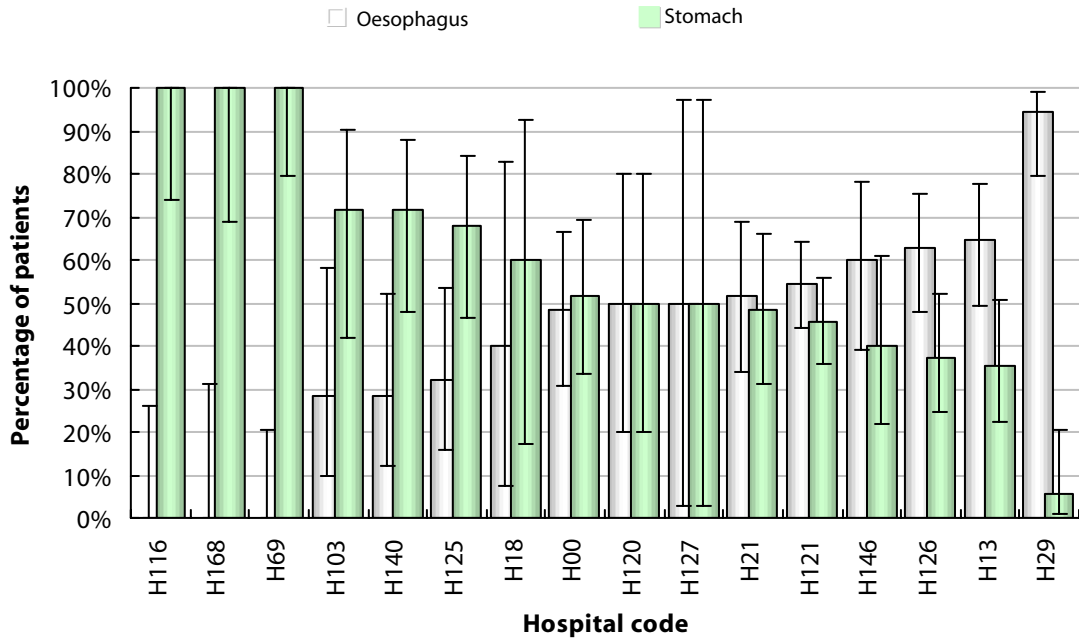
A lot more of these data are missing than are the *Organ of origin* data; these data suggest that 51.9% (n=432; 95% CI: 47.0-56.6%) of the cases reported are oesophageal in origin.

Diagnosis and staging

		ICD-10 diagnosis classification			
		Oesophagus	Stomach	Unspecified	All
Hospital code	H00	15	16	0	31
	H13	31	17	0	48
	H18	2	3	0	5
	H21	17	16	0	33
	H29	33	2	0	35
	H42	0	0	91	91
	H50	0	0	45	45
	H69	0	13	0	13
	H103	4	10	0	14
	H113	0	0	39	39
	H116	0	10	0	10
	H120	5	5	1	11
	H121	55	46	1	102
	H125	8	17	0	25
	H126	32	19	0	51
	H127	1	1	1	3
	H140	6	15	2	23
	H146	15	10	0	25
	H168	0	8	0	8
	All	224	208	180	612

AUGIS Audit Report 2004

ICD-10 diagnosis and hospital (n=432)



Diagnosis and staging

Histological diagnosis

Diagnosis and staging

		Organ of origin of cancer				
		Oesophagus	Stomach	OGJ	Unspecified	All
Histological diagnosis	Normal / Benign	3	5	1	1	10
	ACA	124	199	85	0	408
	HGD	13	5	4	0	22
	Leiomyoma	1	11	0	0	12
	Leiomyosarcoma	0	1	0	0	1
	Lymphoma	0	0	0	0	
	Neuroendocrine	0	2	0	0	2
	SCC	47	0	5	0	52
	Undifferentiated	0	1	0	0	1
	Indeterminate	1	2	0	0	3
	Other	5	4	1	0	10
	Unspecified	49	33	18	2	102
	Patient denominator	241	257	111	3	612

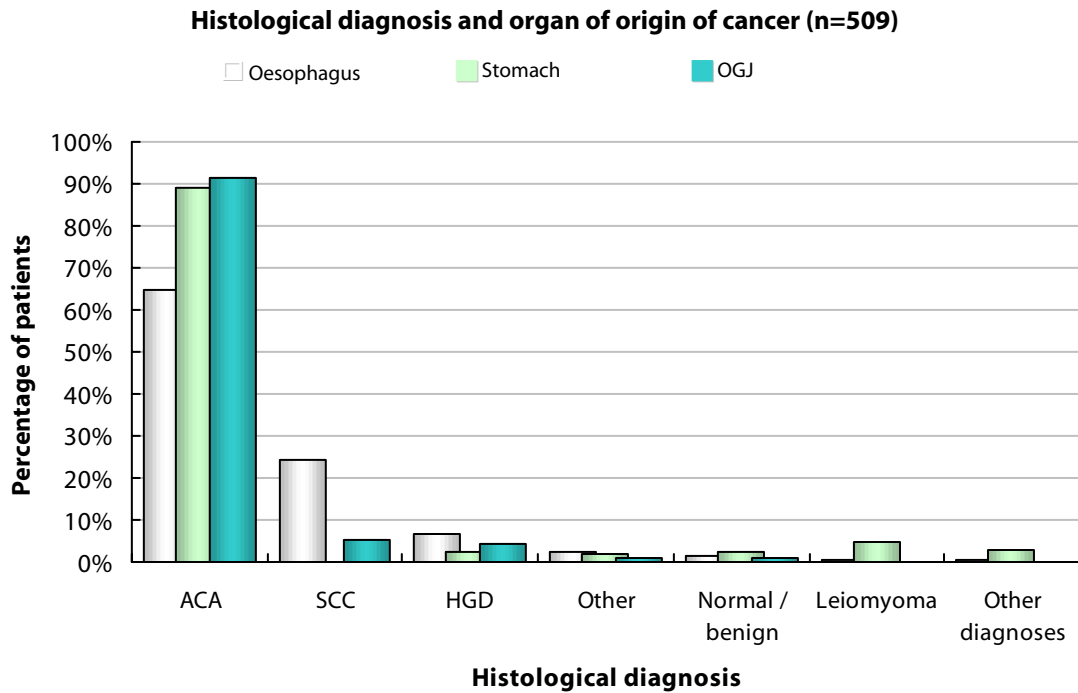
The *Patient denominator* is the number of patients in a group.

Many questions in databases record mutually exclusive data: the responses are either *yes* or *no*, for example. Other kinds of questions in a more complex setup such as the AUGIS database can have more than one response. To take a simplified example, if we were to collect data on the meals taken by each patient during their hospital stay then the data for a single patient might be *Breakfast, Lunch or Breakfast and Lunch*. Reporting such data is a little more difficult than reporting the kind of data that represent mutually exclusive data, because there may be more meals than there are patients, which might look a little odd for a reader who casually glances at a table that records such data.

In an attempt to avoid such confusion, at the foot of these tables, we include a *Patient denominator* (the number of patients in the group and not the total number of response-options) rather than a *Total*. This means that it is possible to work out the rate at which any one of the reported response-options occurs within the population and that the table totals are consistent with those reported elsewhere in the report.

Looking at the entries where the Oesophagus is the organ of origin of cancer, there were 241 patients in the group, 49 of who had no histological diagnosis recorded, leaving 192 patients where the diagnosis is recorded. The total number of known histological diagnoses is 194, which means that one or two patients had more than one histological diagnoses recorded in their database entry.

AUGIS Audit Report 2004



Diagnosis and staging

The majority of oesophageal tumours resected are now Adenocarcinomas. This is a well-known phenomenon, but the speed with which this cancer type has increased in incidence has been truly extraordinary. We are still no closer to understanding it nearly 12 years after it was first appreciated.

AUGIS Audit Report 2004

Management

Multi-disciplinary team (MDT) meeting

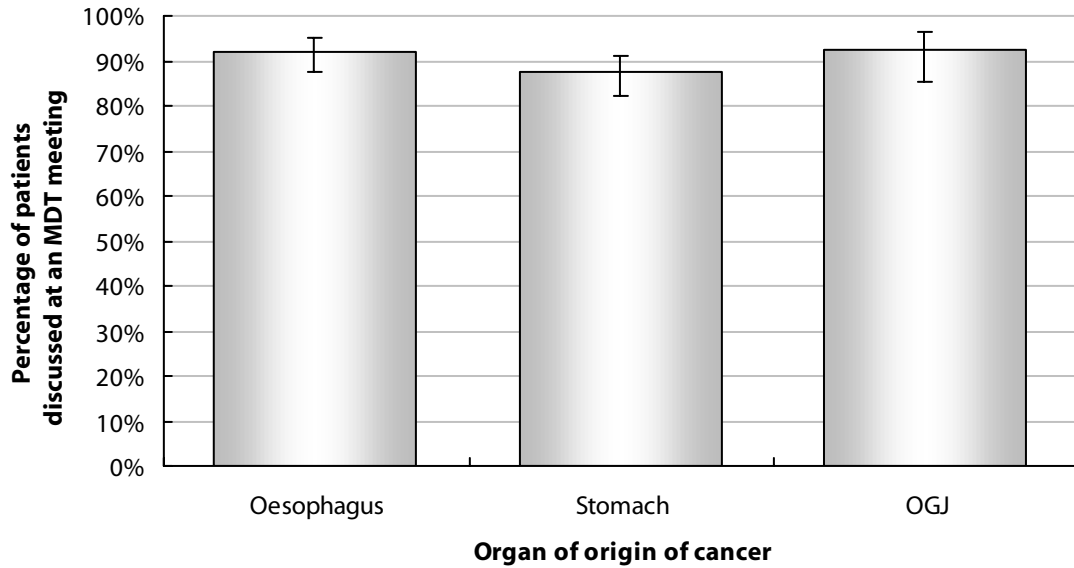
MDT meeting and organ of origin of cancer

Management

Overall rate is 90.2% (n=573; 95% CI: 87.4-92.5%)

		Organ of origin of cancer				
		Oesophagus	Stomach	OGJ	Unspecified	All
MDT meeting	No	18	30	8	0	56
	Yes	208	207	100	2	517
	Unspecified	15	20	3	1	39
	All	241	257	111	3	612

Patient discussed at an MDT and organ of origin of cancer (n=571)



AUGIS Audit Report 2004

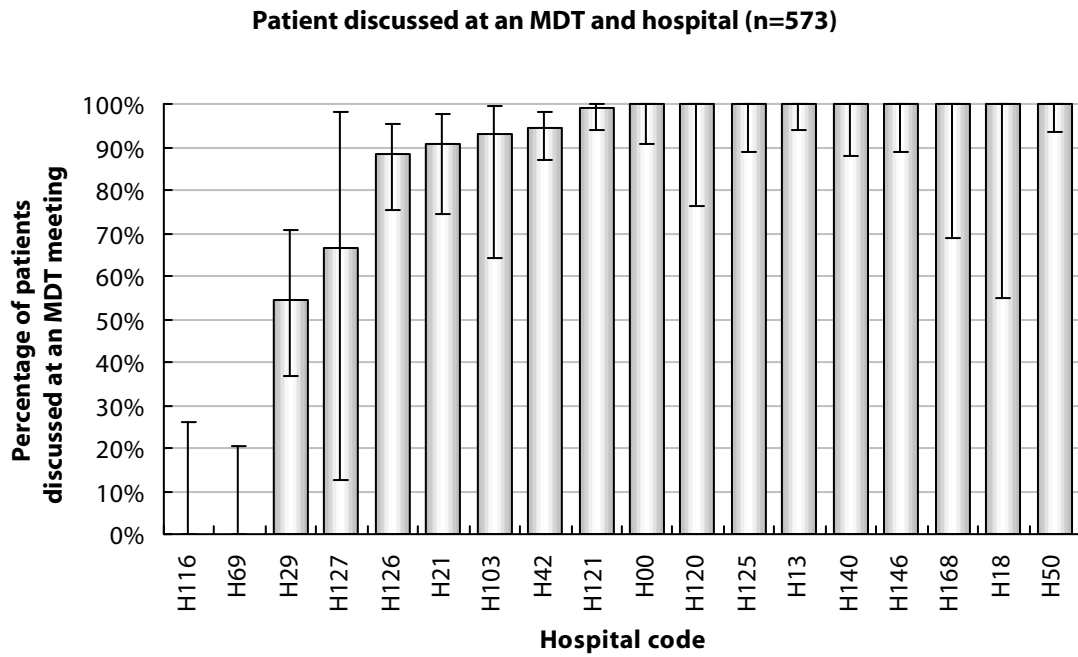
MDT meeting and hospital

		Patient discussed at an MDT meeting			
		No	Yes	Unspecified	All
Hospital code	H00	0	31	0	31
	H13	0	48	0	48
	H18	0	5	0	5
	H21	3	30	0	33
	H29	16	19	0	35
	H42	5	86	0	91
	H50	0	45	0	45
	H69	13	0	0	13
	H103	1	13	0	14
	H113	0	0	39	39
	H116	10	0	0	10
	H120	0	11	0	11
	H121	1	101	0	102
	H125	0	25	0	25
	H126	6	45	0	51
	H127	1	2	0	3
	H140	0	23	0	23
	H146	0	25	0	25
	H168	0	8	0	8
	All	56	517	39	612

Management

AUGIS Audit Report 2004

Management



The majority of Hospitals are following current guidelines and discussing all their cases in an MDT meeting. However, there are some notable exceptions.

AUGIS Audit Report 2004

Pre-treatment stage

I have calculated these from the data as follows (I asked Sharon, so I can't take any credit for this):

Gastric	Oesophageal
4 Any M1, Any N3 or T4N2M0	4 Any M1
1a T1N0M0	1 T1N0M0
1b T1N2M0, T2N0M0	2a T2N0M0, T3N0M0
2 T1N2M0, T2N1M0, T3N0M0	2b T2N1M0, T1N1M0
3a T2N2M0, T3N1M0, T4N0M0	3 T3N1M0, T4N1M0
3b T3N2M0, T4N1M0	

Management

		Organ of origin of cancer ²	
		Oesophageal	Gastric
Pre-treatment stage	1	35	NA ³
	1a	NA	16
	1b	NA	36
	2	NA	50
	2a	68	NA
	2b	15	NA
	3	115	NA
	3a	NA	41
	3b	NA	10
	4	3	18
	Unspecified	73	105
	All	309	276

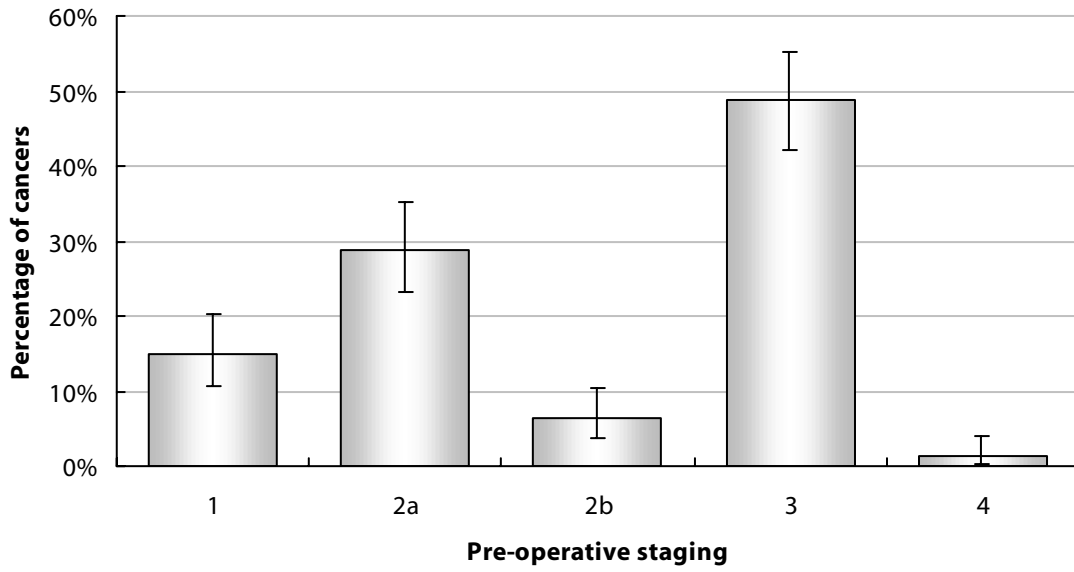
² Some of the OGJ tumours are included here as the ICD-10n diagnosis code allows us to ascribe them accordingly into one of the two groups

³ NA = Not Applicable; each cancer site has its own staging system; some stages apply to only one site. Data are not missing but, rather, genuinely not applicable.

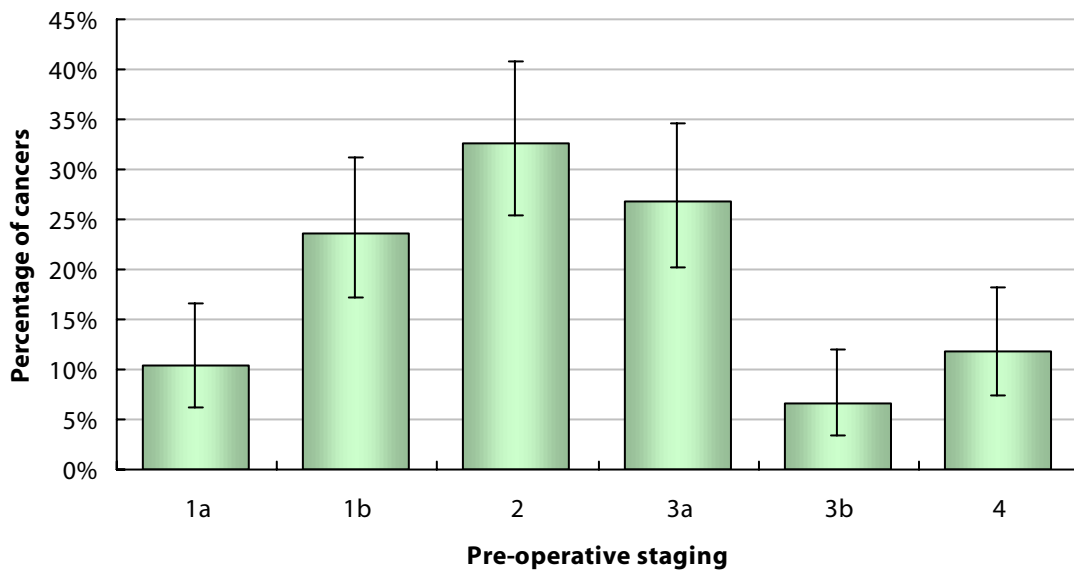
AUGIS Audit Report 2004

Management

Pre-operative staging for oesophageal cancers (n=236)



Pre-operative staging for gastric cancers (n=171)



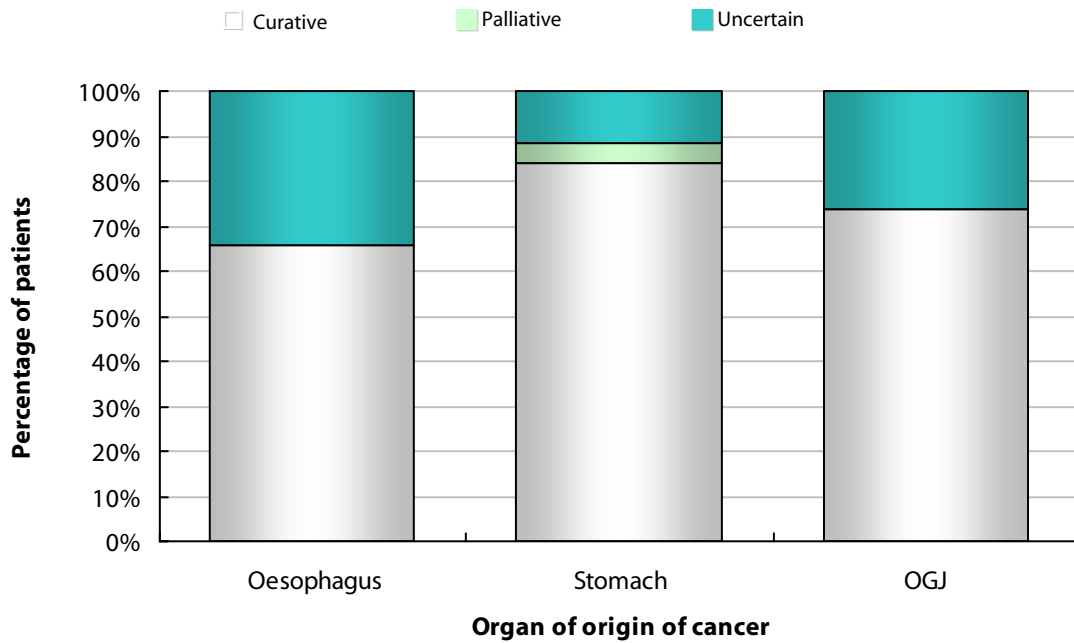
AUGIS Audit Report 2004

Treatment intent

		Organ of origin of cancer				
		Oesophagus	Stomach	OGJ	Unspecified	All
Treatment intent	Curative	29	57	28	0	114
	Palliative	0	3	0	0	3
	Uncertain	15	8	10	0	33
	Unspecified	197	189	73	3	462
	All	241	257	111	3	612

Management

Treatment intent and organ of origin of cancer (n=150)



AUGIS Audit Report 2004

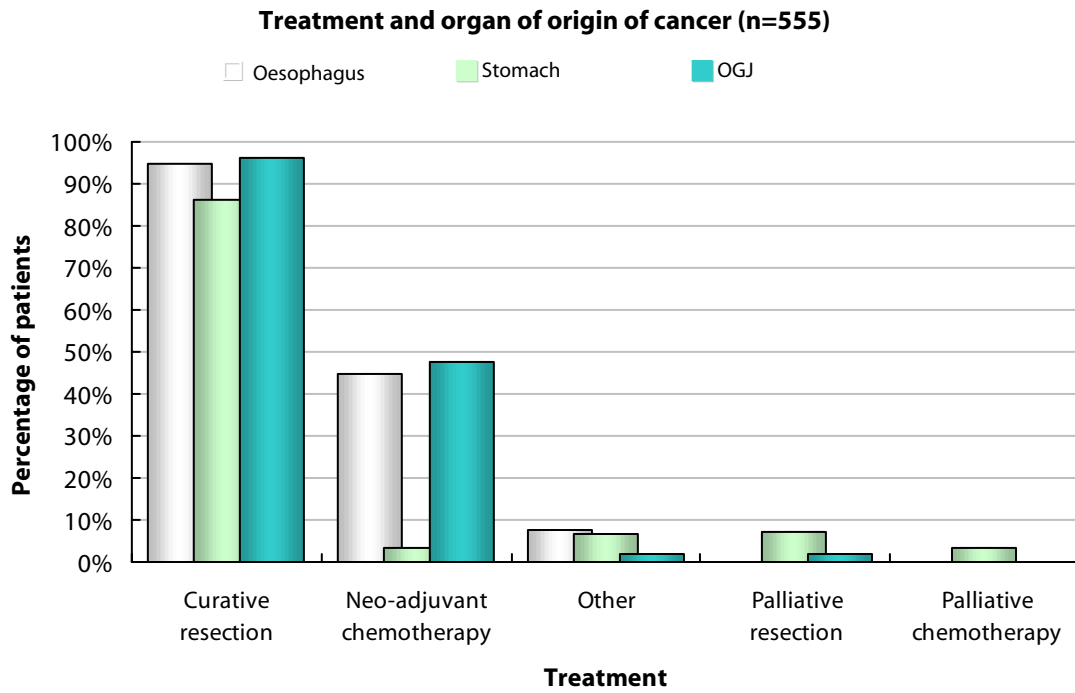
Treatment

These results show that palliative resection for oesophageal cancer has been rightly abandoned, but that there are still some patients with gastric cancer who were felt to benefit from palliative resection. Having said this, the role of surgery in the palliation of gastric cancer is controversial and may be an area for research by AUGIS in the future.

Management

		Site of cancer				All
		Oesophagus	Stomach	OGJ	Unspecified	
Treatment	None	1	0	0	0	1
	Palliative resection	0	16	2	0	18
	Stent	3	2	1	0	6
	Neo-adjuvant CT	99	8	49	0	156
	Neo-adjuvant RT	3	0	2	0	5
	Palliative CT	0	8	0	0	8
	Palliative RT	4	0	0	0	4
	Laser	0	2	0	0	2
	Palliative care	1	0	0	0	1
	Palliative RT	0	6	0	0	6
	Curative resection	210	198	99	1	508
	Laposcopic resection	0	1	0	0	1
	Other	17	15	2	0	34
	Unspecified	19	27	8	2	56
	Patient denominator	241	257	111	3	612

AUGIS Audit Report 2004



Management

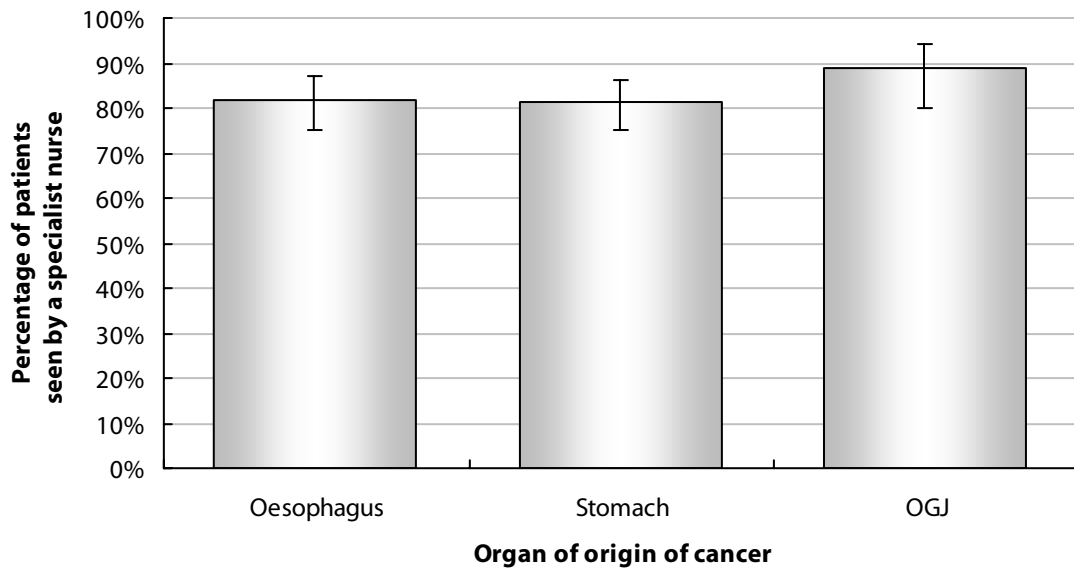
Seen by a specialist nurse

Seen by a specialist nurse and organ of origin of cancer

Management

		Organ of origin of disease				
		Oesophagus	Stomach	OGJ	Unspecified	All
Seen by a specialist nurse	Yes	32	38	10	1	81
	No	145	167	80	1	393
	Unspecified	64	52	21	1	138
	All	241	257	111	3	612

Patient seen by a specialist nurse and organ of origin of cancer (n=472)



AUGIS Audit Report 2004

Seen by a specialist nurse and hospital

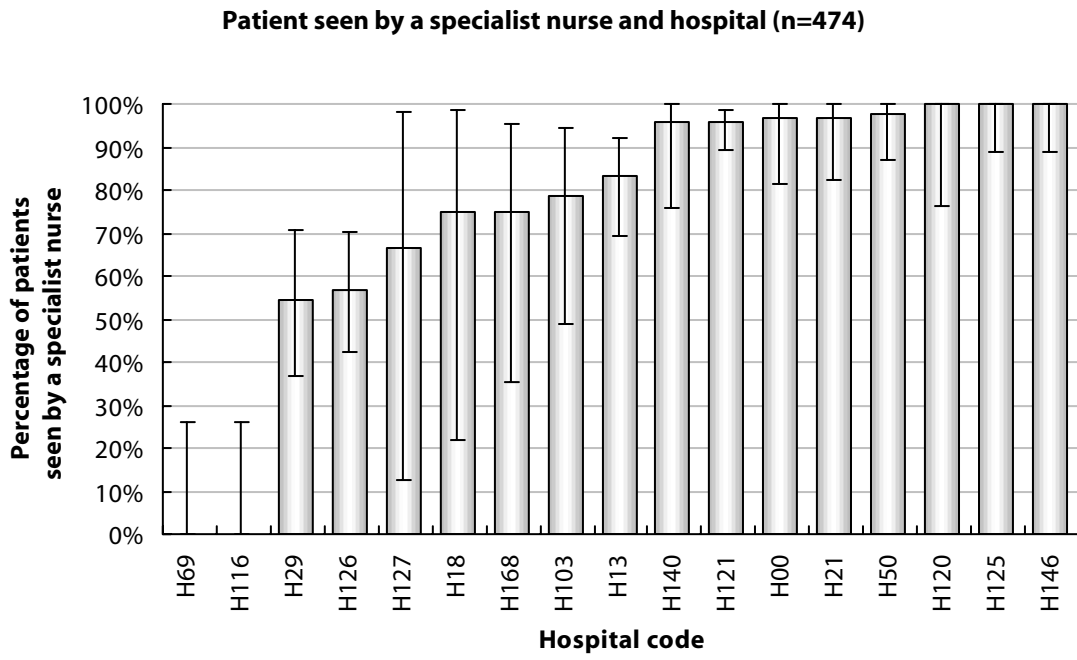
Two Hospitals appeared not to have Specialist nurses at the time of the audit and seven others were unable to get their Specialist nurse involved in all of their cases. However, the majority of patients did have the benefit of the skills and time of this essential team member

		Patient seen by a specialist nurse			
		No	Yes	Unspecified	All
Hospital code	H00	1	30	0	31
	H13	8	40	0	48
	H18	1	3	1	5
	H21	1	32	0	33
	H29	16	19	0	35
	H42	0	0	91	91
	H50	1	44	0	45
	H69	10	0	3	13
	H103	3	11	0	14
	H113	0	0	39	39
	H116	10	0	0	10
	H120	0	11	0	11
	H121	4	94	4	102
	H125	0	25	0	25
	H126	22	29	0	51
	H127	1	2	0	3
	H140	1	22	0	23
	H146	0	25	0	25
	H168	2	6	0	8
	All	81	393	138	612

Management

AUGIS Audit Report 2004

Management



AUGIS Audit Report 2004

Operation

		Site of cancer				
		Oesophagus	Stomach	OGJ	Unspecified	All
Operation	Total gastrectomy	1	93	16	3	113
	Sub-total gastrectomy	0	84	0	0	84
	Completion gastrectomy	0	4	0	0	4
	Extended total gastrectomy	0	4	5	0	9
	Partial gastrectomy	0	38	0	0	38
	Right 2 phase sub-total oesophagectomy	139	1	52	0	192
	Left thoraco-ADBOMINAL oesophagectomy	23	3	20	0	46
	McKeown 3-stage sub-total oesophagectomy	10	0	1	0	11
	Trans-hiatal oesophagectomy	43	3	12	0	58
	Laparotomy only	11	11	1	0	23
	Laparotomy and thoracotomy	1	0	0	0	1
	Jejunostomy	32	11	24	1	68
	Wedge / localised resection	2	3	1	0	6
	Oesophagectomy unspecified	7	0	2	0	9
	Other	33	44	25	1	103
	Unspecified	3	0	0	0	3
	Patient denominator	241	257	111	3	612

Management

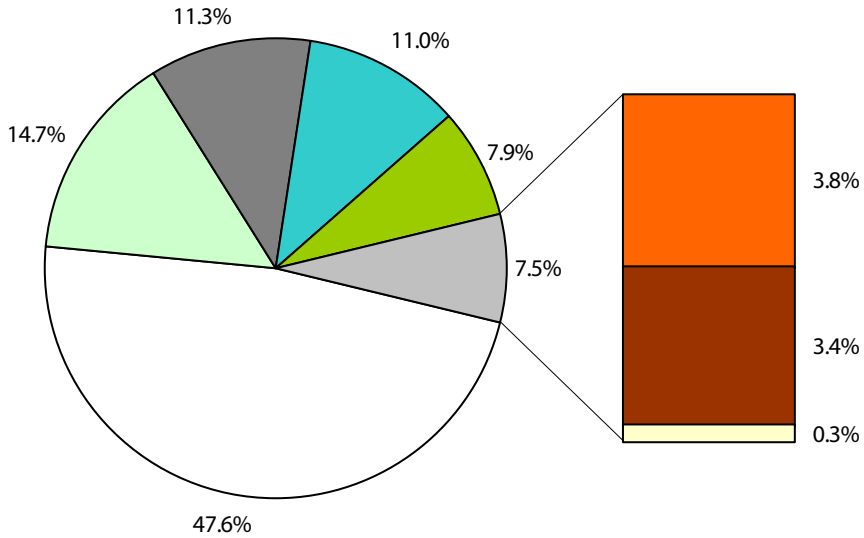
AUGIS Audit Report 2004

Management

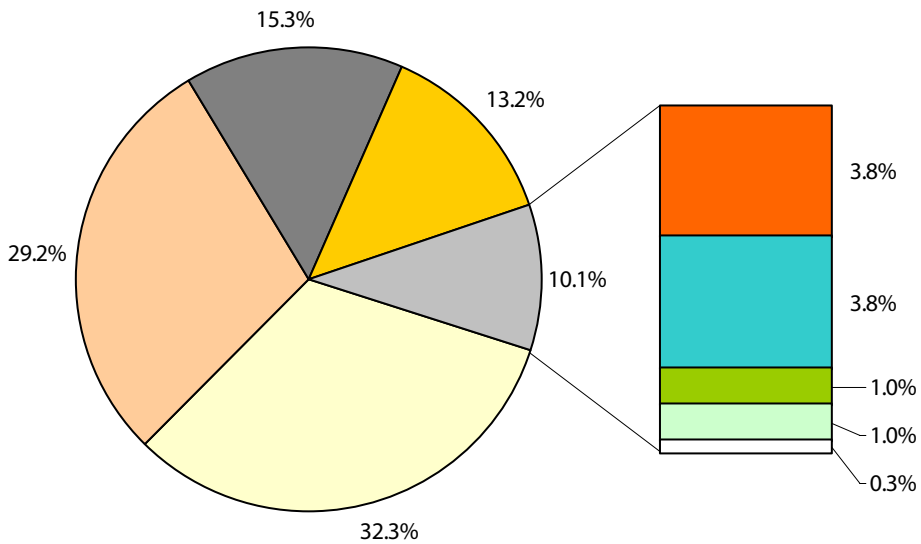
Type of operation (n=238 and n=257 respectively)

- | | |
|---|---|
| <ul style="list-style-type: none"> Right 2 phase sub-total oesophagectomy Trans-hiatal oesophagectomy Other operations Jejunostomy Left thoraco-abdominal oesophagectomy Others (relatively small volume operations; detailed in bar) | <ul style="list-style-type: none"> Total gastrectomy Sub-total gastrectomy Partial gastrectomy Laparotomy only McKeown 3-stage sub-total oesophagectomy |
|---|---|

Oesophagus



Stomach

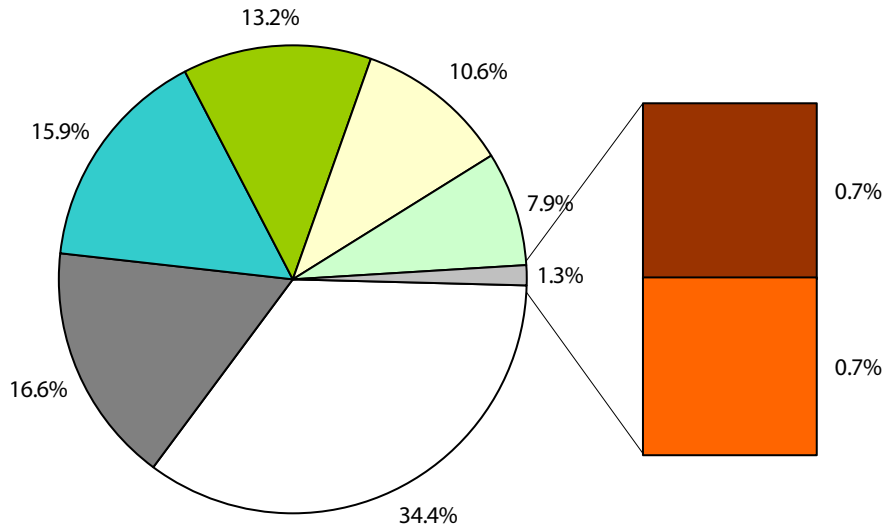


AUGIS Audit Report 2004

Type of operation (n=111)

- | | |
|---|---|
| <ul style="list-style-type: none"> Right 2 phase sub-total oesophagectomy Trans-hiatal oesophagectomy Other operations Jejunostomy Left thoraco-ADBominal oesophagectomy Others (relatively small volume operations; detailed in bar) | <ul style="list-style-type: none"> Total gastrectomy Sub-total gastrectomy Partial gastrectomy Laparotomy only McKeown 3-stage sub-total oesophagectomy |
|---|---|

OGJ



Only 23 patients in this audit had an *open & close* laparotomy. This is a great improvement compared with historical data and reflects the considerable efforts made to stage tumours effectively. The difference between *partial* and *sub-total gastrectomy* is not clear in the database and these should be merged in future versions.

AUGIS Audit Report 2004

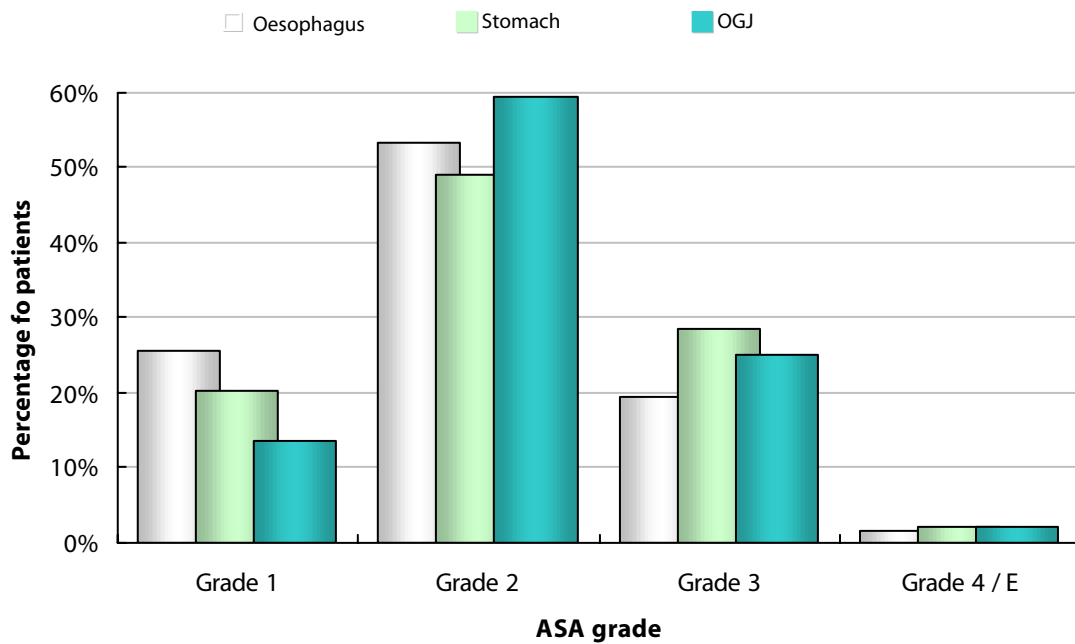
ASA grade

ASA grade and organ of origin of cancer

Management

		Organ of origin of cancer				
		Oesophagus	Stomach	OGJ	Unspecified	All
ASA grade	Grade 1	47	39	13	0	99
	Grade 2	98	94	57	1	250
	Grade 3	36	55	24	1	116
	Grade 4	2	2	0	0	4
	Grade E	1	2	2	0	5
	Unspecified	57	65	15	1	138
	All	241	257	111	3	612

ASA grade and organ of origin of cancer (n=472)



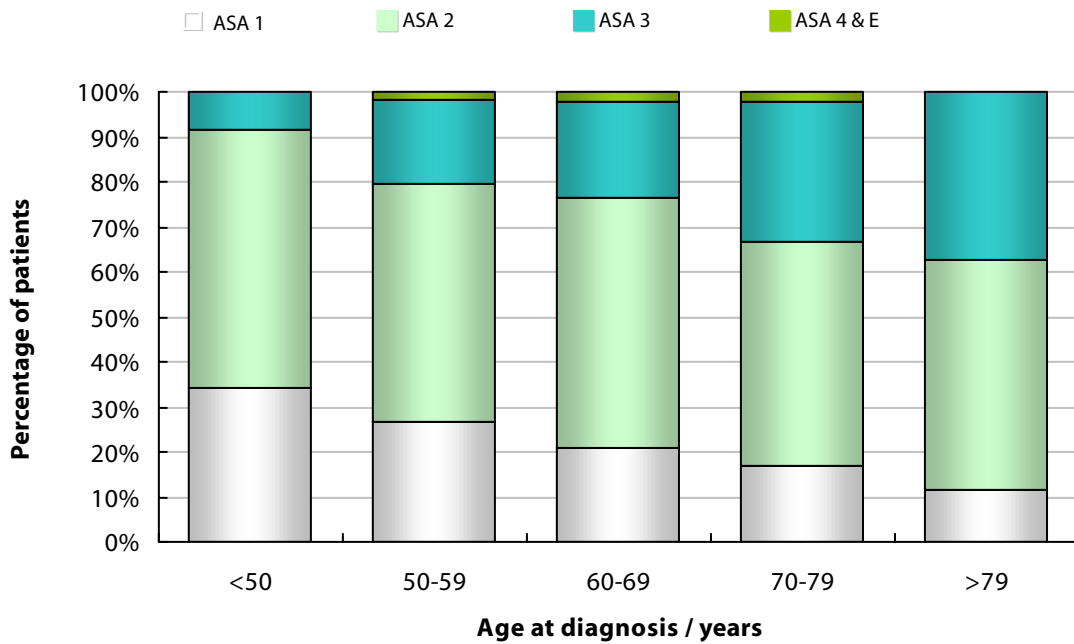
ASA is a notoriously crude estimation of patient fitness, but the noticeable finding here is the small proportion of patients who were ASA 1 and the relatively large number (approximately 25%) who were ASA 3 (significant co-morbidities).

ASA grade and age

		Age at diagnosis / years						Unspecified	All
		<50	50-59	60-69	70-79	>79			
ASA grade	Grade 1	12	27	28	28	4	0	99	
	Grade 2	20	54	75	83	18	0	250	
	Grade 3	3	19	29	52	13	0	116	
	Grade 4	0	0	3	1	0	0	4	
	Grade E	0	2	0	3	0	0	5	
	Unspecified	13	24	49	43	9	0	138	
	All	48	126	184	210	44	0	612	

Management

ASA grade and age at diagnosis (n=474)

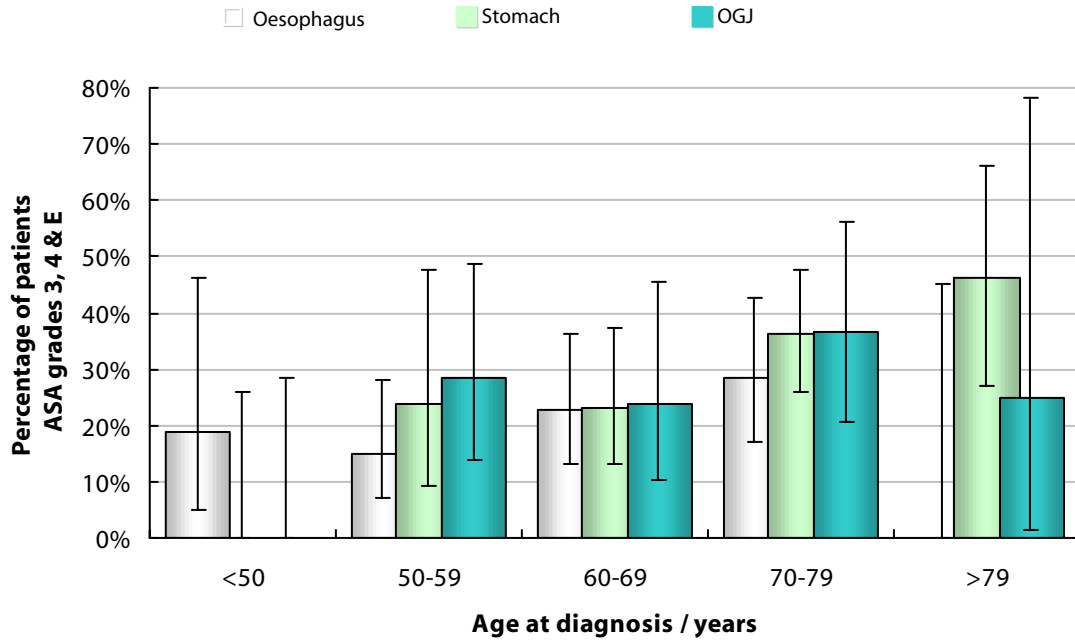


Traditionally a disease of the 6th, 7th and 8th decades, oesophago-gastric cancer is relatively rare in younger patients. It is interesting therefore to see that nearly one-third of this operative cohort of patients were less than sixty years old.

AUGIS Audit Report 2004

ASA grade, organ of origin of cancer and age at diagnosis (n=472)

Management



AUGIS Audit Report 2004

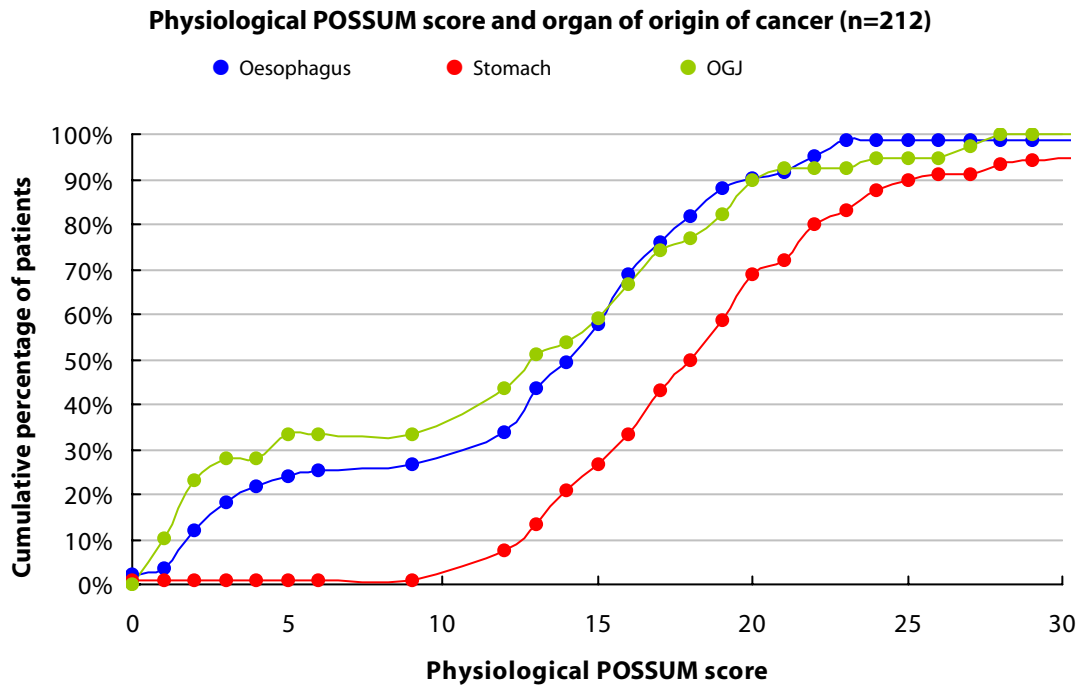
Physiological POSSUM score

		Organ of origin of cancer				
		Oesophagus	Stomach	OGJ	Unspecified	All
Physiological POSSUM score	0	2	1	0	0	3
	1	1	0	4	0	5
	2	7	0	5	0	12
	3	5	0	2	0	7
	4	3	0	0	0	3
	5	2	0	2	0	4
	6	1	0	0	0	1
	9	1	0	0	0	1
	12	6	6	4	0	16
	13	8	5	3	0	16
	14	5	7	1	0	13
	15	7	5	2	0	14
	16	9	6	3	0	18
	17	6	9	3	0	18
	18	5	6	1	0	12
	19	5	8	2	0	15
	20	2	9	3	0	14
	21	1	3	1	0	5
	22	3	7	0	0	10
	23	3	3	0	0	6
	24	0	4	1	0	5
	25	0	2	0	0	2
	26	0	1	0	0	1
	27	0	0	1	0	1
	28	0	2	1	0	3
	29	0	1	0	0	1
	33	0	1	0	0	1
	34	0	1	0	0	1
	36	0	2	0	0	2
	38	1	0	0	0	1
	41	0	1	0	0	1
	Unspecified	158	167	72	3	400
	All	241	257	111	3	612

Management

AUGIS Audit Report 2004

Management



POSSUM scoring has been shown to over-estimate the risk of perioperative mortality and P-POSSUM is often used instead as it has a corrective factor for elective surgery where mortalities are generally lower. O-POSSUM, a variation on this, is designed to assess risk for patients having an oesophagectomy. However, no full POSSUM scoring was possible in this audit due to incomplete data submission. The physiology component of the score can be used alone to assess risk but again, only 212 patients had complete physiology scores so this was not useable either

Pathology

Pathology

		Organ of origin of cancer ⁴	
		Oesophageal	Gastric
Post-treatment stage	0	13	4
	1	39	NA ⁵
	1a	NA	17
	1b	NA	25
	2	NA	50
	2a	34	NA
	2b	20	NA
	3	95	NA
	3a	NA	23
	3b	NA	20
	4	6	14
	HGD	3	NA
	Unspecified	99	123
	All	309	276

There are 52 patients who had an oesophagectomy for stage 0-1 disease. Their prognosis should be good. They probably reflect a mixed population of those who have had a significant response to neo-adjuvant therapy and those whose tumours have been detected early through surveillance endoscopy for Barrett's. The 48 early gastric tumours appear to have been detected early rather than down-staged by neo-adjuvant therapy, reflecting the infrequent use of multi-modal therapy for gastric cancer. Unfortunately, there are again a large proportion of unspecified cases (222).

Looking at the 52 oesophageal patients with stage 0-1:

No neo-adjuvant CT, No neo-adjuvant RT	40	76.9% (n=52; 95% CI: 62.8-87.0%)
Neo-adjuvant CT	11	21.2% (n=52; 95% CI: 11.5-35.1%)
Neo-adjuvant RT	0	0.0% (n=52; 95% CI: 0.0-5.6%)
Neo-adjuvant CT and neo-adjuvant RT	1	1.9% (n=52; 95% CI: 0.1-11.6%)

Looking at the 46 gastric patients with stage 0-1:

No neo-adjuvant CT, No neo-adjuvant RT	44	95.7% (n=46; 95% CI: 84.0-99.2%)
Neo-adjuvant CT	2	4.3% (n=46; 95% CI: 0.8-16.0%)
Neo-adjuvant RT	0	0.0% (n=46; 95% CI: 0.0-6.3%)
Neo-adjuvant CT and neo-adjuvant RT	0	0.0% (n=46; 95% CI: 0.0-6.3%)

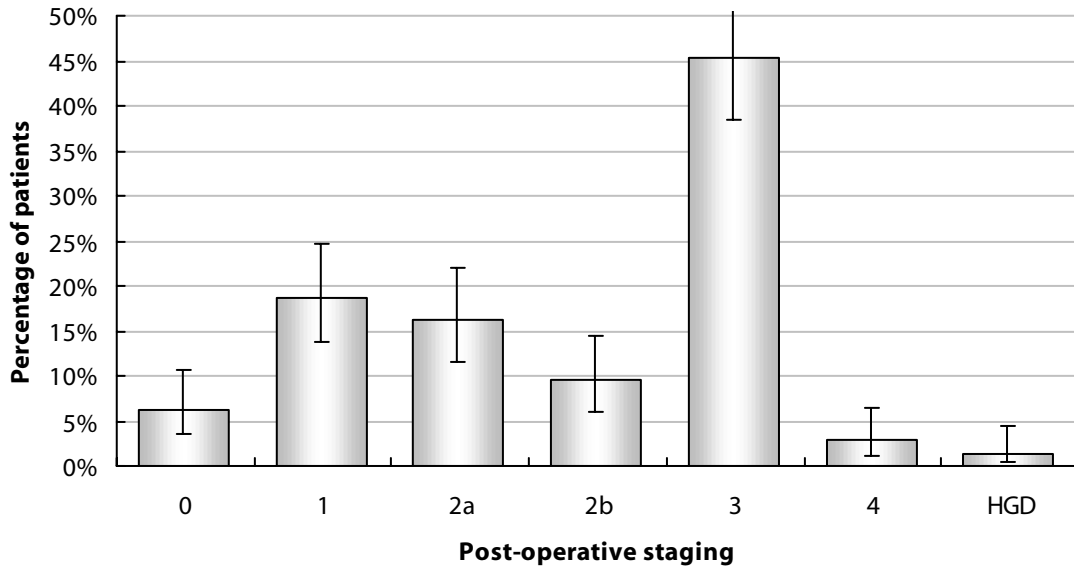
⁴ Some of the OGJ tumours are included here as the ICD-10n diagnosis code allows us to ascribe them accordingly into one of the two groups

⁵ NA = Not Applicable; each cancer site has its own staging system; some stages apply to only one site. Data are not missing but, rather, genuinely not applicable.

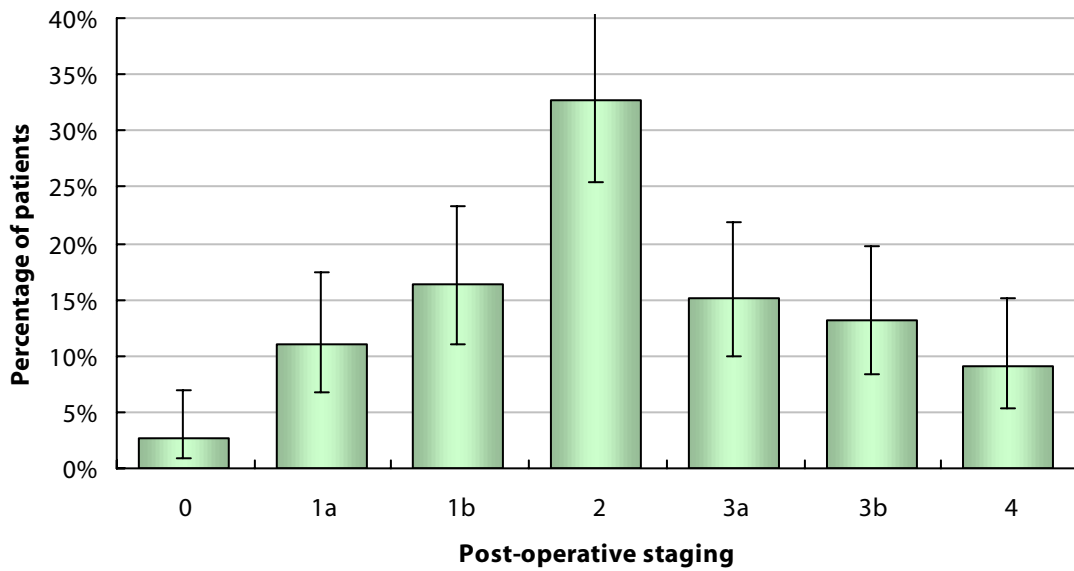
AUGIS Audit Report 2004

Pathology

Post-operative staging for oesophageal cancers (n=210)



Post-operative staging for gastric cancers (n=153)



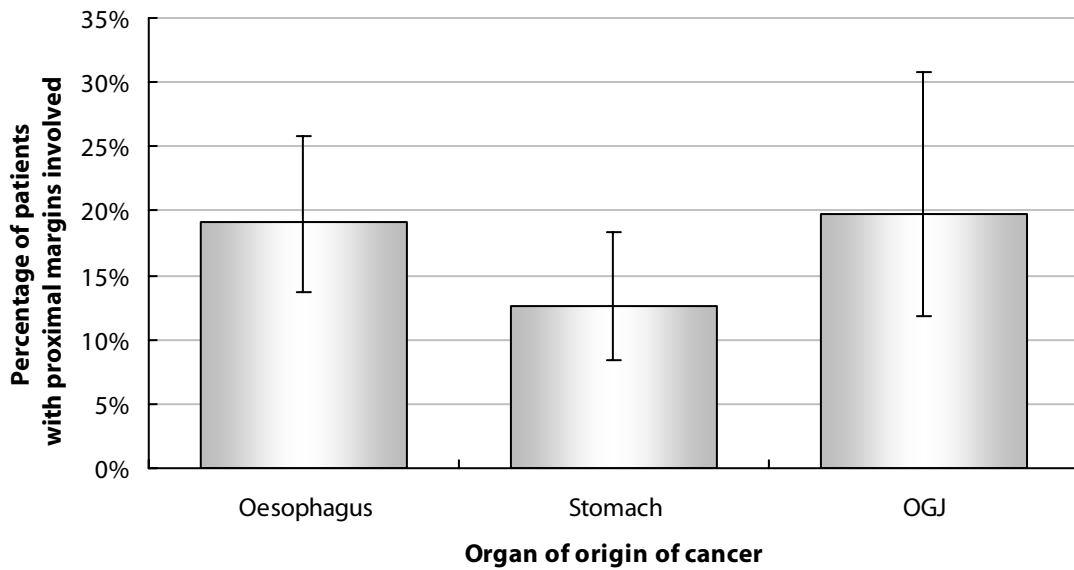
Margin involvement

Proximal margins and organ of origin of cancer

		Organ of origin of cancer				
		Oesophagus	Stomach	OGJ	Unspecified	All
Proximal margin involved	No	144	166	61	1	372
	Yes	34	24	15	0	73
	Unspecified	63	67	35	2	167
	All	241	257	111	3	612

Pathology

Proximal margin involvement and organ of origin of cancer (n=444)

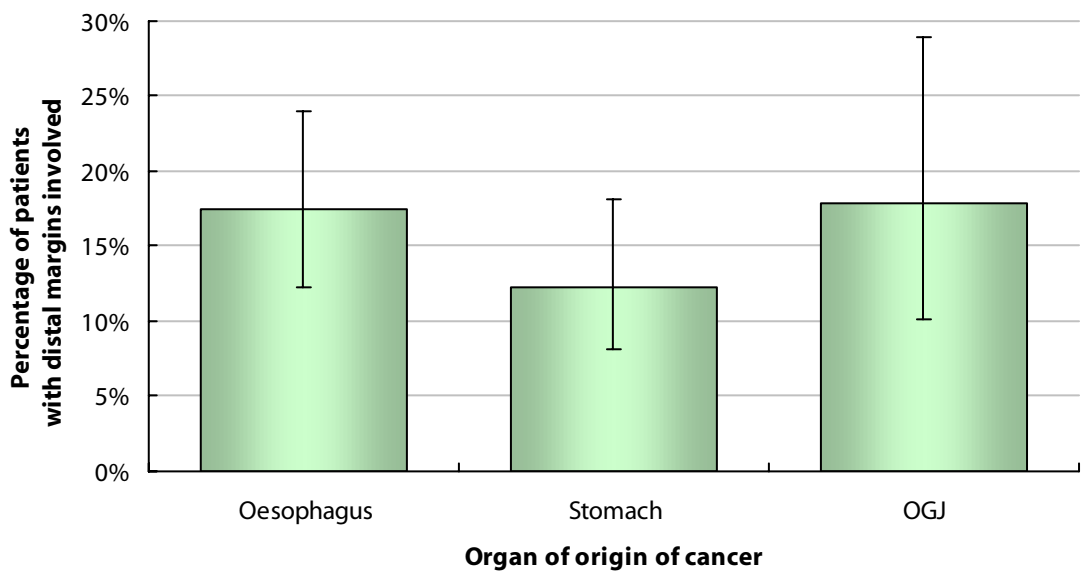


Distal margins and organ of origin of cancer

Pathology

		Organ of origin of cancer				
		Oesophagus	Stomach	OGJ	Unspecified	All
Distal margin involved	No	147	164	60	1	372
	Yes	31	23	13	0	67
	Unspecified	63	70	38	2	173
	All	241	257	111	3	612

Distal margin involvement and organ of origin of cancer (n=438)



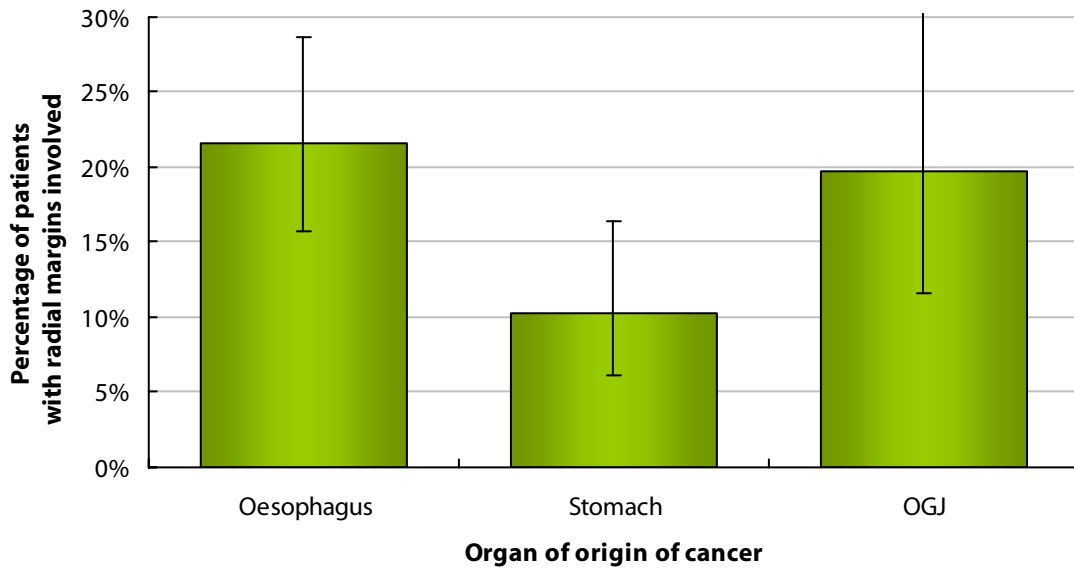
Longitudinal margin positivity is one outcome variable that Surgeons have considerable influence over. A positive proximal or distal margin is disastrous for the patient and usually results in tumour recurrence. Failure to resect enough intestine above or below the primary tumour or the wrong choice of operation must be the explanation for the unexpectedly high rate in this audit and is one of its main findings.

Radial margins and organ of origin of cancer

		Organ of origin of cancer				
		Oesophagus	Stomach	OGJ	Unspecified	All
Radial margin involved	No	131	140	57	1	329
	Yes	36	16	14	0	66
	Unspecified	74	101	40	2	217
	All	241	257	111	3	612

Pathology

Radial margin involvement and organ of origin of cancer (n=394)



AUGIS Audit Report 2004

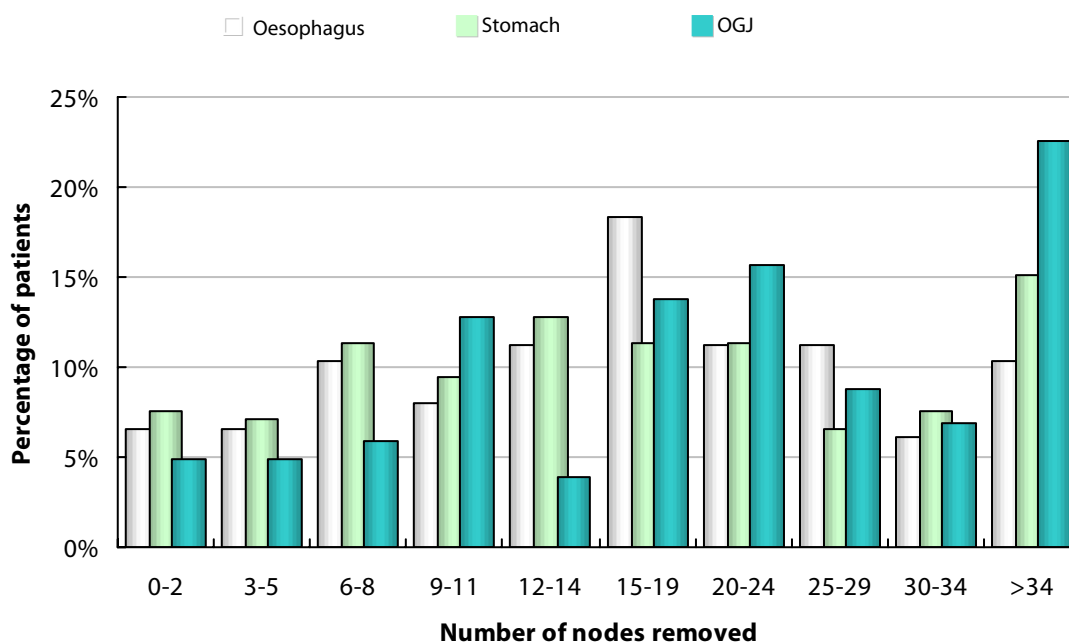
Nodes

Nodes removed

Pathology

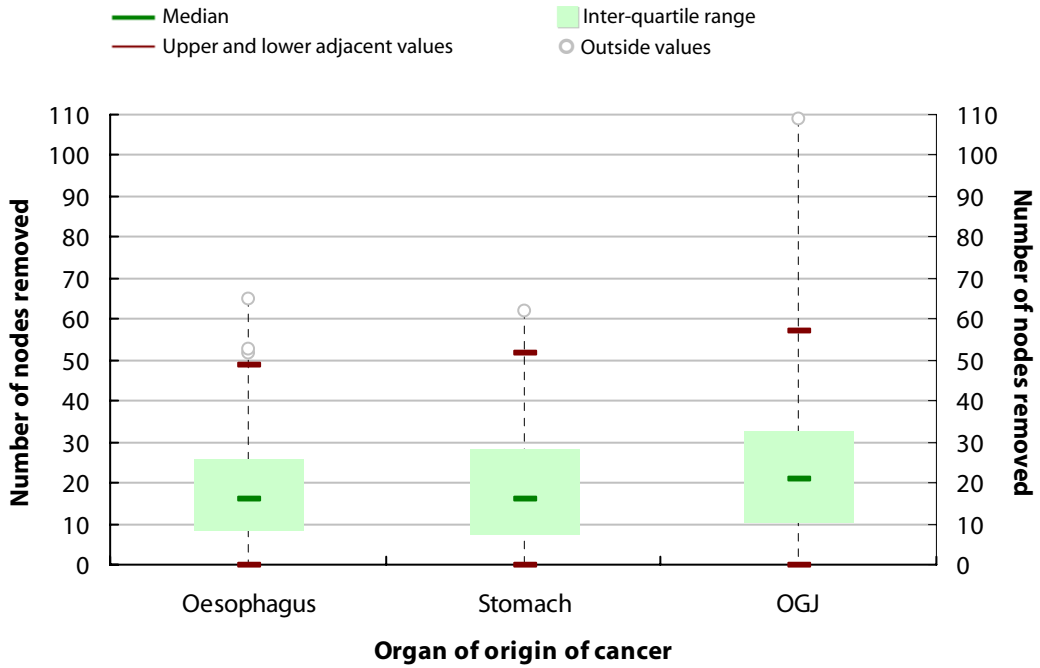
		Organ of origin of cancer				
		Oesophagus	Stomach	OGJ	Unspecified	All
Nodes removed	0-2	14	16	5	1	36
	3-5	14	15	5	0	34
	6-8	22	24	6	0	52
	9-11	17	20	13	1	51
	12-14	24	27	4	0	55
	15-19	39	24	14	0	77
	20-24	24	24	16	0	64
	25-29	24	14	9	0	47
	30-34	13	16	7	0	36
	>34	22	32	23	0	77
	Unspecified	28	45	9	1	83
	All	241	257	111	3	612

Number of nodes removed and organ of origin of cancer (n=527)

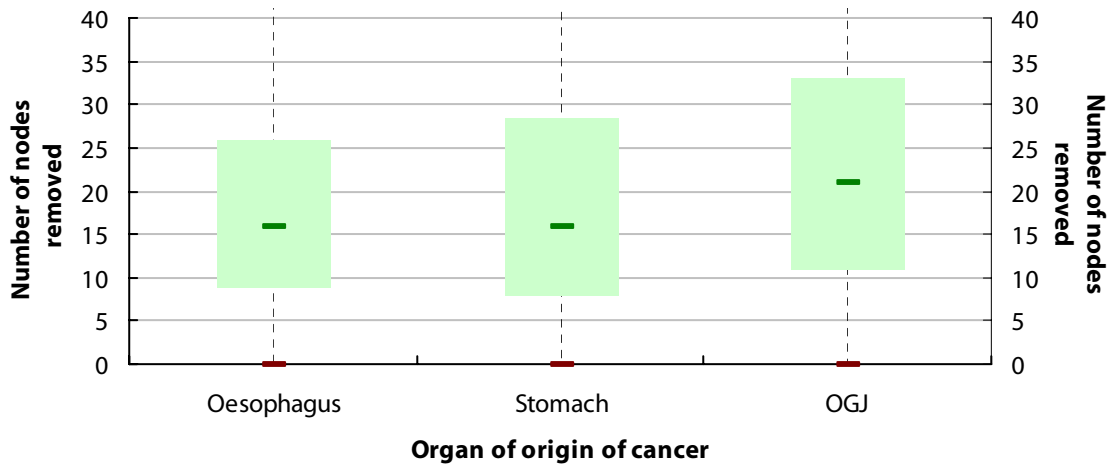


AUGIS Audit Report 2004

Number of nodes removed and organ of origin of cancer (n=527)

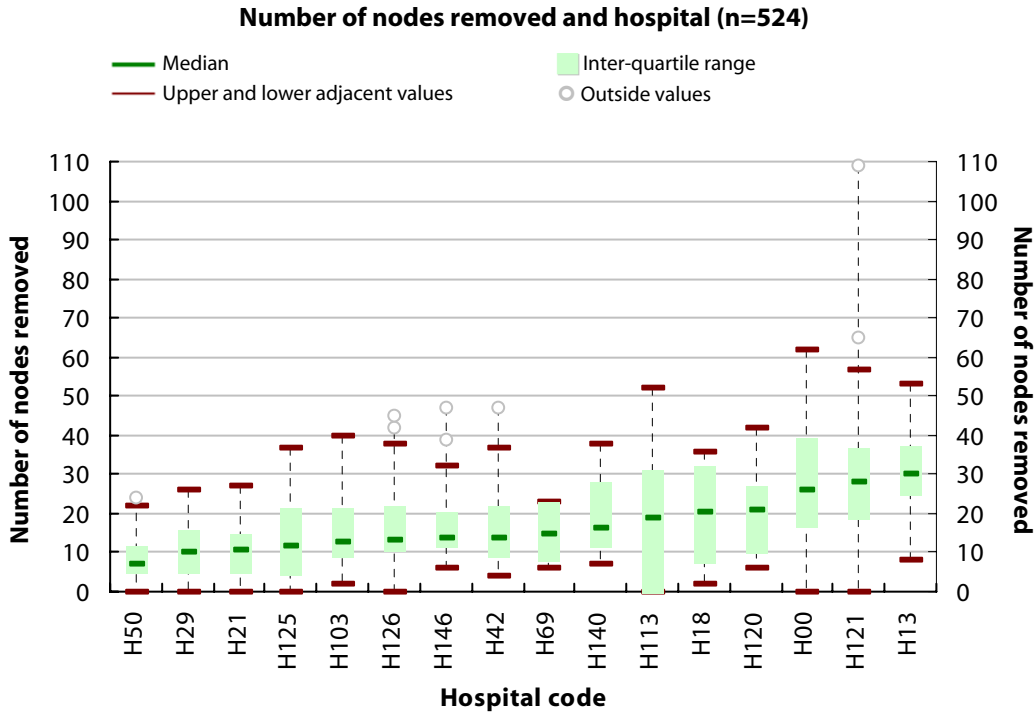


Focussing in on the inter-quartile range

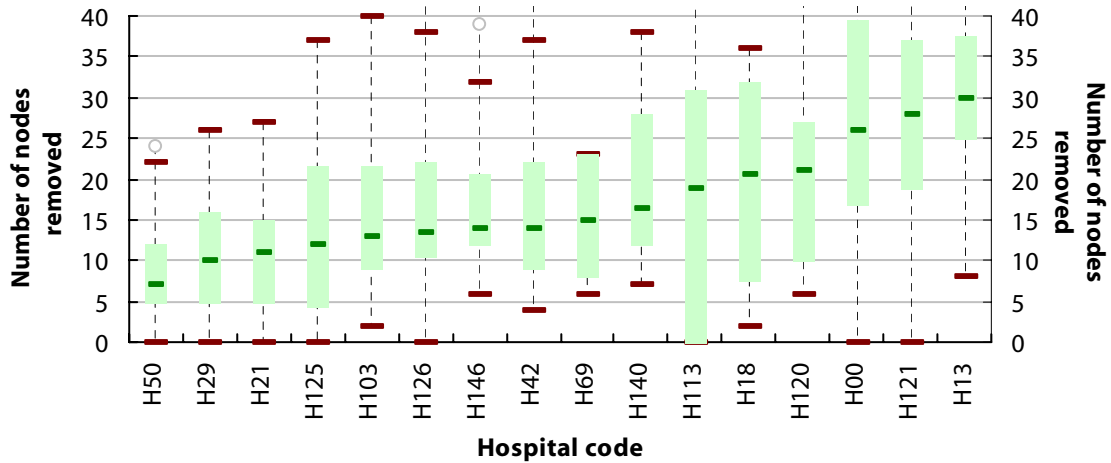


AUGIS Audit Report 2004

Pathology



Focussing in on the inter-quartile range



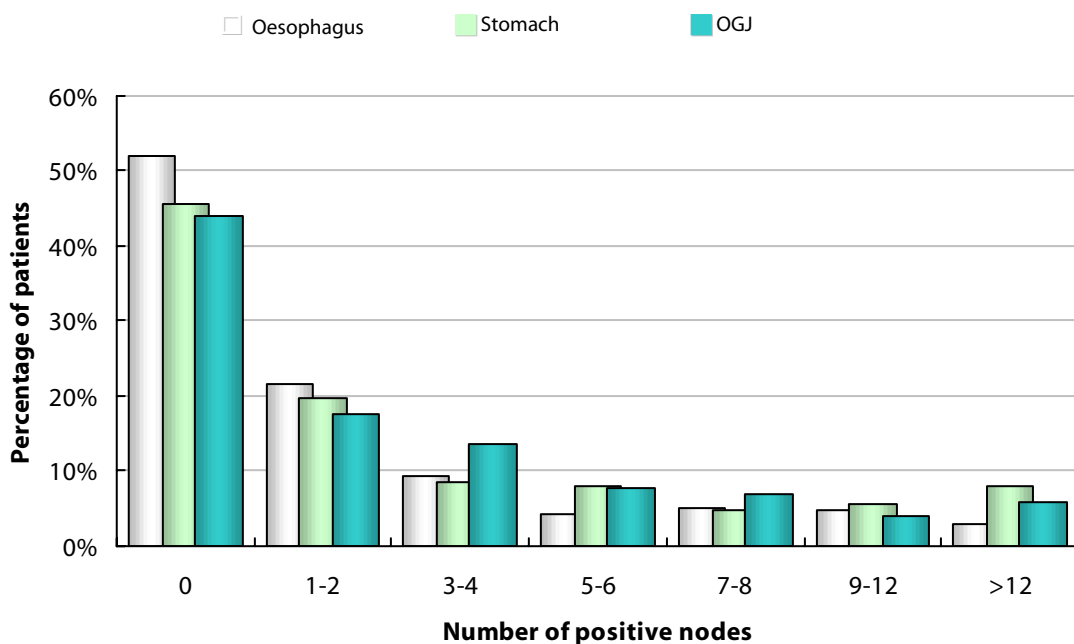
The number of nodes resected is important when TNM staging for Gastric cancer depends upon the number of involved nodes and a minimum of 15 nodes examined. This does not, of course, apply to oesophageal tumours although it seems likely that if only 5-6 nodes are examined from a junctional cancer there is a risk that some will be understaged. Many of the contributing Hospitals exceed 15 nodes resected for both gastric and oesophageal tumours, but some have median numbers well below this figure.

Positive nodes

		Organ of origin of cancer					All
		Oesophagus	Stomach	OGJ	Unspecified		
Positive nodes	0	110	97	45	2	254	
	1-2	46	42	18	0	106	
	3-4	20	18	14	0	52	
	5-6	9	17	8	0	34	
	7-8	11	10	7	0	28	
	9-12	10	12	4	0	26	
	>12	6	17	6	0	29	
	Unspecified	29	44	9	1	83	
	All	241	257	111	3	612	

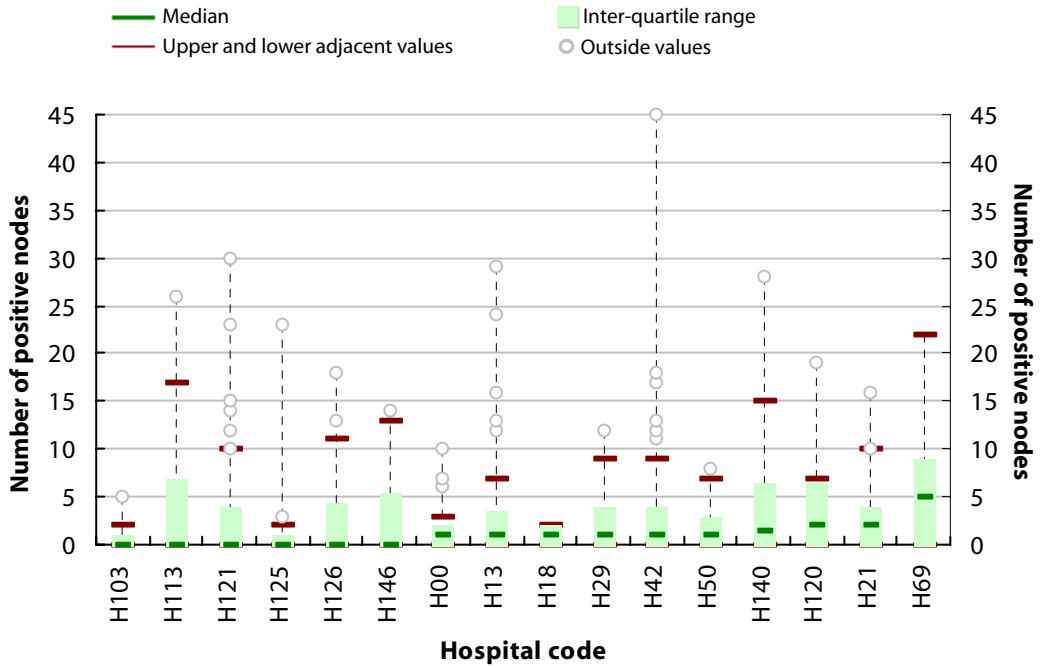
Pathology

Number of positive nodes and organ of origin of cancer (n=527)

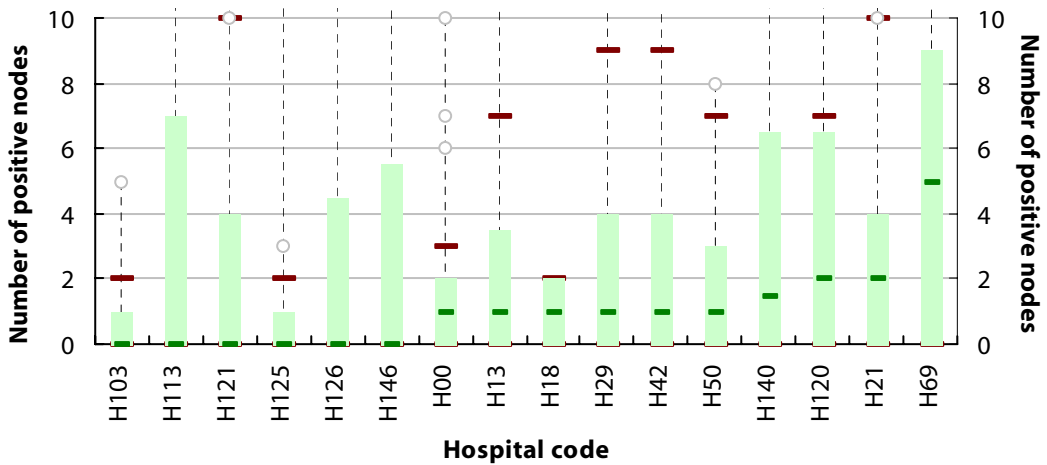


AUGIS Audit Report 2004

Number of positive nodes and hospital (n=525)

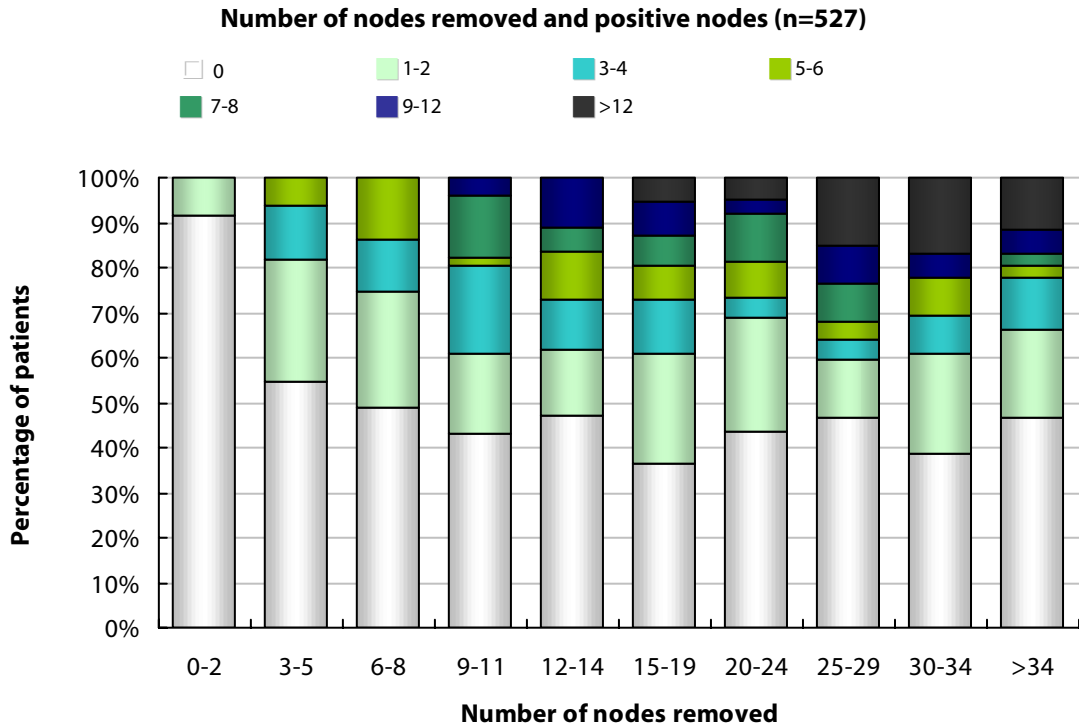


Focussing in on the inter-quartile range



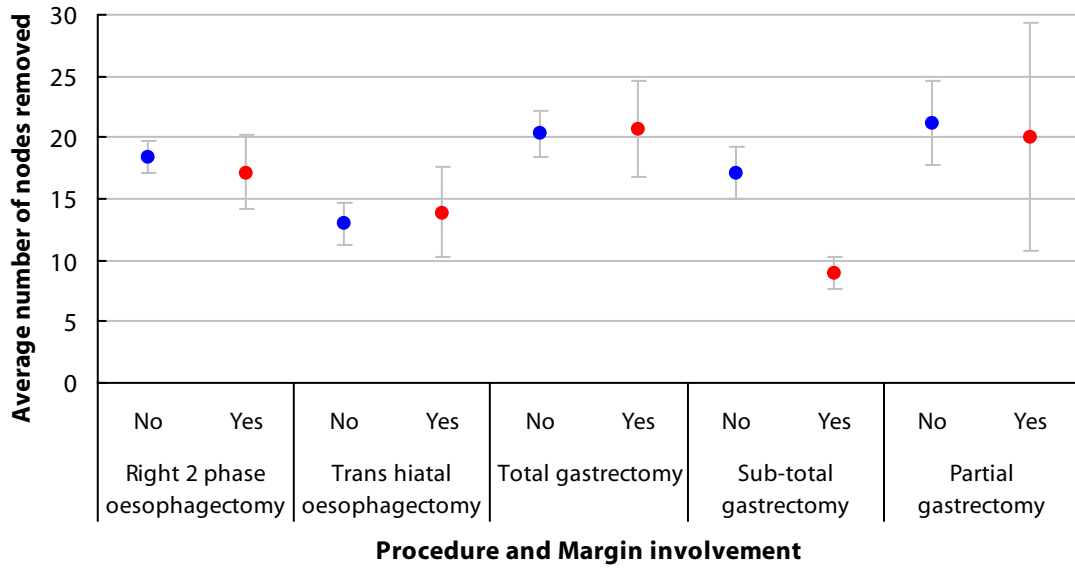
Nodes removed and positive nodes

Pathology



Operation, margin involvement and nodes removed

Average number of nodes, procedure and margin involvement (n=264)



Pathology

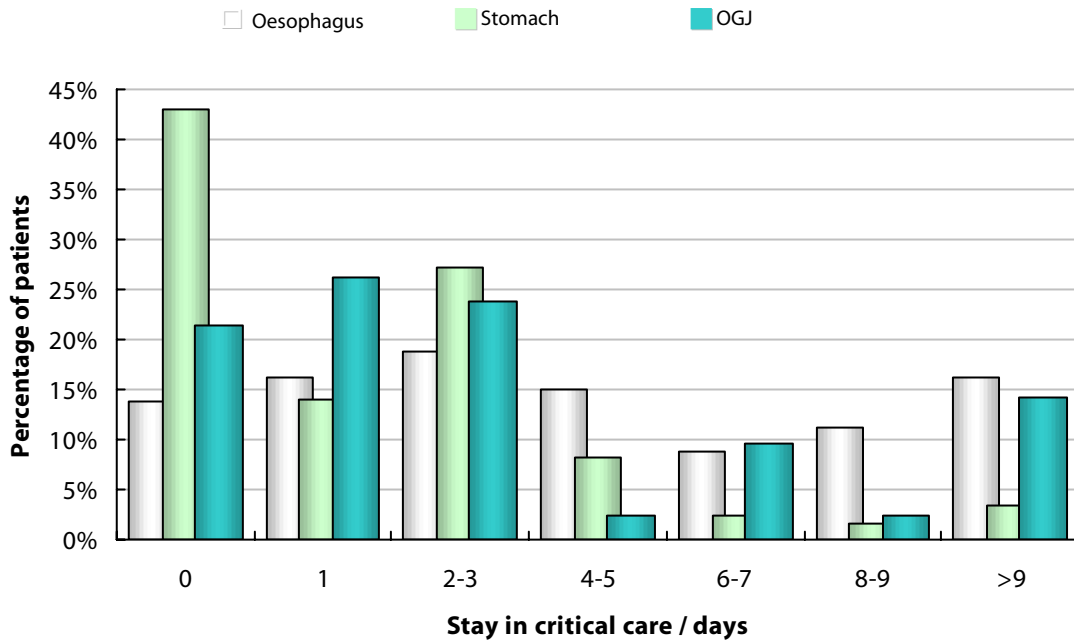
Outcomes

Stay in critical care

Outcomes

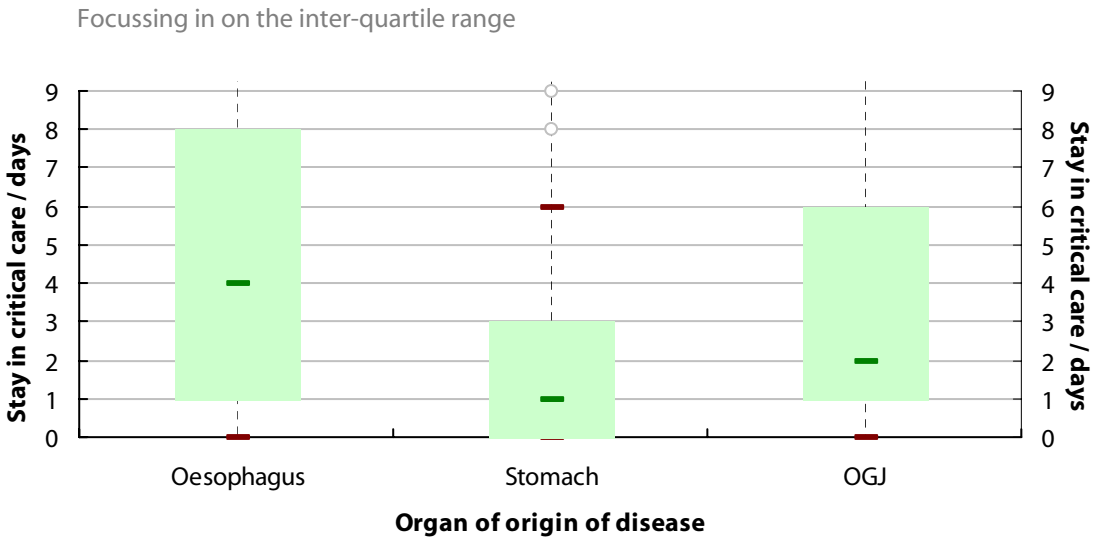
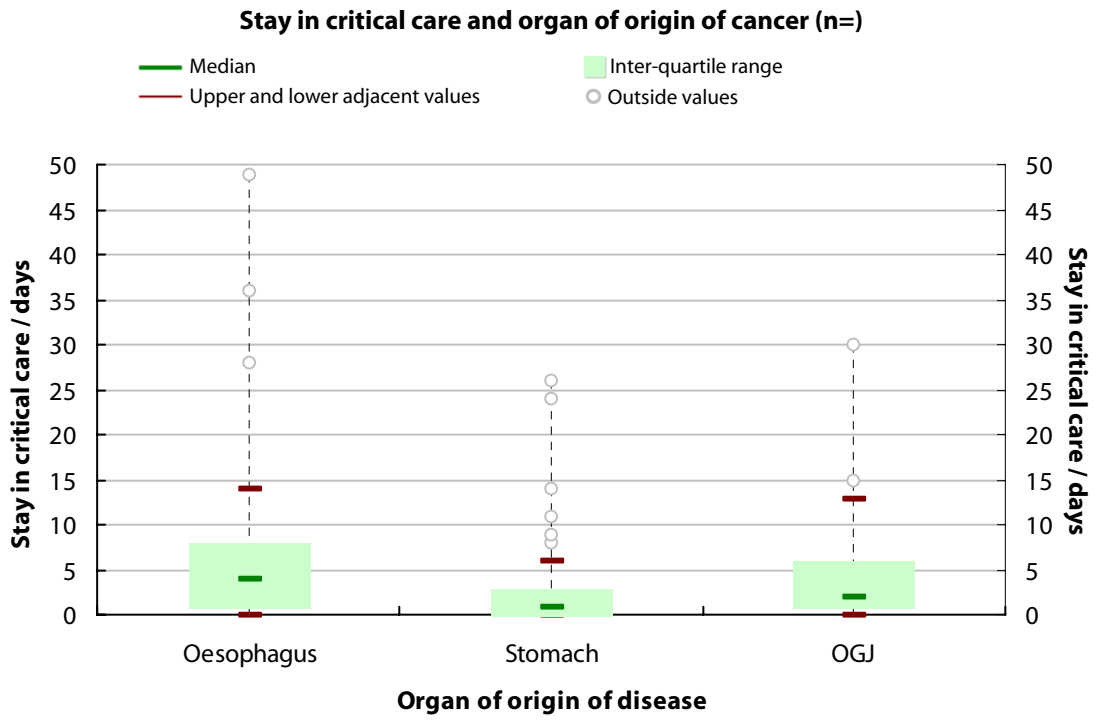
		Organ of origin of cancer				
		Oesophagus	Stomach	OGJ	Unspecified	All
Stay in critical care / days	0	11	52	9	1	73
	1	13	17	11	1	42
	2-3	15	33	10	0	58
	4-5	12	10	1	0	23
	6-7	7	3	4	0	14
	8-9	9	2	1	0	12
	>9	13	4	6	0	23
	Unspecified	161	136	69	1	367
	All	241	257	111	3	612

Stay in critical care and organ of origin of cancer (n=243)



AUGIS Audit Report 2004

Outcomes



AUGIS Audit Report 2004

Complications

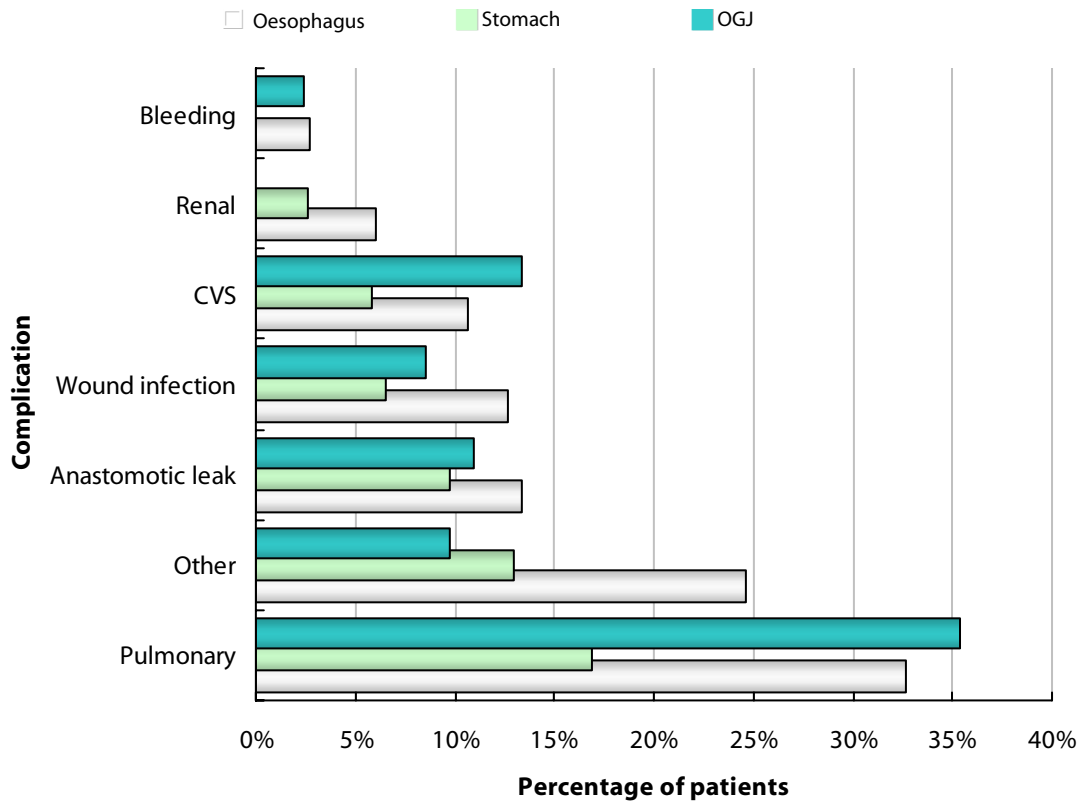
Complications and organ of origin of cancer

Outcomes

		Organ of origin of cancer				All
		Oesophagus	Stomach	OGJ	Unspecified	
Complications	None	45	81	31	1	158
	Anastomotic leak	20	15	9	0	44
	Cyclothorax	4	1	5	0	10
	Bleeding	4	0	2	0	6
	Wound infection	19	10	7	0	36
	CVS	16	9	11	0	36
	Pulmonary	49	26	29	0	104
	Hepatic	0	3	0	0	3
	Renal	9	4	0	0	13
	CNS	1	1	3	0	5
	DVT	1	0	1	0	2
	Peritonitis	1	1	0	0	2
	Pancreatic fistula	1	1	0	0	2
	Ileus	0	2	0	0	2
	Abscess	3	2	1	0	6
	Dehiscence	1	0	0	0	1
	Multi-organ failure	0	1	0	0	1
	Other	37	20	8	1	66
	Unspecified	91	103	29	1	224
	Patient denominator	241	257	111	3	612

AUGIS Audit Report 2004

The most frequently occurring complications and organ of origin of cancer (n=386)



Outcomes

As expected, many patients suffered respiratory complications after their surgery. Anastomotic leakage occurred in approximately 10%, being slightly more common when surgery was for a junctional cancer. This is a similar rate as found in the previous AUGIS audit.

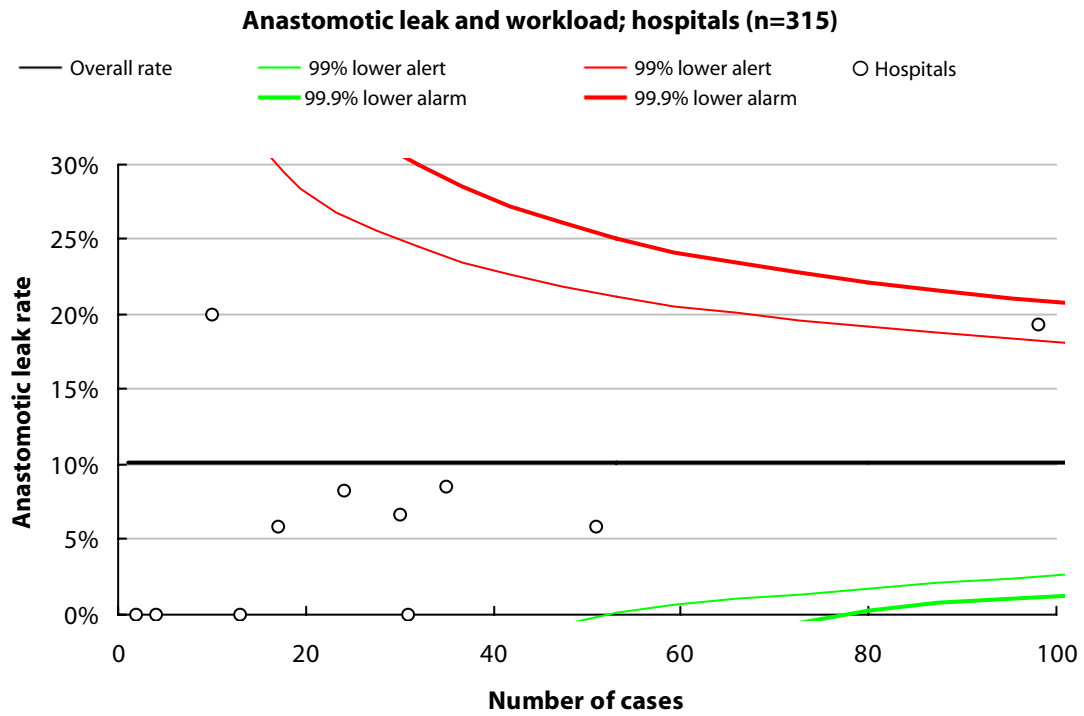
AUGIS Audit Report 2004

Complications and hospital

Outcomes

		Complication									Patient denominator
		None	GIT	Cylothorax	Wound infection	CVS	Pulmonary	Renal	Other	Unspecified	
Hospital	H00	17	0	1	3	3	6	0	5	0	31
	H13	0	2	2	4	1	9	1	6	29	48
	H18	2	0	0	0	0	2	1	0	1	5
	H21	18	2	1	1	0	3	0	5	3	33
	H29	23	3	0	1	3	11	1	6	0	35
	H42	0	7	0	3	1	4	0	5	72	91
	H50	0	0	0	0	0	0	0	0	45	45
	H69	11	0	0	0	0	2	0	0	0	13
	H103	0	0	0	1	0	1	0	0	13	14
	H113	0	3	0	0	0	4	0	7	26	39
	H116	7	2	0	0	0	1	1	1	0	10
	H120	0	0	0	0	0	1	0	1	9	11
	H121	39	19	0	17	11	22	8	19	4	102
	H125	11	2	3	0	4	8	0	1	1	25
	H126	18	3	3	3	9	15	0	17	0	51
	H127	1	0	0	0	0	0	0	1	1	3
	H140	11	1	0	0	1	3	0	3	6	23
	H146	0	0	0	3	2	8	0	10	10	25
H168	0	0	0	0	1	4	1	2	4	8	
Total	158	44	10	36	36	104	13	89	224	612	

AUGIS Audit Report 2004



Outcomes

Only one Hospital seems to lie outside the confidence intervals for the group with regards to anastomotic leakage. It is clearly a busy unit, but a leak rate of nearly 20% is unusually high

AUGIS Audit Report 2004

In-hospital mortality

In-hospital mortality and organ of origin of cancer

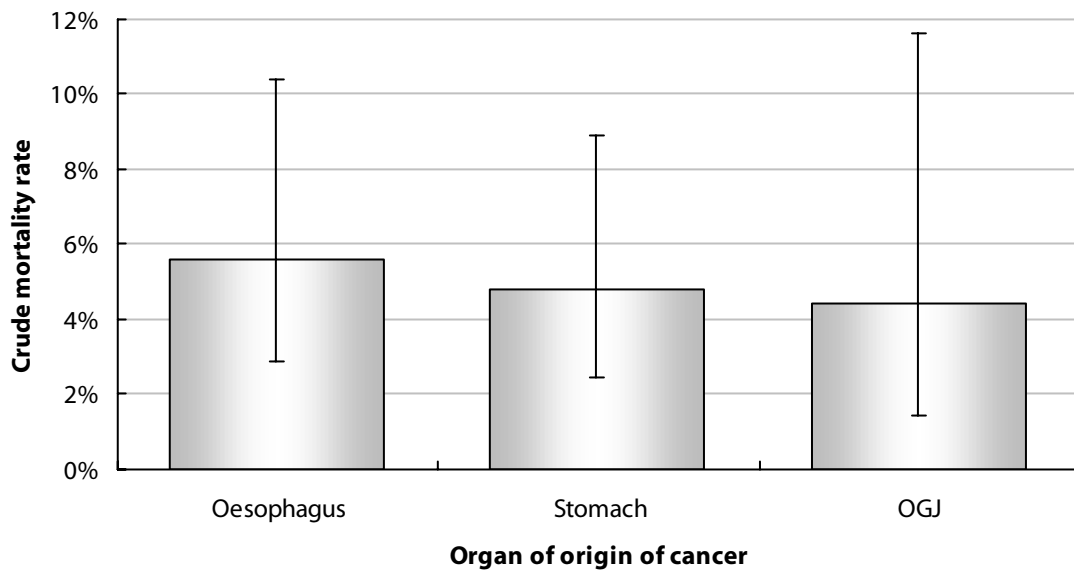
Rate are: Oesophagus 5.6% (n=178; 95% CI: 2.9-10.4%), Stomach 4.8% (n=209; 95% CI: 2.4-8.9%) and OGJ 4.4% (n=90; 95% CI: 1.4-11.6%)

Overall 5.0% (n=479; 95% CI: 3.3-7.5%)

Outcomes

		In-hospital mortality			
		No	Yes	Unspecified	All
Organ of origin of cancer	Oesophagus	168	10	63	241
	Stomach	199	10	48	257
	OGJ	86	4	21	111
	Unspecified	2	0	1	3
	All	455	24	133	612

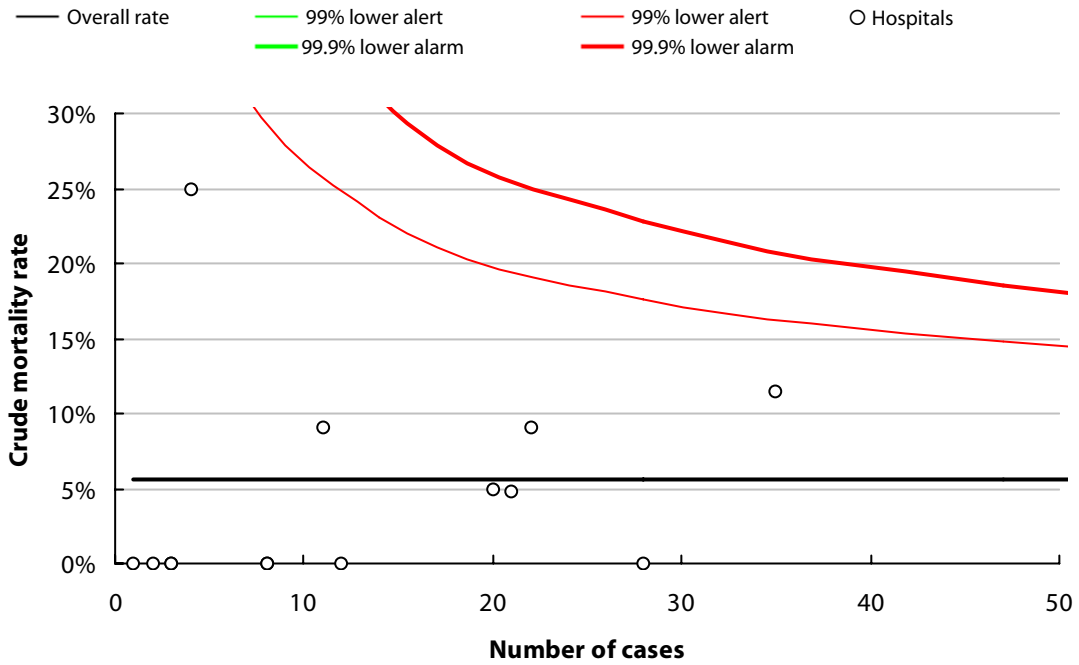
In-hospital mortality rate and organ of origin of cancer (n=477)



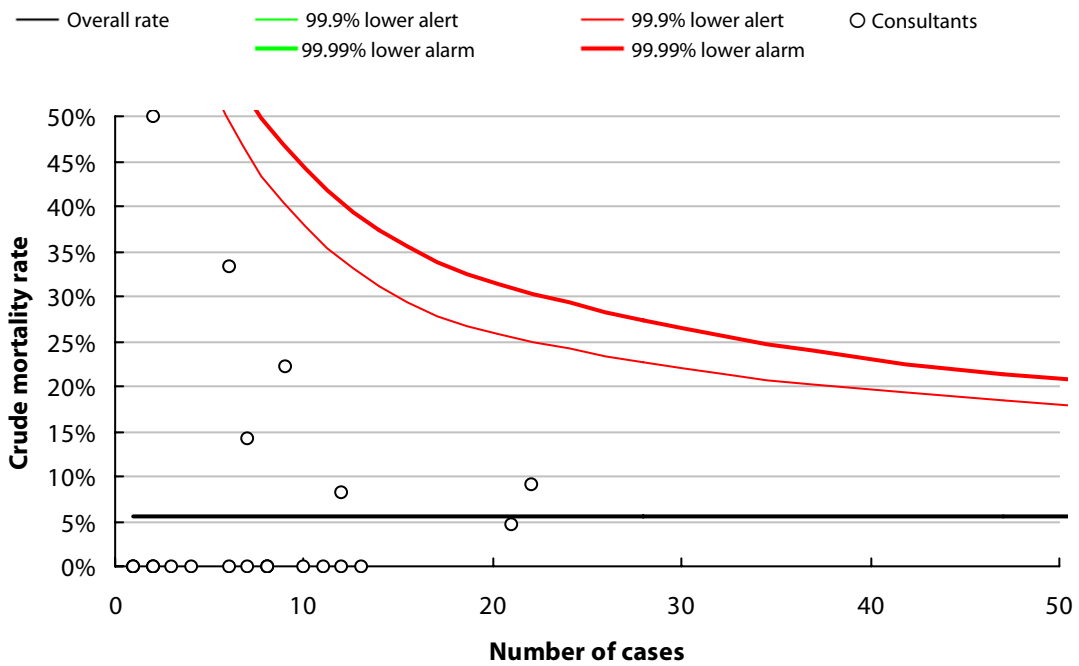
In-hospital mortality and volume

Outcomes

Oesophageal cancers: In-hospital mortality and workload; hospitals (n=178)



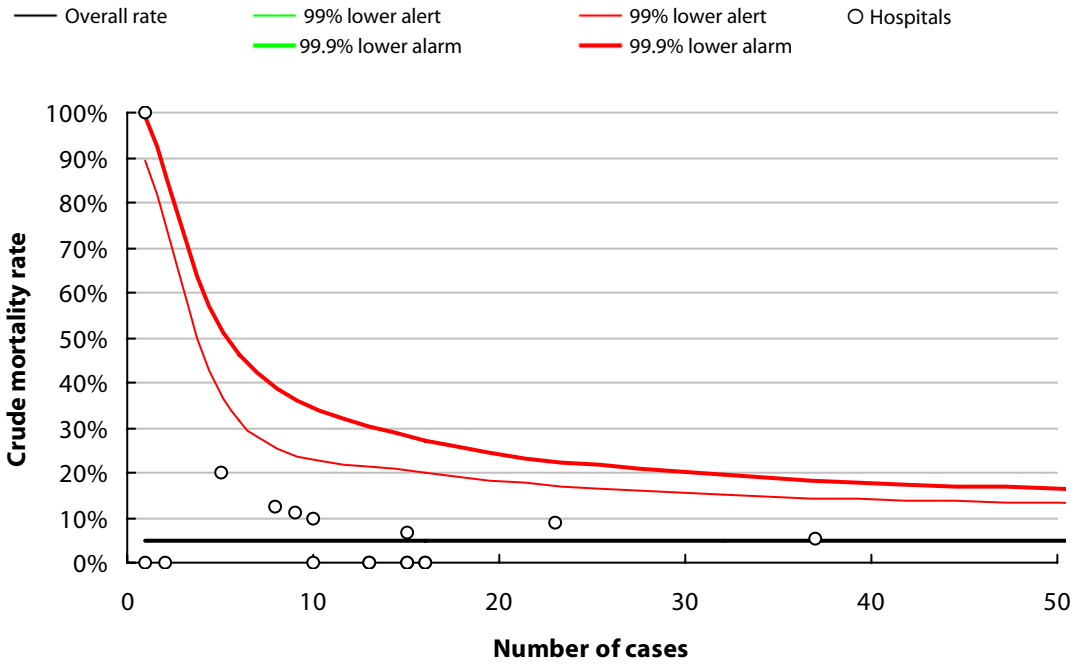
Oesophageal cancers: In-hospital mortality and workload; consultants (n=178)



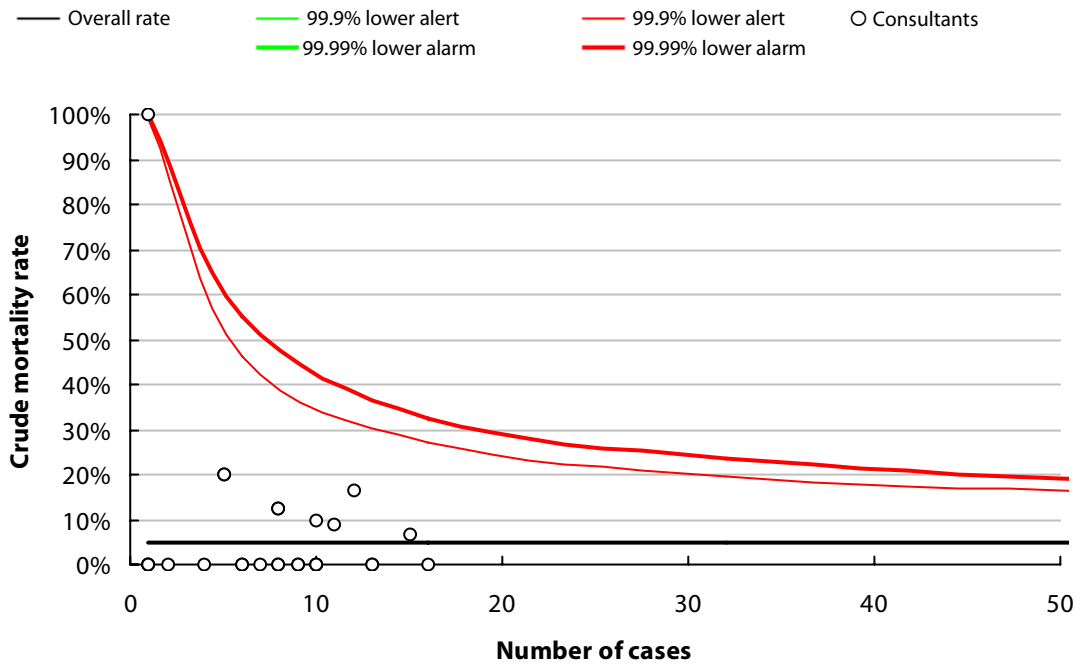
AUGIS Audit Report 2004

Outcomes

Gastric cancers: In-hospital mortality and workload; hospitals (n=209)

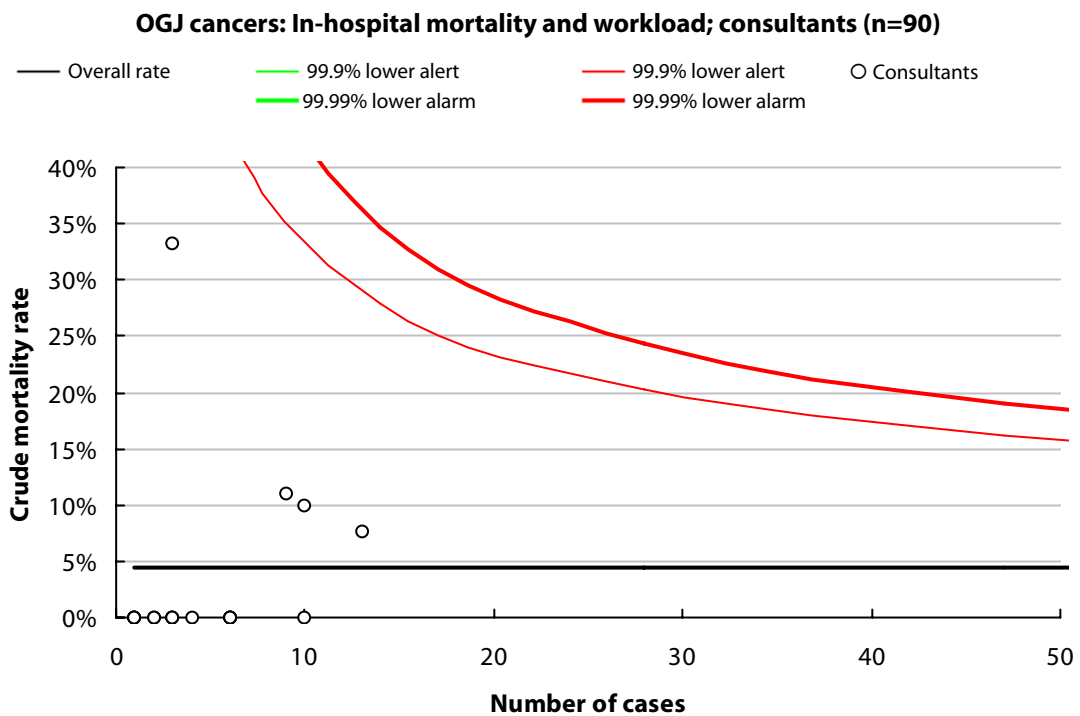
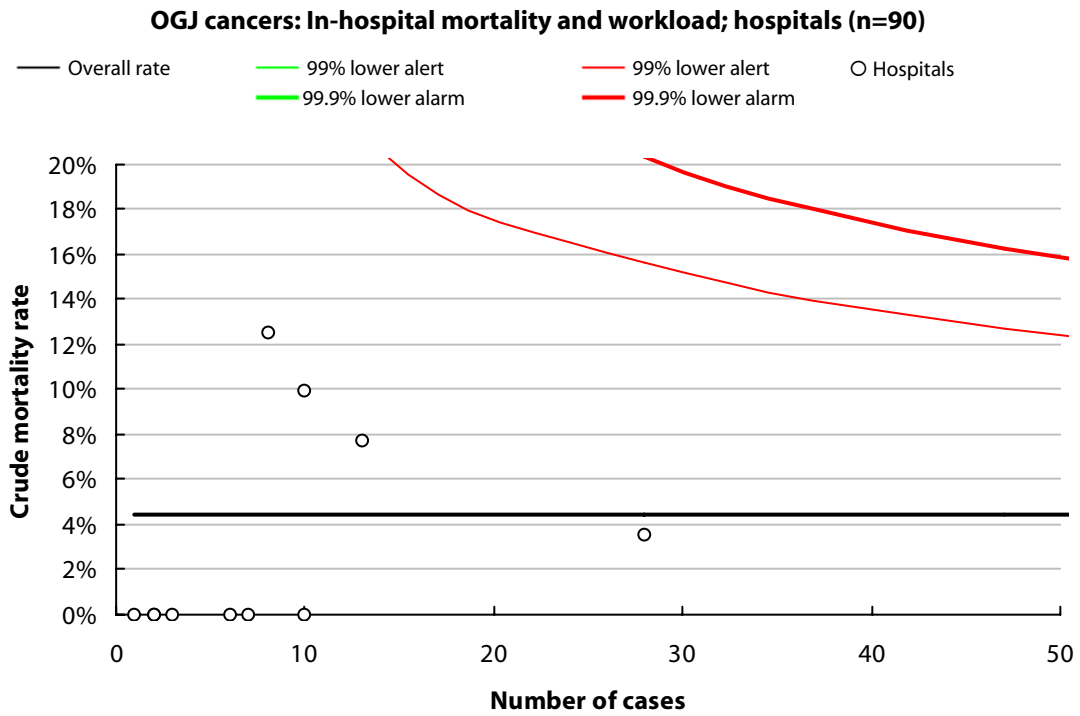


Gastric cancers: In-hospital mortality and workload; consultants (n=209)



AUGIS Audit Report 2004

Outcomes



Data returns for mortality were better than some items but still about a fifth of returns did not say whether the patient had survived surgery or not. These are crude mortality rates, un-adjusted for case mix and cover only a one-year period, all of which are weaknesses. They show an overall mortality rate of approximately 5% which compares favourably with the first AUGIS report which had an overall mortality rate of 8.9%. All Hospitals fall well within the confidence intervals.

AUGIS Audit Report 2004

In-hospital mortality and operation

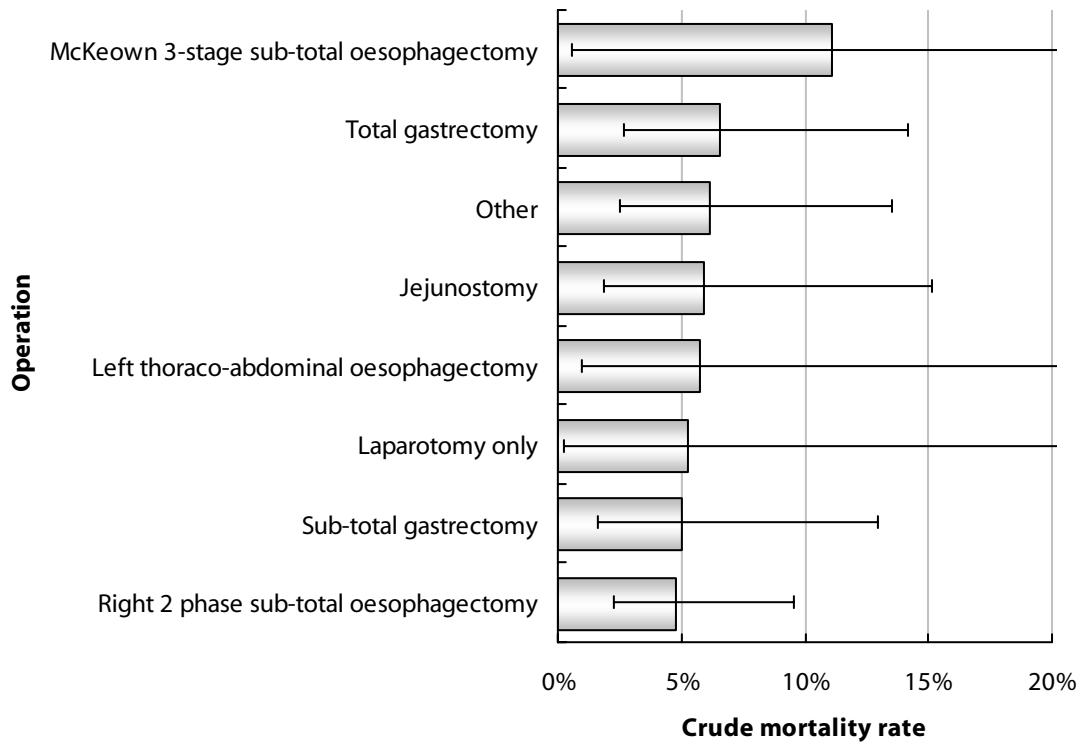
Outcomes

		In-hospital mortality			
		No	Yes	Unspecified	All
Operation	Total gastrectomy	86	6	21	113
	Sub-total gastrectomy	76	4	4	84
	Completion gastrectomy	4	0	0	4
	Extended total gastrectomy	9	0	0	9
	Partial gastrectomy	21	0	17	38
	Right 2 phase sub-total oesophagectomy	159	8	25	192
	Left thoraco-abdominal oesophagectomy	33	2	11	46
	McKeown 3-stage sub-total oesophagectomy	8	1	2	11
	Trans-hiatal oesophagectomy	21	0	37	58
	Laparotomy only	18	1	4	23
	Laparotomy and thoracotomy	1		0	1
	Jejunostomy	64	4	0	68
	Wedge / localised resection	6	0	0	6
	Oesophagectomy unspecified	0	0	9	9
	Other	91	6	6	103
	Unspecified	1	0	2	3
Patient denominator	455	24	133	612	

All the different procedures seem to have similar mortality rates except the three-phase McKeown oesophagectomy, which appears to have a higher mortality. However, small numbers of these were done and the confidence intervals are wide, making it unlikely to be a significant finding. Transhiatal oesophagectomy and Extended total gastrectomy resulted in no deaths, but again the small numbers make any meaningful conclusions impossible.

AUGIS Audit Report 2004

In-hospital mortality rate and operation



Outcomes

Operations not plotted have 0% mortality.

AUGIS Audit Report 2004

30-day mortality

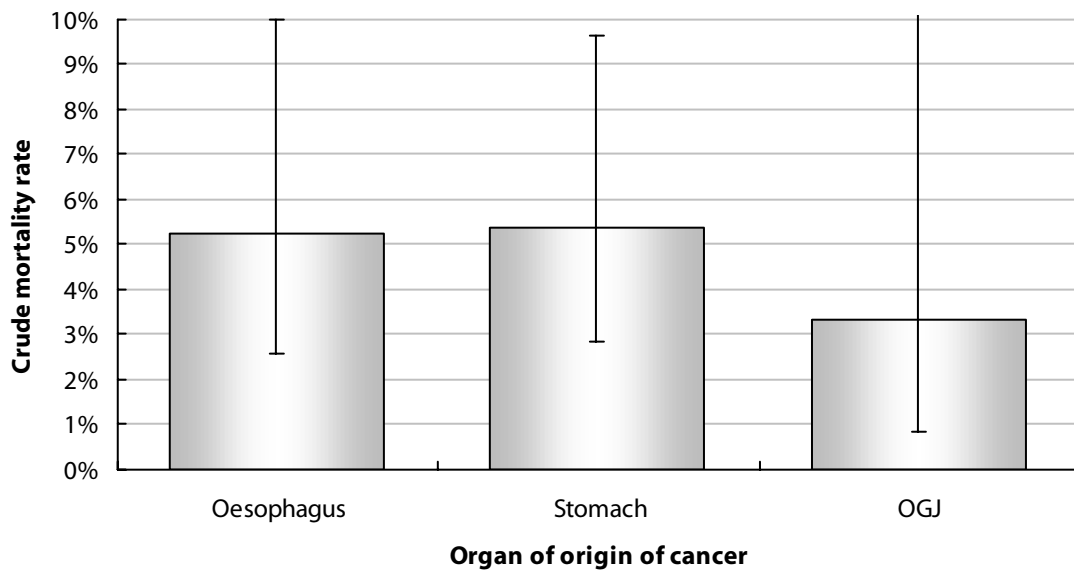
30-day mortality and organ of origin of cancer

Rate are: Oesophagus 5.2% (n=172; 95%CI: 2.6-10.0%), Stomach 5.4% (n=205; 95%CI: 2.8-9.7%) and OGJ 3.3% (n=90; 95%CI: 0.9-10.1%)

Outcomes

		30-day mortality			
		No	Yes	Unspecified	All
Organ of origin of cancer	Oesophagus	163	9	69	241
	Stomach	194	11	52	257
	OGJ	87	3	21	111
	Unspecified	2	0	1	3
	All	446	23	143	612

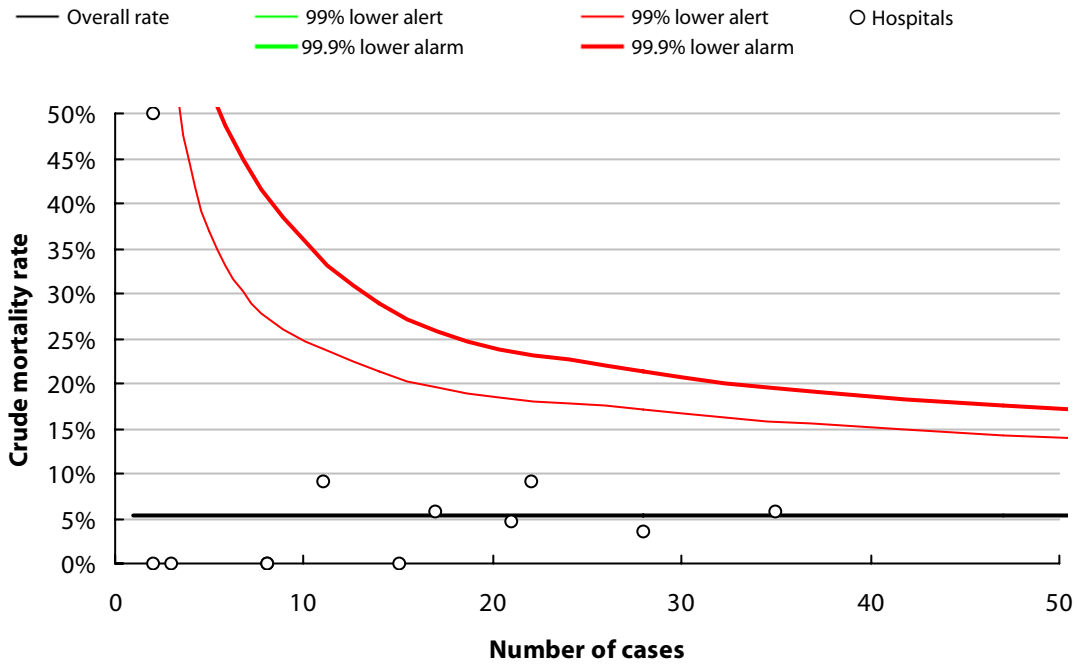
30-day mortality rate and organ of origin of cancer (n=467)



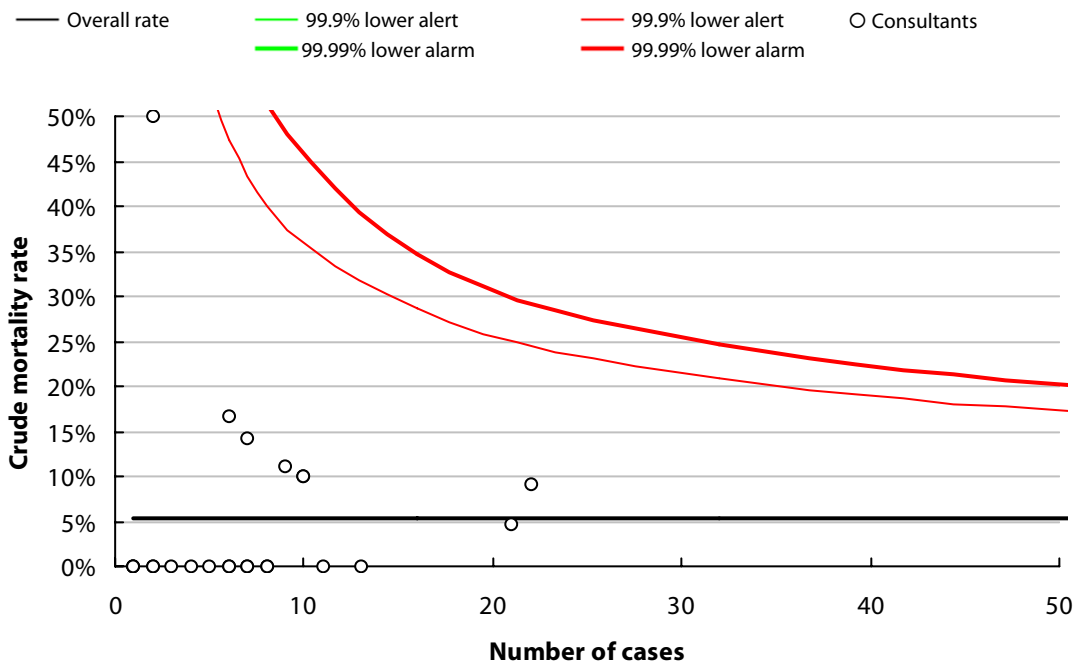
30-day mortality and volume

Outcomes

Oesophageal cancers: 30-day mortality and workload; hospitals (n=172)



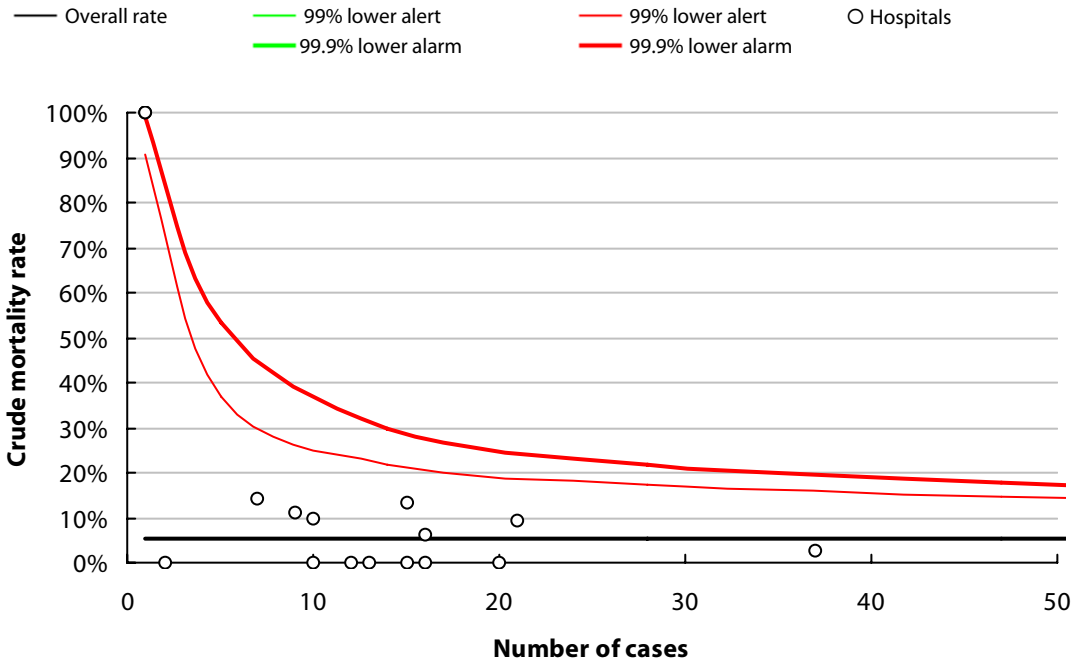
Oesophageal cancers: 30-day mortality and workload; consultants (n=172)



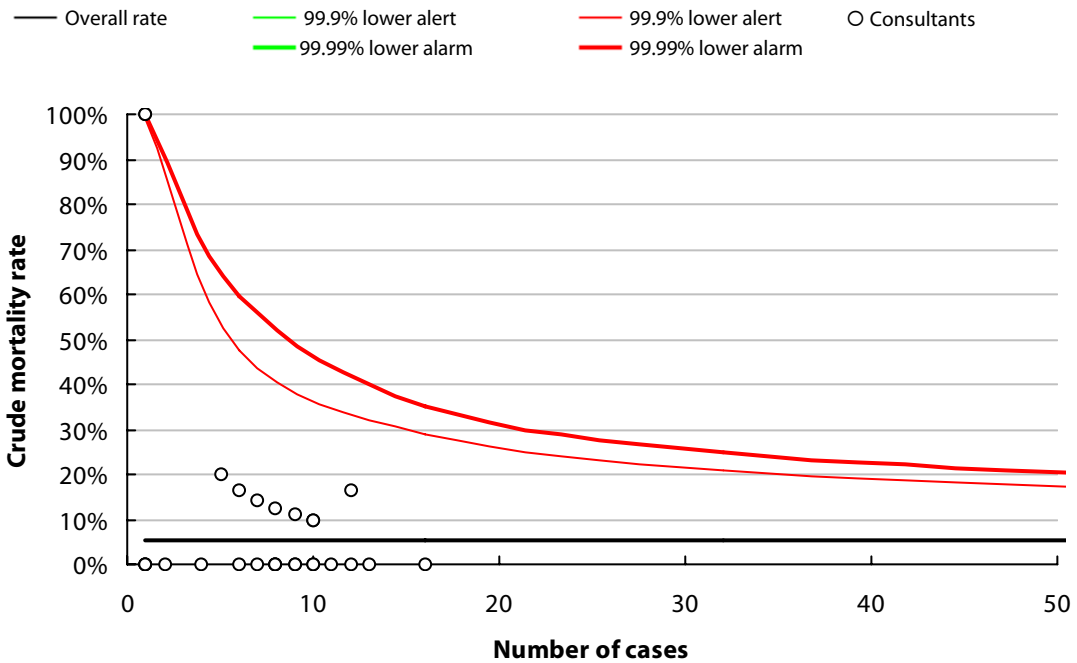
AUGIS Audit Report 2004

Outcomes

Gastric cancers: 30-day mortality and workload; hospitals (n=205)



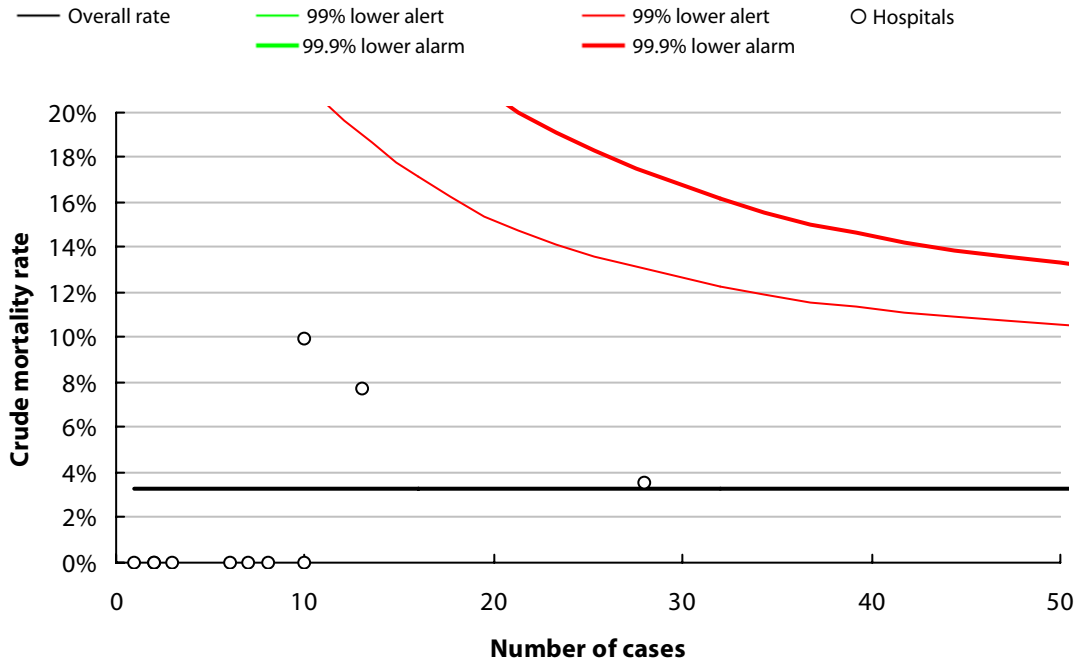
Gastric cancers: 30-day mortality and workload; consultants (n=205)



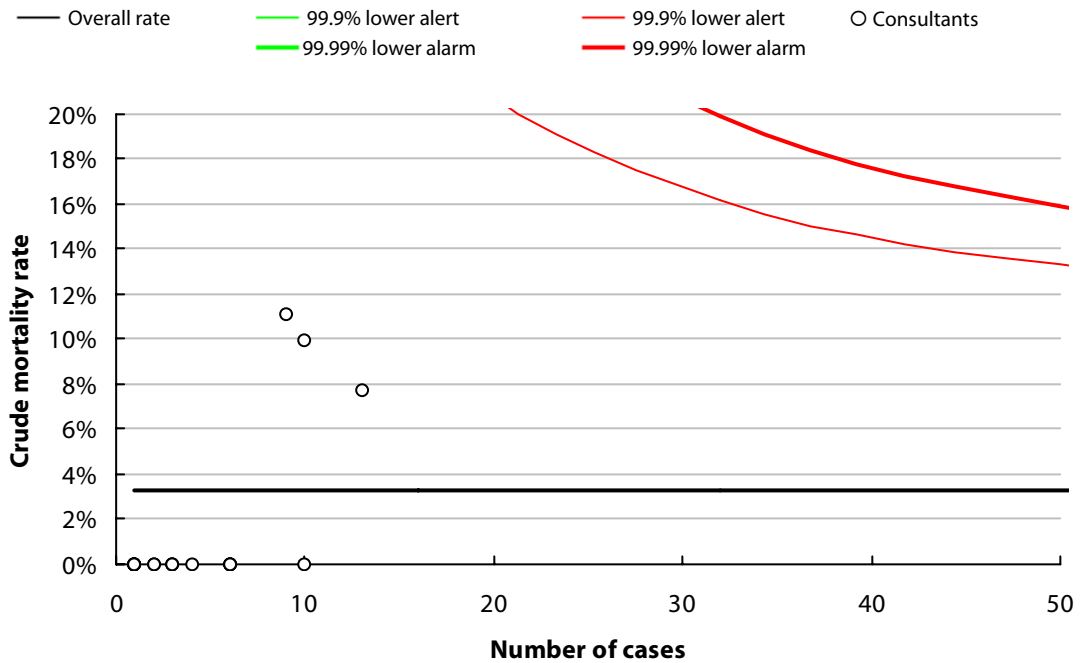
AUGIS Audit Report 2004

Outcomes

OGJ cancers: 30-day mortality and workload; hospitals (n=90)



OGJ cancers: 30-day mortality and workload; consultants (n=90)



Summary

Summary

In 2001, HES data for England & Wales show that 1,713 oesophagectomies were performed with a crude 90-day mortality rate of 12% (DOH HES data). This is probably a truer reflection of the overall risk of a patient dying after an oesophagectomy than the 6% reported by the self-selected group who have created this audit report. However, year-on-year, a Hospitals' post-operative mortality rate for this group of patients is likely to fluctuate somewhere between 5-10%. Very large numbers of patients are needed to produce meaningful statistical analyses. HES data can be used for this but cannot be adjusted easily for case mix. Having said that, we too have been unable to adjust because of incomplete data and we therefore need to think carefully before we plan further audit studies.

In addition, our focus on postoperative mortality rates may not be appropriate. One-year survival has been proposed as a more valuable outcome indicator for these patients; a patient dying from recurrent disease within 12 months of surgery has probably gained little from it and would have been better off being palliated some other way. Quality of life studies are particularly important in this area and AUGIS may wish to help develop meaningful assessments, which can be used to direct management decisions in the future.

Unfortunately, a relatively small proportion of patients presenting with symptomatic Oesophago-gastric tumours will be cured by current treatments. Our hope is that more tumours will be detected at an asymptomatic stage through Endoscopic Surveillance or the development of novel markers for disease. Early tumours are often cured by surgery alone whereas advanced tumours require multi-modal therapy. It is becoming clear that improvements in staging technologies detect more patients with metastatic disease who do not benefit from surgery and the percentage of patients having surgery falls.

Surgeons should undoubtedly focus on the things which they can influence most. Logically these are:

- Selecting the right patients for surgery (Staging & Fitness)
- Preparing these patients well (Optimisation)
- Communicating well with patients, relatives, nurses & colleagues etc.
- Working closely with other specialties (MDT)
- Technical competence (low complication rates, high R0 resection rates)
- Giving patients the best quality of life possible
- Following-up patients carefully and palliating recurrence if it occurs

This audit report enables those who contributed to it to examine some of these issues and see the strengths and weaknesses of their current practice. For audit to have any value beyond curiosity, the cycle of change and re-audit must occur. How AUGIS, the Healthcare Commission, The Cancer Networks and individual Surgeons are going to monitor outcomes after Oesophago-gastric cancer surgery in the future is still unclear. What we do know, however, is that obtaining accurate information about outcomes in the Health Service is still difficult despite massive increases in overall funding. This is a challenge the NHS must respond to if it is to show value for money.