

# **S**cottish **A**udit of **S**urgical **M**ortality

Annual Report

2001 data

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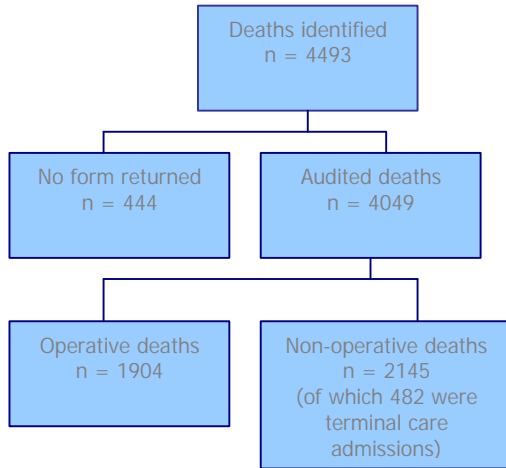
# Executive Summary

## Introduction

This report summarises the SASM data for patients dying under surgical care during 2001.

## Summary

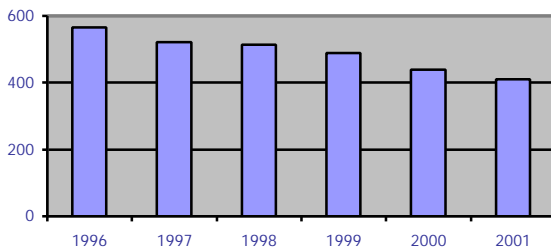
4493 deaths in surgical departments throughout Scotland were recorded in 2001.



Since 1996 there has been a slight but steady increase in the median age of all post-operative deaths from 74 years to 76 years reflecting changes in the healthcare requirements of an increasingly older, frail population.

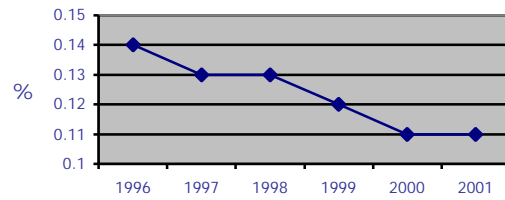
The number of deaths following elective surgical admissions shows a continuing and significant decline since 1996 (28% reduction).

Deaths reported to SASM which followed elective admissions



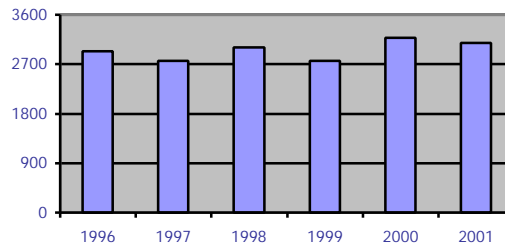
This represents 0.11% of 2001 elective surgical admissions (0.14% in 1996).

% of elective surgical admissions who died under surgical care in Scotland, by year



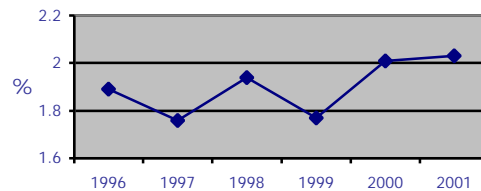
The vast majority of deaths under surgical care follow emergency admission, however, and the numbers of these show no real change over the same time period.

Deaths reported to SASM which followed emergency admissions



In 2001 this represented 2% of patients admitted with a surgical emergency.

% of emergency surgical admissions in Scotland who died, by year



## Care Pathway

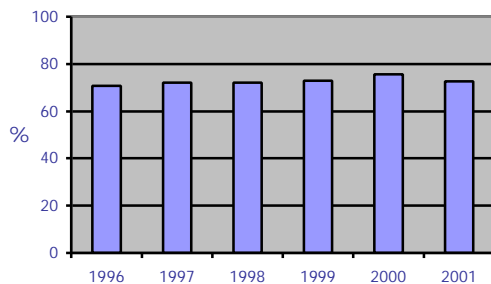
### (a) Operatives cases

Surgical vascular diseases constitute the largest group which results in post-operative death. This is followed by colorectal diseases and then orthopaedic causes. Fractured neck of femur, however, remains the commonest single condition leading to death following surgery, perhaps because in many cases the fracture is an indicator of increasing frailty and is often associated with multiple complex problems. A detailed study of these cases is conducted through a separate NHS funded audit (SHFA).

Fractured neck of femur is one of the NHS Scotland Quality indicators for the care of the elderly in the acute setting.

Where death followed surgery, the decision to operate was taken by the consultant surgeon in charge in over 97% of cases, an increase since 1996 (94%). The number of operations taking place with the consultant surgeon at the operating table (either operating or assisting) fell slightly in 2001 (from 76% to 73%), however this varies across Scotland.

**Consultant surgeons present at operation**



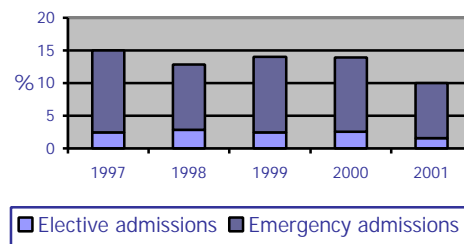
The number of cases where the seniority of the surgeon was criticised fell dramatically in 2000 and this improvement has continued into 2001 (60 in 1999, 29 in 2000 and 28 cases in 2001).

The number of operations where the anaesthetic consultant was present has risen from 62% in 1996 to 73% in 2001. Again there is some variation across Scotland. The seniority of anaesthetist was criticised by assessors in only 11 cases.

85% of patients who died post-operatively had significant severe ongoing medical conditions (56% cardiovascular; 33% respiratory; 15% neurological/psychiatric and 16% renal), in addition to the cause for surgical admission, which contributed to their death.

From 1997 to 2001 there has been a gradual reduction in the percentage of cases where the assessors felt that the quality of pre-operative care could have been improved.

**Assessors stated that the journey of care up to the point of operation could have been improved**

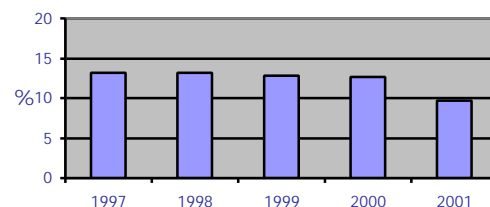


There continues to be a reduction in the number of cases that were operated on during the night (14% in 2000; 9% in 2001).

46% of patients had a definable post-operative complication, but 80% of these were medical rather than surgical and 97% of these were recognised promptly. Failure to use HDU or ITU (either by omission or non availability) shows a *significant decrease* over previous years (65 cases in 2001; 113 cases in 2000).

Post-operative care also showed an improvement from previous years with a reduction in the percentage of cases in which the assessors believed that post-operative care could have been improved.

**Assessors stated post-operative care could have been improved**



**(b) Non-operative cases**

Of the total number of patients who died under the care of a surgeon, less than half (47%) actually underwent surgery. Excluding patients with cancer who were admitted for terminal care, 16% of non-operative cases were never felt fit for surgery due to an irreversible rapid decline in their medical condition.

The decision not to operate was made by a consultant in 94% of cases (92% in 2000). The number of cases where a surgical assessor considered that an operation should have been performed

was 23 (19 in 2000). This represents no real change from previous years.

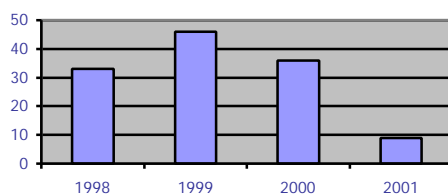
It is of concern to note that 35% of these "non-operative" patients who died in a surgical ward did so of a condition that was not thought to be surgical. Assessors thought that they may have been more appropriately admitted by or transferred to the care of another specialist.

### (c) All deaths

In 9% of cases the participating surgeon or anaesthetist acknowledged shortfalls in the quality of care their patients received, but believed that these had not affected the outcome. This represents a welcome level of self-criticism and insight which SASM would applaud.

Some aspect of the patient's care was thought to have contributed to the clinical outcome in 7% of patients who died, with most comments made about pre- and post-operative care. These should be regarded as areas of concern where the overall care of the individual was not optimal. Where an area of concern was deemed to have caused death, this was confirmed to be the situation on only 9 occasions following final review (0.22% of audited deaths) – a significant reduction over the figure in 2000 (36).

**Number of cases where 'causes of concern' caused death**



### Audit Process

90% of SASM forms returned were completed by the consultant surgeon responsible for the case.

One particular area of concern for SASM is that, of the deaths reported, there has been a continuing decrease in the compliance of doctors in the number of forms returned to, and therefore of deaths audited by, SASM.

The SASM Board set a rising minimum target for the percentage of cases returned by each consultant (85% in 2001

and 80% in previous years). The number of consultants failing to meet this target has risen. It was 29 in 1999, 51 in 2000 and 82 in 2001. This represents 10% of all cases not being subject to the review process.

This year's audit of surgical deaths shows the quality of care is continuing to improve with fewer cases where there were areas of concern identified. Patients, anaesthetists, surgeons, and management are aware that there are still areas of practice that can be improved. The increasingly elderly and frail population reviewed through this study should serve as a reminder of the changing demographics of the Scottish population and the inevitable stresses this places on surgical and anaesthetic services.

### Chairman's comments

I am pleased to present the SASM report for 2001. The public should take confidence from the fact that surgical deaths within Scotland are subjected to the scrutiny of other specialists working in the same field. This process is designed to identify issues that need to be brought to the attention of consultants responsible for these patients and the Trusts where the care took place. SASM endeavours (when appropriate) also to reassure the clinicians that care has been optimal despite the negative outcome and not to simply identify fault and blame. It also seeks to provide constructive comment to enable improvement in care for the future, when occasionally that care has not been of the highest standard.

Over the past 18 months SASM has undergone a large number of reforms and has undertaken a wide consultation with the participants by letter and an open meeting. The participating surgeons and anaesthetists highlighted many issues. Amongst the many constructive suggestions that will be included in further changes within SASM is placing the involved clinician's response to the assessors' opinions as the final part of the feedback process. The evolution of SASM will continue and must involve and gain the participants' approval. Ownership will only serve to strengthen the Audit.

SASM receives the continuing support of the vast majority of surgical and anaesthetic consultants in Scotland. SASM is developing its full potential with significant additional funding from the Scottish Executive and with the support of the Minister of Health and the Chief Medical Officer. The SASM audit process is now robust enough to allow the data generated concerning hospital deaths under surgical care to be used in the consultant annual review. The data collected during 2003 will be available to be used as a voluntary part of the appraisal process in 2004. On a personal level one would have to wonder why a clinician would be unwilling to present their SASM annual review as part of an annual appraisal. This omission must raise questions from Trust Medical Directors.

A legal opinion of the status of SASM has been sought and is reproduced on the website. This provides a framework within which SASM must function. It also clarifies the Audit's position in a number of issues related to duty of care.

This report contains much good news; a continuing reduction in elective deaths, improvements in pre- and post-operative care; action on HDU beds has been reflected in a significant fall in the incidence of cases where a failure of HDU provision is cited as having a role in a patient's death.

The data also show a very high consultant involvement in patient care in Scotland. They also once again show a high level of senior supervision of those in training in Scotland.

There is still a significant incidence of issues of concern associated with a patient's death - 17% this year, although this is down from 20% in 2000. Only 7.6% of audited deaths revealed issues of concern thought to have contributed to or caused a patient's death. This compares with 10.1% and 9.9% for the years 2000 and 1999 respectively.

The SASM process is carried out by virtually every practising clinician within the audited specialties on behalf of their colleagues and for the benefit of patients

undergoing surgical care in Scotland. SASM has engendered a sense of ownership of the audit by those audited. This has been achieved because the audit process is performed by clinicians working in the same environment. It is hoped that, given the current reforms within SASM, all consultants will now feel able to participate fully.

I believe the single greatest achievement of SASM is that objective peer review of surgical deaths takes place in Scotland. This unique feat is all the more remarkable as participation in SASM is entirely voluntary. The high compliance rate is testament to the commitment of the surgical and anaesthetic clinicians involved to continuous audit of clinical practice. As chairman I would like to congratulate all concerned; not only those who run the audit, but more especially the participants.

**Key points:**

- *The public should be very reassured that surgical deaths are reviewed and that this process has enabled improvements in patient care in Scotland.*
- *The number of deaths following elective surgical admission continues to fall.*
- *Consultant surgeons and anaesthetists are directly involved in the care of 97% of surgical patients who subsequently die.*
- *There continues to be a gradual fall in the percentage of cases where the assessors felt that the quality of both pre- and post-operative care could have been improved.*
- *Deaths associated with failure to use HDU or ITU show a significant decrease over previous years.*
- *In 7% of patients who died, sub-optimal care was considered to have either contributed to or caused death. This is a reduction from previous years.*
- *The Scottish Audit of Surgical Mortality remains at the forefront of mortality audit almost entirely due to the voluntary, open and honest participation of the vast majority of surgeons and anaesthetists in Scotland.*

**What is SASM?**

The Scottish Audit of Surgical Mortality (SASM) is a unique, independent, confidential review of deaths under surgical care. All forms returned to SASM are assessed by consultant surgeons and, where appropriate, anaesthetists. The results of this process are then fed back to the clinicians and Trusts involved and thereby improve the quality of patient care.

These encompass issues which are specific to surgical and anaesthetic care or may relate to hospital or resource concerns. A complete review of the SASM process including management structure, documentation and assessment process has been completed to improve the quality and reliability of the reporting mechanism, assessment and the recording of the peer review outcome.

Quality control mechanisms are part of the audit process. This includes a second review of 10% of audit forms where no causes of concern have been identified and a formal case note review of any death caused by an 'area of concern'. The formal appeals process has been enhanced after consultation with SASM participants and the Central Legal Office and a right of reply to any peer review comment is guaranteed.

Specialty specific forms (orthopaedics, paediatric surgery and neurosurgery along with the standard surgical and anaesthetic forms) and questions reflecting current clinical concerns (hospital acquired infections, theatre availability and local mortality review) will be introduced in the 2003 audit data collection period.

All Independent hospitals have agreed to participate in the audit from 2003. It is also hoped to extend the scope of the audit to include thoracic surgery and we will collect data on deaths within 30 days of surgery - even after discharge from surgical care - in 2003.

A programme of education and standardisation of assessment is being introduced for all assessors. Most of these changes will be in place by 2003 and will allow data collected from that year onwards to be used as part of the consultant appraisal process. This data

will be available from the fourth quarter of 2004.

A comparison of SASM with the National Confidential Enquiry into Perioperative Deaths (NCEPOD) shows a number of key differences. These are - inclusion of all deaths under surgical care (SASM); post-operative deaths and an annual sample, plus future inclusion of medical deaths, near misses and interface with primary care (NCEPOD); feedback to consultants on each individual case plus a consultant annual review, and an annual Trust review plus future individual comparisons for voluntary use in consultant appraisals (SASM); mandatory compliance (NCEPOD).

### **SASM Board**

Chairman Professor John G Temple,  
President, Royal College of Surgeons of  
Edinburgh

#### **Constitution of the Board**

- President, Royal College of Surgeons of Edinburgh
- President, Royal College of Physicians & Surgeons of Glasgow
- President, Royal College of Physicians of Edinburgh
- Chairman of the Scottish Board of the Royal College of Anaesthetists
- Chairman of SASM Management Committee
- Surgical representative from the SASM Management Committee
- Anaesthetic representative from the SASM Management Committee
- Chairman of the SASM Advisory Group
- SASM National Coordinator
- NHS in Scotland representative
- Two lay members

### **SASM Management Committee**

Chairman Mr Peter A Stonebridge  
National Coordinator Mrs Helen D Burton

#### **Clinical Coordinators**

Mr C R Howie (Orthopaedic surgery)  
Dr H J McFarlane (Anaesthetics)  
Mr W R Murray (General surgery)  
Mr P A Stonebridge (Vascular surgery)  
Mr A M Thompson (General surgery)  
Dr E Wilson (Anaesthetics)  
Dr T J Winning (Anaesthetics)

### **Advisory Group**

Chairman – Mr David C Smith  
Vice Chairman – Dr Nigel P Leary  
+ 26 consultant representatives of Trusts  
and Specialty Groups

### **Contact details**

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Tel: 0141 227 3232

Fax: 0141 204 5830

Website: [www.show.scot.nhs.uk/sasm](http://www.show.scot.nhs.uk/sasm)

### All deaths (n = 4493)

Figure 1:

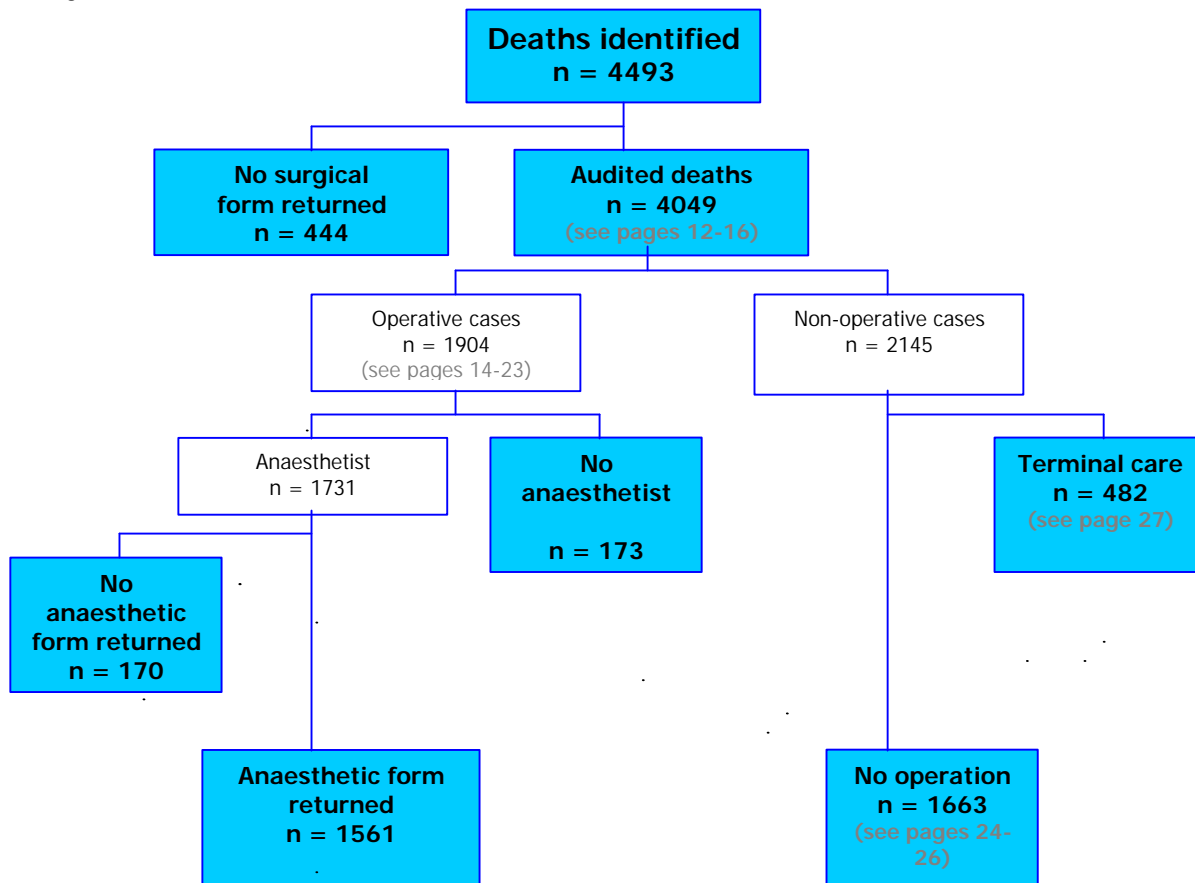
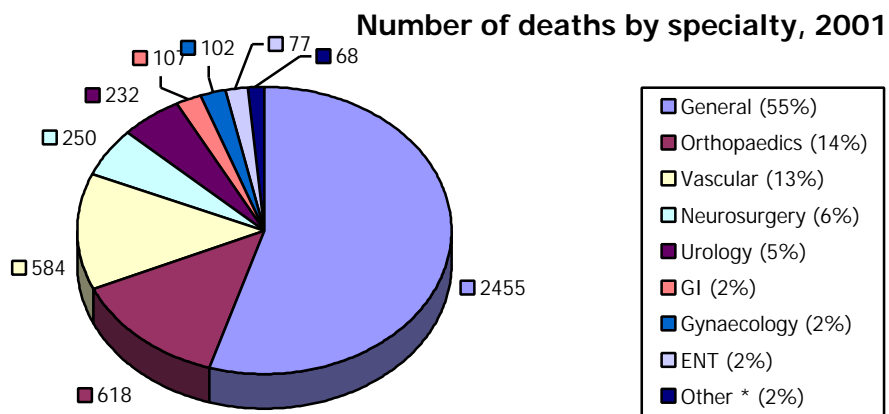


Figure 2:



\*Plastic 36, Maxillo-facial 19, Thoracic 5, Paediatrics 3, Ophthalmology 2, Other 2, Spinal 1

Figure 3: Total number of deaths reported to SASM, by year

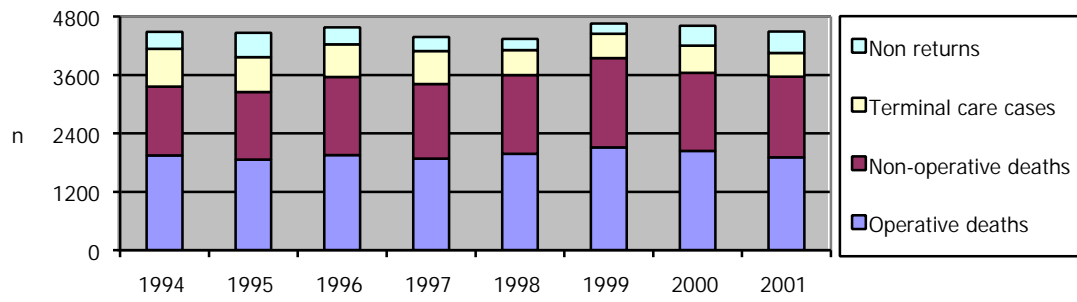


Figure 4:

Status of surgeon completing SASM form, 2001  
(excludes non-returns and terminal care cases)

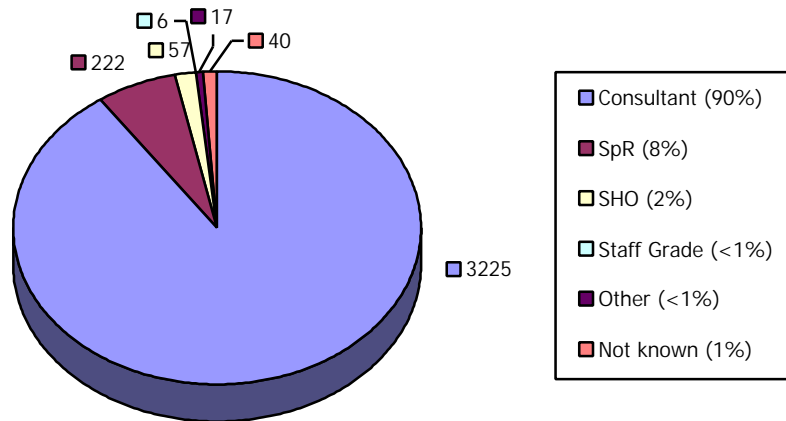
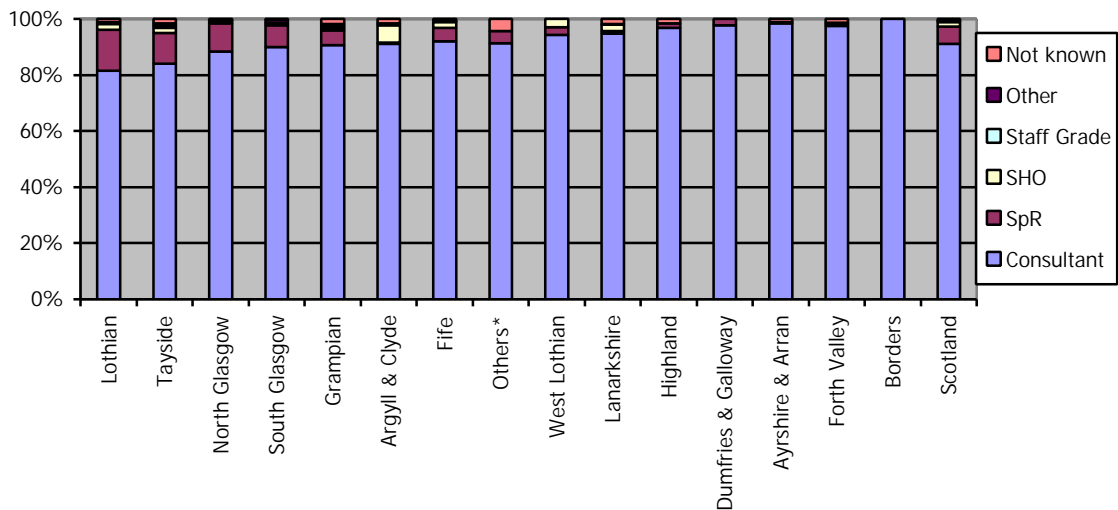
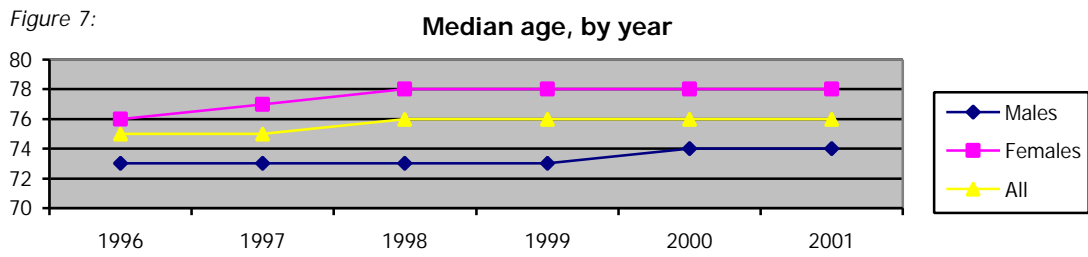
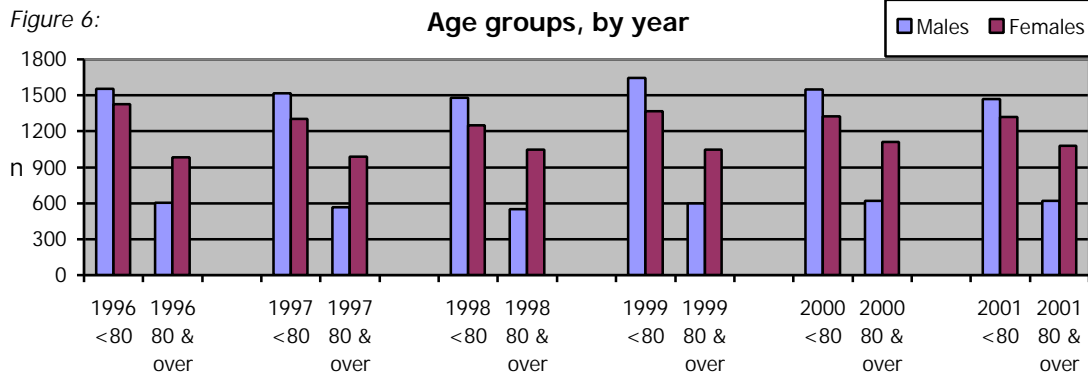


Figure 5:

Status of surgeon completing SASM form, by Trust

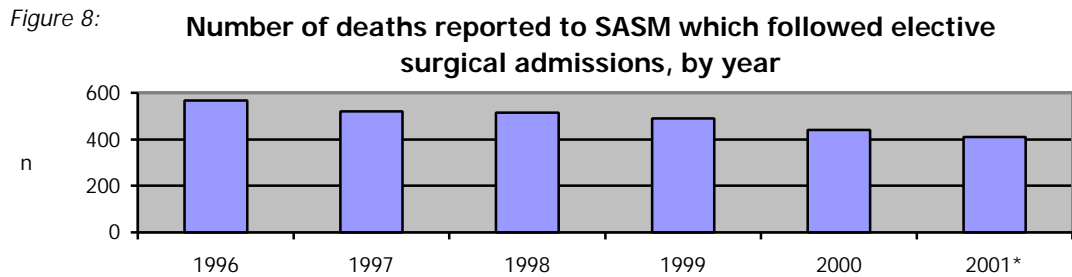


\*Small Health Boards, Trusts and Private Hospitals with fewer than 70 deaths during 2001



Test for trend: p value <0.0001

The p value here is very significant, which suggests that a trend exists. The above charts indicate that the age is increasing slightly over the years 1996 to 2001. These indicators combined suggest that there is a strong upward trend in the age distribution over time.



\*Elective total includes 7 deaths where admission was "previously cancelled elective"

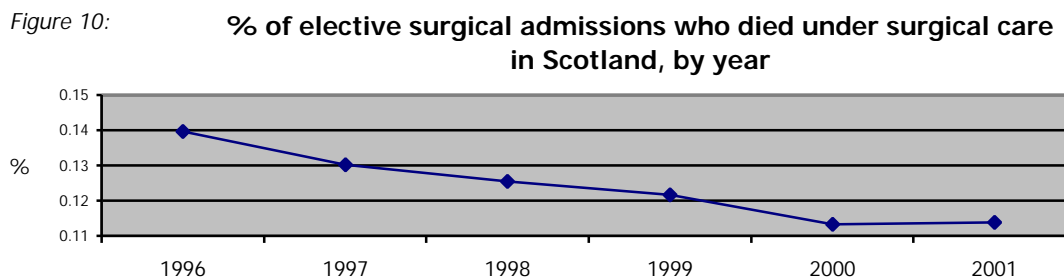
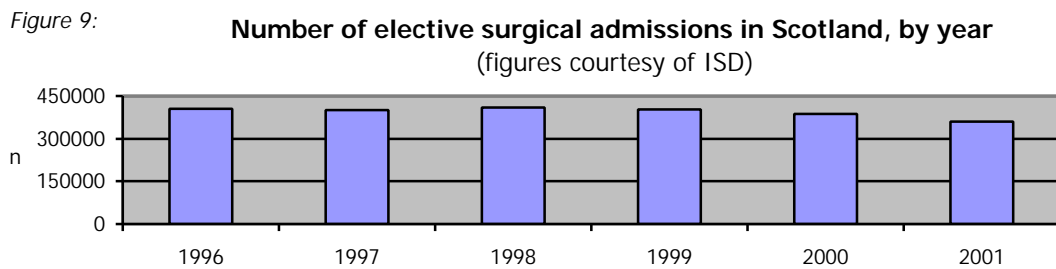


Table 1:  
Type of admission, by year

	1996		1997		1998		1999		2000		2001	
	n	%	n	%	n	%	n	%	n	%	n	%
Elective	566	16.1	521	15.9	514	14.5	489	15.0	440	12.2	410	11.7
Emergency	2944	83.9	2759	84.1	3021	85.5	2767	85.0	3180	87.8	3098	88.3
Unknown	1069		1096		805		1401		995		985	

Percentages shown exclude "unknown" cases, i.e. missing values

Chi-squared test: p value <0.0001

The p value is very significant, suggesting that there is a trend over the years. Figures in the table also support this and indicate that there is a downward trend in the number of elective patients who subsequently die.

Figure 11: Numbers of deaths reported to SASM which followed emergency surgical admissions, by year

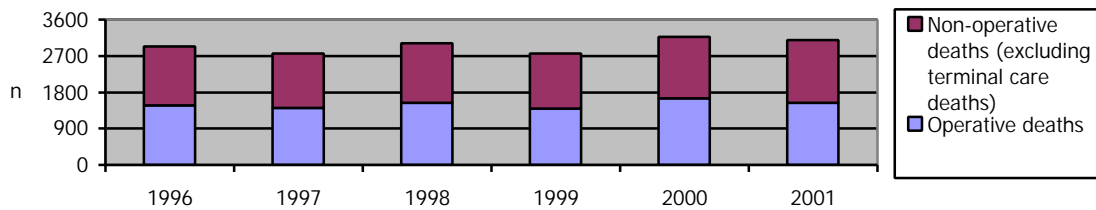


Figure 12: Number of emergency surgical admissions in Scotland, by year (figures courtesy of ISD)

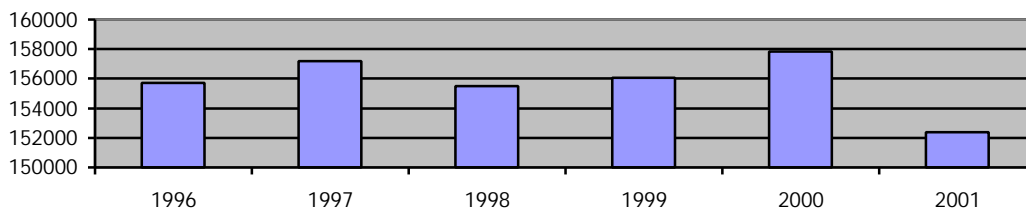


Figure 13: % of emergency surgical admissions in Scotland who died, by year

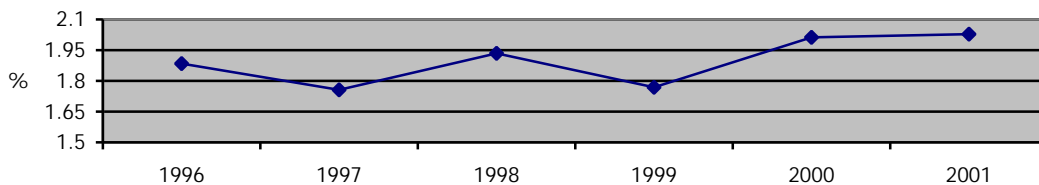


Figure 14: Emergency admissions by timing of 1st operation

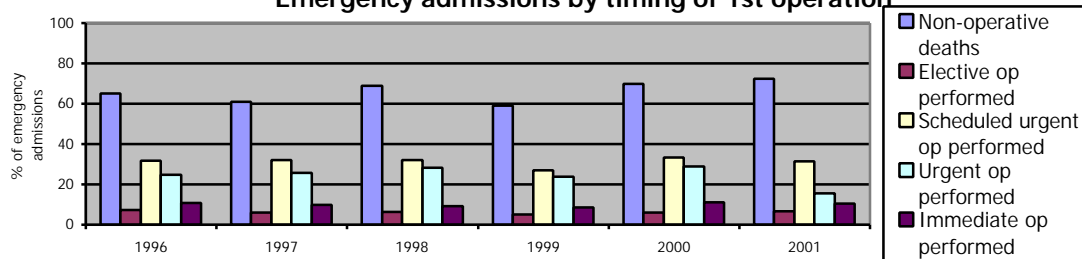


Table 2:

**Surgical assessors considered that case note reviews should be performed, by year**

	1996		1997		1998		1999		2000		2001	
	n	%	n	%	n	%	n	%	n	%	n	%
Yes	350	10.4	401	12.4	344	10.2	320	10.2	322	9.2	245	7.2
No	3024	89.6	2843	87.6	3014	89.8	2803	89.8	3191	90.8	3164	92.8
Unknown	184		168		237		148		159		158	

Percentages shown exclude "unknown" cases, i.e. missing values

Chi-squared test: p value <0.0001

The p value here is again significant, which suggests that a trend exists. The table (with the exception of 1997 data) suggests that there may be a downward trend in the percentage of cases where the surgical assessor considered a case note review should be performed.

Both the surgical assessor and the anaesthetic assessor are asked separately to make an overall statement describing any adverse events in management of the case. Figure 15 was derived, after excluding the terminal care cases and the non-returns, by counting firstly those cases where **either** the surgical or anaesthetic assessor said that adverse events caused death, then – of the remainder – counting those cases where **either** the surgical or anaesthetic assessor said that adverse events made a significant contribution to death, then – of the remainder – counting those cases where **either** the surgical or anaesthetic assessor said that adverse events made no difference to the outcome.

Figure 15:

**Statements by either surgical or anaesthetic assessor describing the adverse events in management of operative and non-operative deaths, by year**

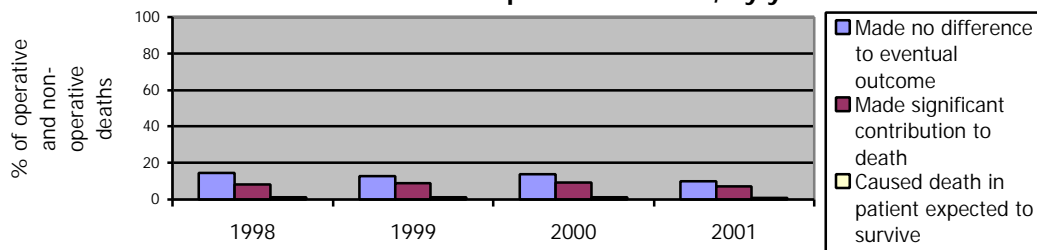


Table 3:

**Numbers of adverse events statements by either surgical assessors or anaesthetic assessors, operative and non-operative deaths, by year**

Statement	1998	1999	2000	2001
Made no difference to eventual outcome	474	455	448	330
Made significant contribution to death	285	343	334	268
Caused death in patient expected to survive	33	46	36	9
<b>Total number of operative and non-operative cases with an adverse event statement</b>	<b>792</b>	<b>844</b>	<b>818</b>	<b>607*</b>

\*This represents 17.1% of operative (n=1904) and non-operative deaths (n=1663) reported to SASM during 2001. Adverse events may be related to clinical, resource or other factors.

## Operative deaths (n = 1904)

Pre-operative data

Figure 16:

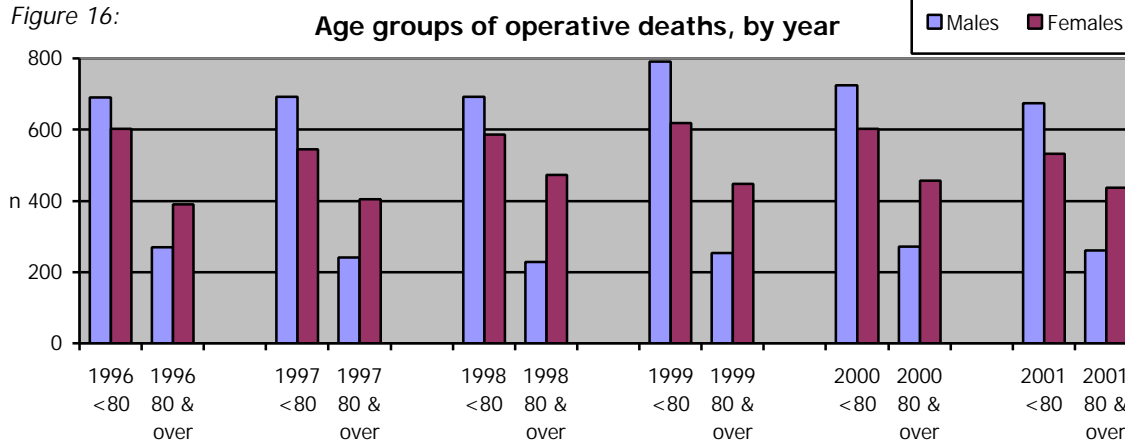
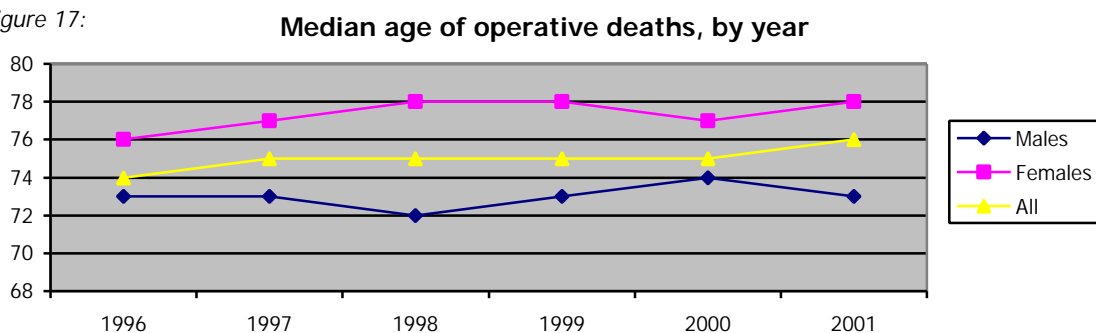


Figure 17:



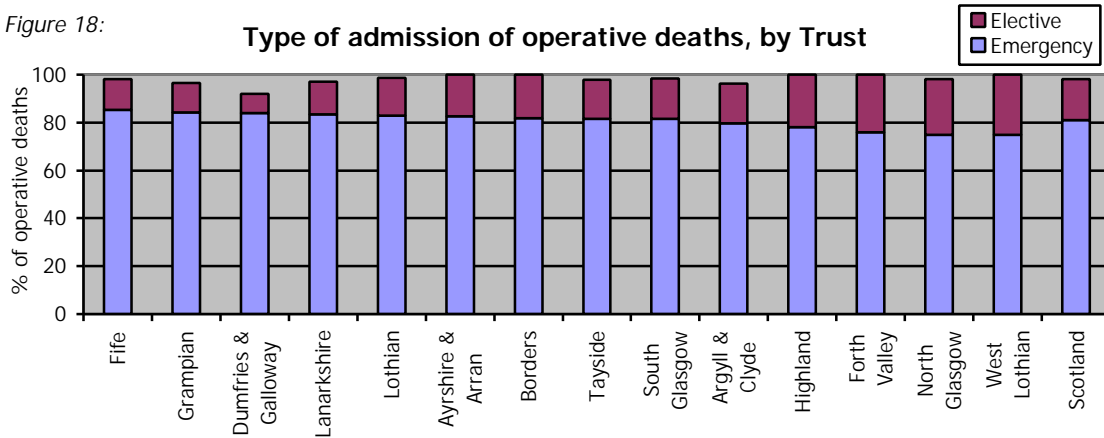
Test for trend: p value = 0.51

The p value here is rather high, suggesting that there is not a significant change in the age distribution over the years. This is reflected in the chart showing the median age over time.

Table 4:

Most common confirmed diagnoses operative deaths, 2001	n
Fractured neck of femur	272
Ca colon/rectum/anus	170
Peripheral vascular disease	107
Aortic aneurysm	103
Bowel infarction	77
Intestinal obstruction	73
Duodenal ulcer	59
Diverticular disease	56
Neurovascular disorder	51
Ca stomach	50
Ca oesophagus	42
Ca bladder	38
Peritonitis	35
Head injury	35
Ca pancreas	31
Gallbladder disorders	24
Gangrene	23
Pancreatitis	23

Figure 18:



NB – Excludes small Health Boards, Trusts and private hospitals with fewer than 70 deaths during 2001 (Where totals are not 100%, the remaining values were not declared)

Figure 19:

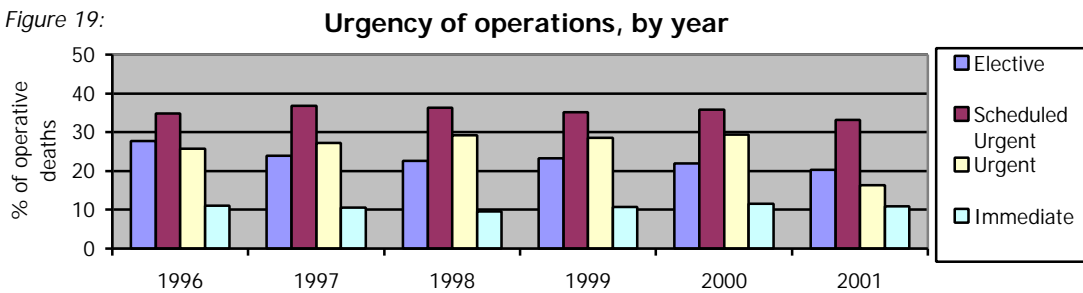


Table 5:

Urgency of operations, by year

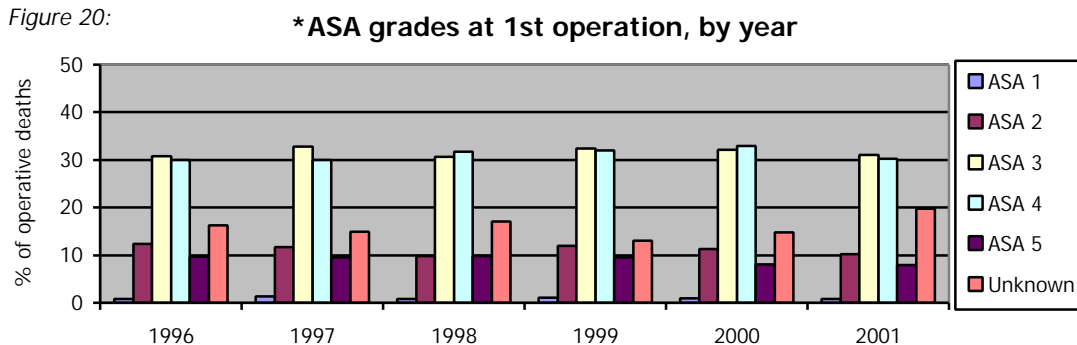
	1996		1997		1998		1999		2000		2001	
	n	%	n	%	n	%	n	%	n	%	n	%
Elective	541	27.84	449	24.23	449	23.22	491	23.80	450	22.20	385	25.00

Percentages shown exclude "unknown" cases, i.e. missing values

Chi-squared test: p value = 0.008

Here, the p value is significant, which suggests that a trend exists. With the exception of 2001 the figures in the table also suggest that there is a downward trend in the percentage of elective operations.

Figure 20:



\* ASA grades are a classification of the pre-operative severity of illness of the patient, ranging from ASA 1 - an otherwise fit patient, - to ASA 5 - a moribund patient with little chance of survival

Table 6:  
ASA grades at 1<sup>st</sup> operation, by year

	1996		1997		1998		1999		2000		2001	
	n	%	n	%	n	%	n	%	n	%	n	%
ASA 4	585	35.7	563	35.1	629	38.3	675	36.8	676	38.6	576	37.7

Percentages shown exclude "unknown" cases, i.e. missing values

Chi-squared test: p value = 0.175

The p value is not significant and suggests there is not a trend. Figures from the table do fluctuate and so show no clear trend in the percentage of patients in ASA grade 4.

Figure 21:

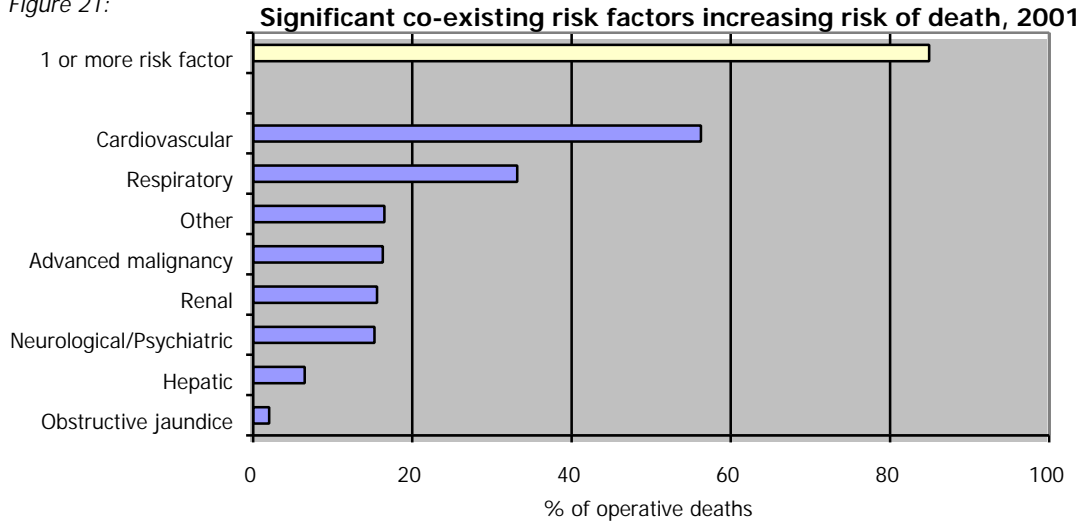


Table 7:  
% of consultants deciding on operation, by year

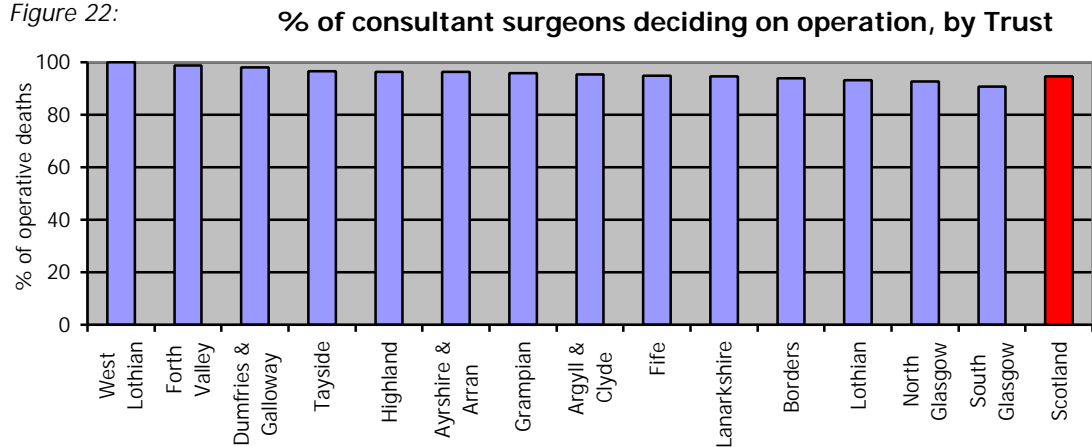
	1996		1997		1998		1999		2000		2001	
	n	%	n	%	n	%	n	%	n	%	n	%
Yes	1819	94.3	1738	94.0	1862	96.2	1991	96.2	1966	96.9	1803	97.3
No	110	5.7	110	6.0	74	3.8	78	3.8	62	3.1	50	2.7
Unknown	27		34		45		40		27		51	

Percentages shown exclude "unknown" cases, i.e. missing values

Chi-squared test: p value <0.0001

Here the p value is highly significant, which strongly suggests that a trend exists. Figures from the table also suggest that the trend is upwards.

Figure 22:



NB – Excludes small Health Boards, Trusts and private hospitals with fewer than 70 deaths during 2001

Figure 23: **Surgical assessor or anaesthetic assessor said that the journey of care up to the point of operation (including pre-admission) could have been improved, by year**

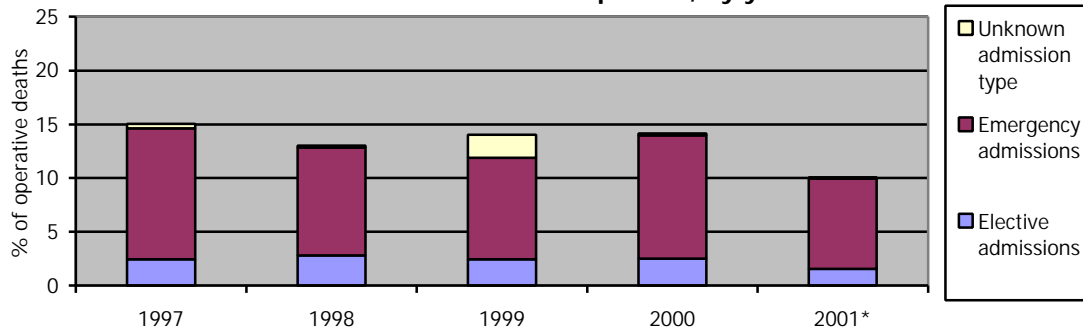


Table 8:

**\* Most common adverse events during 2001 where surgical assessor or anaesthetic assessor said that the journey of care up to the point of operation (including pre-admission) could have been improved**

Adverse event	n
Delay to surgery ie earlier op desirable	43
Pre-op assessment inadequate	26
Unsatisfactory medical management	15
Delay in transfer to surgical unit	15
Delay in transfer to surgeon by physicians	15
Op should not have been done	15
Failure to use HDU	10
Inadequate monitoring	10

## Operative deaths (n = 1904)

Intra-operative data

Table 9:

### Consultant surgeons operating or assisting, by year

	1996		1997		1998		1999		2000		2001	
	n	%	n	%	n	%	n	%	n	%	n	%
Yes	1307	70.8	1275	72.0	1358	72.2	1475	72.8	1502	75.7	1337	72.6
No	540	29.2	495	28.0	524	27.8	550	27.2	481	24.3	505	27.4
Unknown	109		112		99		84		72		62	

Percentages shown exclude "unknown" cases, i.e. missing values.

Chi-squared test: p value <0.0001

Despite the fall in the percentage of operative cases where a consultant surgeon operated or assisted in 2001, the p value here is highly significant, which strongly suggests that an upward trend exists.

Table 10:

### Surgical assessor criticised the grade/experience of surgeon operating, by year

	1996		1997		1998		1999		2000		2001	
	n	%	n	%	n	%	n	%	n	%	n	%
Yes	48	2.8	56	3.4	52	3.1	60	3.1	30	1.7	28	1.7
No	1672	97.2	1588	96.6	1610	96.9	1845	96.9	1762	98.3	1576	98.3
Unknown	236		238		319		204		263		300	

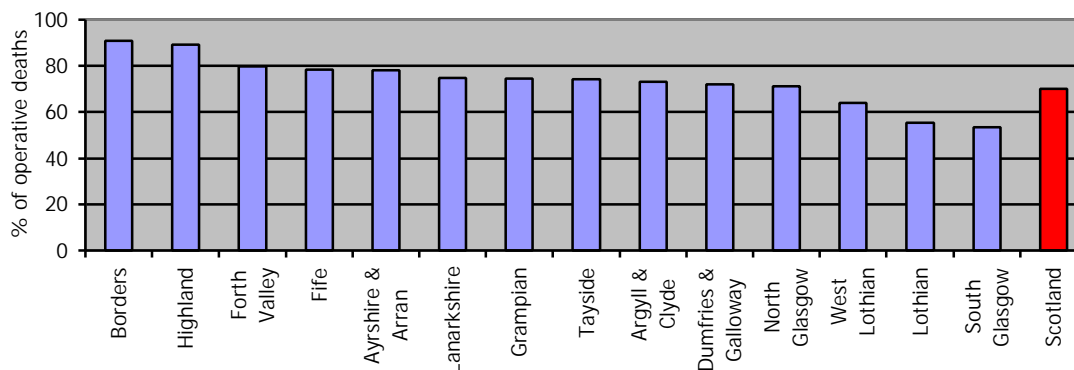
Percentages shown exclude "unknown" cases, i.e. missing values.

Chi-squared test: p value = 0.007

Here the p value is significant and indicates that a trend exists. The figures in the table suggest that there seems to be a trend possibly within the first 3 years before leveling off in 1998/1999 and then falling dramatically in the year 2000.

Figure 24:

### Consultant surgeons operating or assisting, by Trust



NB – Excludes small Health Boards, Trusts and private hospitals with fewer than 70 deaths during 2001

Table 11:

### Consultant anaesthetist present, by year

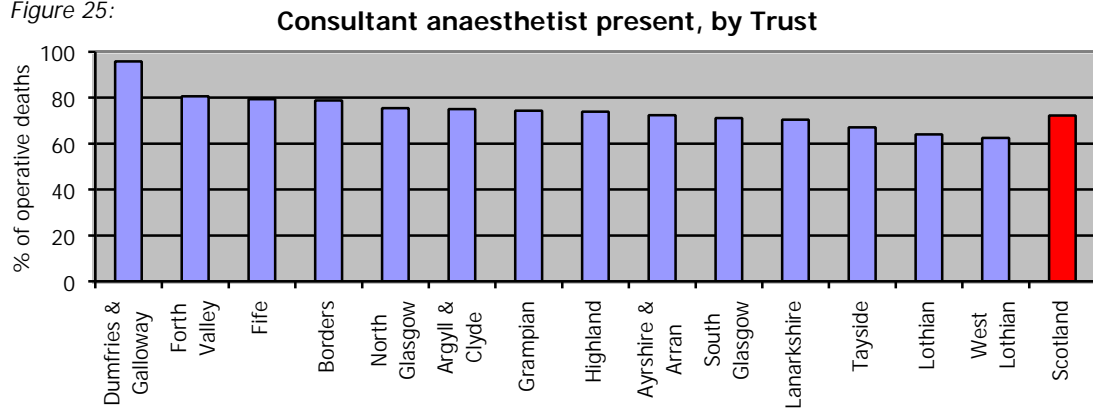
	1996		1997		1998		1999		2000		2001	
	n	%	n	%	n	%	n	%	n	%	n	%
Yes	1020	61.8	1060	65.9	1103	67.1	1227	67.0	1222	69.9	1117	73.0
No	631	38.2	548	34.1	540	32.9	603	33.0	525	30.1	413	27.0
Unknown	305		274		338		279		175		16	

Percentages shown exclude "unknown" cases, i.e. missing values

Chi-squared test: p value <0.0001

Here the p value is highly significant which strongly suggests that a trend exists. Figures in the table also indicate that there is an upward trend in the percentage of operative cases where an anaesthetist was present.

Figure 25:



NB – Excludes small Health Boards, Trusts and private hospitals with fewer than 70 deaths during 2001

Figure 26:

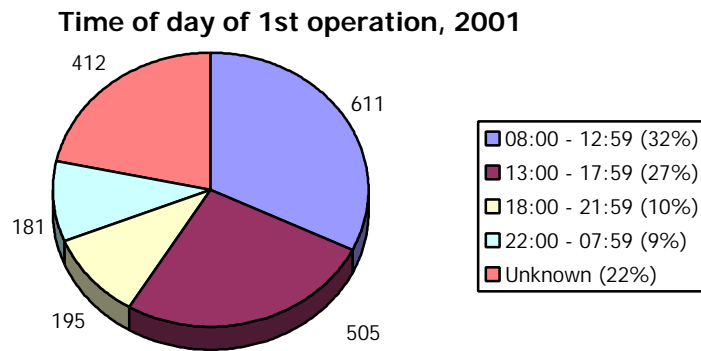
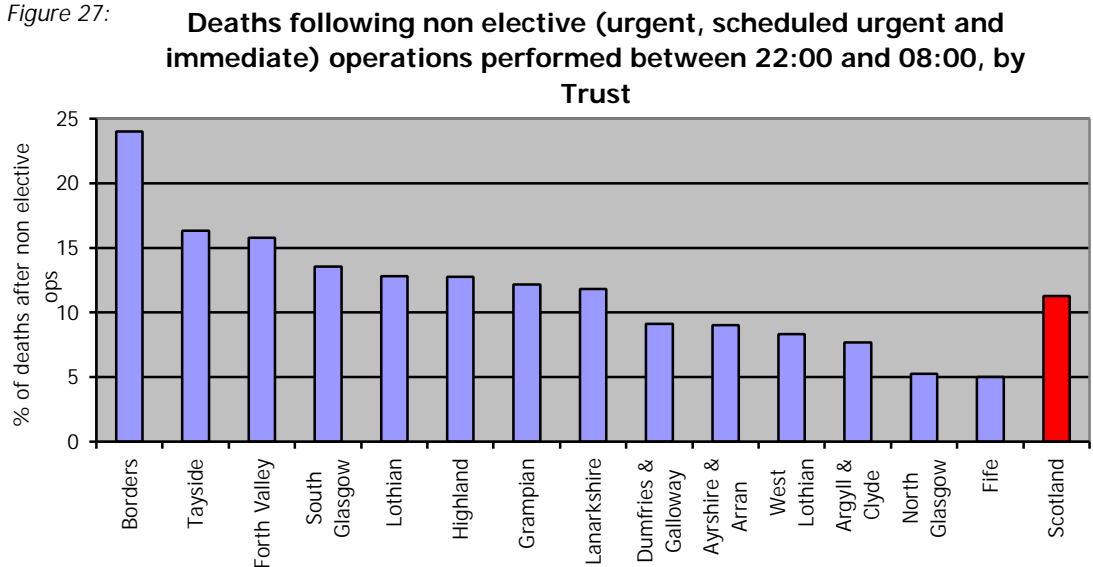


Figure 27:



This graph may be a product of the type of cases a Trust receives (e.g. neurosurgery for a large population) or the availability of dedicated emergency operating theatres and the necessary staff to man them.

Table 12:

**Surgical assessors commented adversely on timing of operation, by year**

	1997		1998		1999		2000		2001	
	n	%	n	%	n	%	n	%	n	%
Yes	79	4.8	76	4.6	83	4.3	74	4.1	72	4.5
No	1574	95.2	1590	95.4	1826	95.7	1716	95.9	1534	95.5
Unknown	229		315		200		265		298	

Percentages shown exclude "unknown" cases, i.e. missing values

Chi-squared test: p value = 0.850

The p value here is rather high, indicating that there is not a significant change over the years in the percentage of surgical assessors who commented adversely on the timing of the operation.

Table 13:

**Surgical assessors commented adversely on choice of operation, by year**

	1997		1998		1999		2000		2001	
	n	%	n	%	n	%	n	%	n	%
Yes	45	2.5	42	2.2	71	3.6	36	1.9	51	2.9
No	1782	97.5	1844	97.8	1919	96.4	1864	98.1	1705	97.1
Unknown	55		95		119		155		148	

Percentages shown exclude "unknown" cases, i.e. missing values

Chi-squared test: p value = 0.012

The p value here is significant and suggests a change over the years in the percentage of surgical assessors commenting adversely on the choice of operation.

## Operative deaths (n = 1904)

Post-operative data

Figure 28: **Surgical assessor or anaesthetic assessor said post-operative care could have been improved, by year**

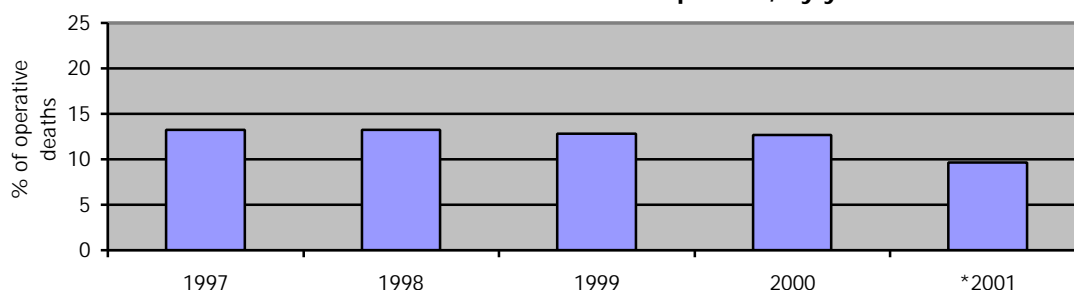


Table 14:

\* **Specialty of cases where surgical assessor or anaesthetic assessor said post-operative care could have been improved during 2001**

Specialty	n	Number of operative deaths in speciality	% where post-op care could have been improved
General surgery	71	912	7.8
Orthopaedics	70	370	18.9
Vascular surgery	22	296	7.4
Neurosurgery	10	115	8.7
Urology	4	71	5.6
GI	4	64	6.3
Gynaecology	1	26	3.8
ENT	1	24	4.2
Maxillofacial	1	5	20

Table 15:

\* **Most common adverse events where surgical assessor or anaesthetic assessor said post-operative care could have been improved during 2001**

Adverse event	n
Unsatisfactory medical management	43
Failure to use HDU	42
Delay in recognising complications	17
Inadequate monitoring	14
Poor documentation	13
Failure to use ITU	11
Respiratory tract complications	8
Pre-operative assessment inadequate	8
Delay to surgery	7
Failure to use DVT prophylaxis	7
Transfer necessary to obtain ITU bed	6

## Operative deaths (n = 1904)

Assessors' data

Both the surgical assessor and the anaesthetic assessor are asked separately to make an overall statement describing any adverse events in management of the case. Figure 29 was derived by counting firstly those cases where **either** the surgical or anaesthetic assessor said that adverse events caused death, then – of the remainder – counting those cases where **either** the surgical or anaesthetic assessor said that adverse events made a significant contribution to death, then – of the remainder – counting those cases where **either** the surgical or anaesthetic assessor said that adverse events made no difference to the outcome.

Figure 29: **Statements by either surgical or anaesthetic assessor describing the adverse events in management of operative deaths, by year**

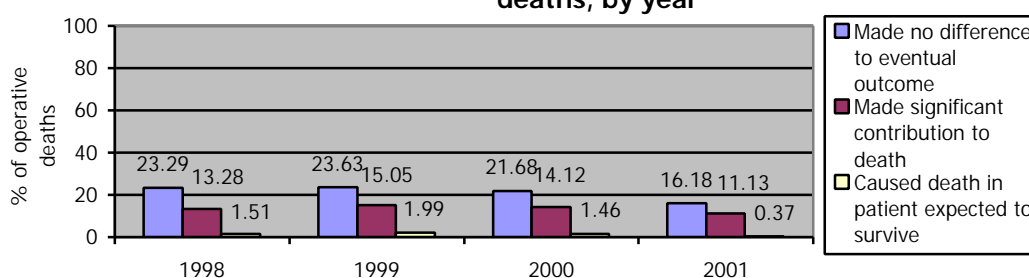


Table 16: **Adverse events statements by either surgical or anaesthetic assessors, operative deaths, by year**

Statement	1998	1999	2000	2001
Made no difference to eventual outcome	394	415	377	275
Made significant contribution to death	259	311	286	230
Caused death in patient expected to survive	30	42	30	7
<b>Total</b>	<b>683</b>	<b>768</b>	<b>693</b>	<b>512</b>

Table 17: **Adverse events statements by surgical assessors, operative deaths, by year**

Statement	1998	1999	2000	2001
Made no difference to eventual outcome	294	283	255	195
Made significant contribution to death	203	255	230	188
Caused death in patient expected to survive	29	38	24	6

Table 18: **Adverse events statements by anaesthetic assessors, operative deaths, by year**

Statement	1998	1999	2000	2001
Made no difference to eventual outcome	251	288	270	182
Made significant contribution to death	116	130	132	94
Caused death in patient expected to survive	5	10	11	4

Table 19:

**Most common adverse events – operative deaths, 2001**

<b>Surgical assessors' opinions</b>	<b>n</b>
Delay to surgery ie earlier operation desirable	49
Unsatisfactory medical management	33
Wrong operation performed	31
Surgeon too junior	28
Failure to use HDU	26
Operation should not have been done or was unnecessary	24
Lower GI complication of open surgery	16
Delay in recognising complications	16
Bleeding or coagulation problems	15
Delay in transfer to surgeon by physicians	15
Poor documentation	15
Delay in transfer to surgical unit	15
Upper GI complication of open surgery	13
Pre-operative assessment inadequate	13
Diagnosis missed by surgeons	10
Resuscitation inadequate	10

Table 20:

**Most common adverse events – operative deaths, 2001**

<b>Anaesthetic assessors' opinions</b>	<b>n</b>
Failure to use HDU	38
Unsatisfactory medical management	37
Delay to surgery ie earlier operation desirable	27
Inadequate monitoring	22
Pre-operative assessment inadequate	19
Poor documentation	17
Delay in recognising complications	12
Resuscitation inadequate	12
Delay in transfer to surgical unit	11
Anaesthetist too junior	11
General anaesthetic complications	9
Operation should not have been done or was unnecessary	9
Failure to use ITU	8
Wrong operation performed	8
Delay in transfer to surgeon by physicians	7
Failure of junior anaesthetist to seek advice	6

### Non-operative deaths (n = 1663) (excluding terminal care deaths)

Figure 30:

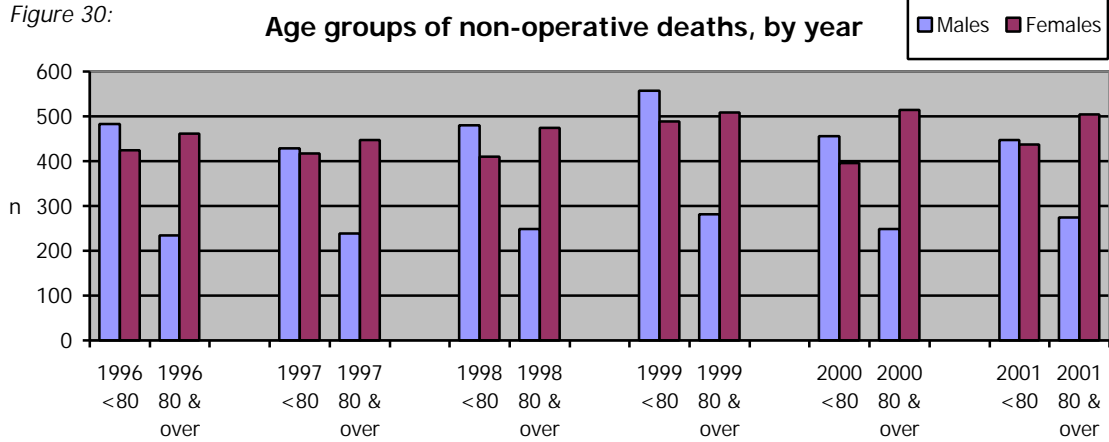
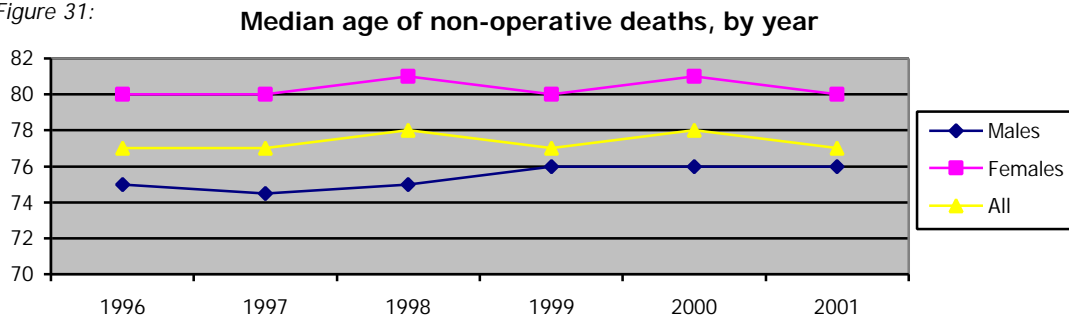


Figure 31:



Test for trend: p value <0.0001

The p value suggests that there is a trend, however the charts indicate that figures are rather erratic over the years.

Table 21:

Most common surgical diagnoses (not necessarily cause of death) non-operative deaths, 2001	n
Peripheral vascular disease	113
Aortic aneurysm	97
Fracture of neck of femur	85
Acute pancreatitis	70
Ca colon/rectum/anus	62
Bowel infarction	62
Neurovascular disorders	61
Head injury	52

Peritonitis	47
Diverticular disease	42
Intestinal obstruction	37
Ca liver	31
Ca bladder	28
Ca pancreas	28
Ca oesophagus	27

Figure 32:

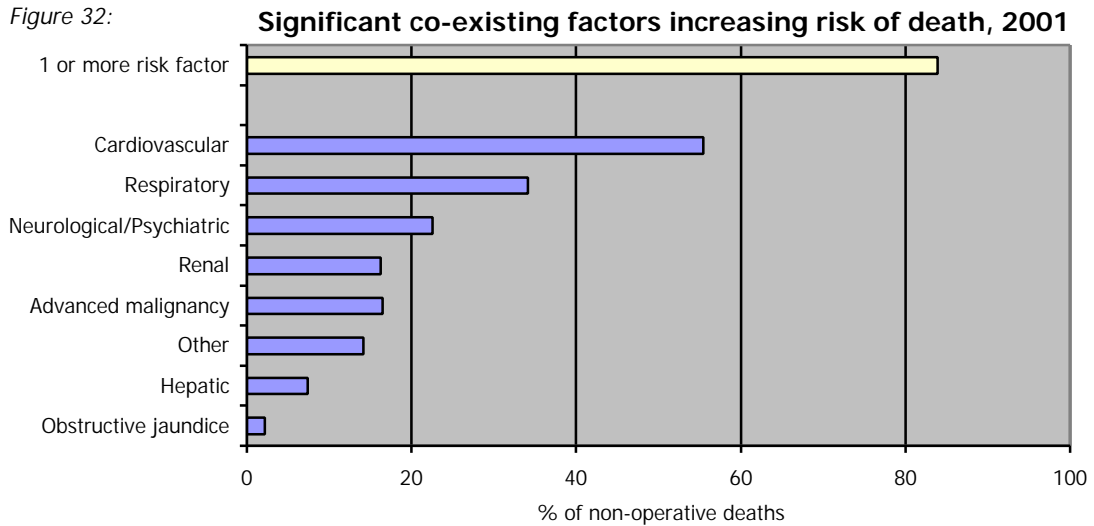


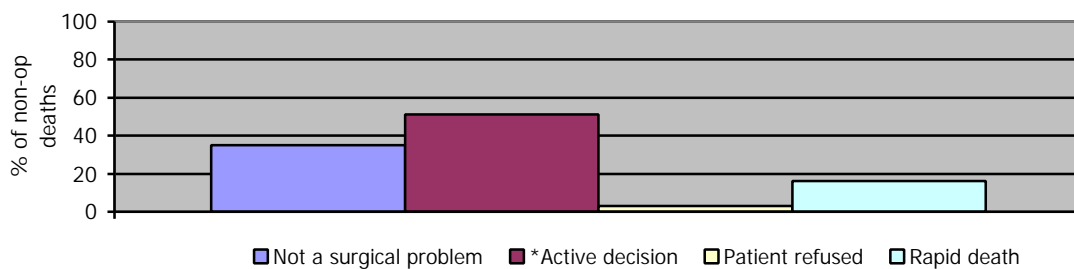
Table 22:

**Most common diagnoses for non-operative cases with no risk factors**

Most common diagnoses	n
Malignancy	83
Neurovascular	36
Head injury	23
Acute pancreatitis	14
Aortic aneurysm	13

Figure 33:

**Surgeons' statements on why no operation was performed, 2001**



\*This decision was taken by a consultant surgeon in 94% of cases

Table 23:

**Surgical assessors considered that an operation should have been performed, by year**

	1996		1997		1998		1999		2000		2001	
	n	%	n	%	n	%	n	%	n	%	n	%
Yes	28	1.8	19	1.3	20	1.4	20	1.9	19	1.2	23	1.5
No	1516	98.2	1427	98.7	1441	98.6	1044	98.1	1503	98.8	1492	98.5
Unknown	59		84		153		98		95		148	

Percentages shown exclude "unknown" cases, i.e. missing values

Chi-squared test: p value <0.0001

The p value here is highly significant, which suggests that a trend exists. However the figures in the table indicate that figures are rather erratic over the years.

The surgical assessor is asked to make an overall statement describing any adverse events in management of the case. Figure 34 was derived by counting firstly those cases where the surgical assessor said that adverse events caused death, then – of the remainder – counting those cases where the surgical assessor said that adverse events made a significant contribution to death, then – of the remainder – counting those cases where the surgical assessor said that adverse events made no difference to the outcome.

Figure 34: **Surgical assessors' statements describing the adverse events in management of non-operative deaths, by year**

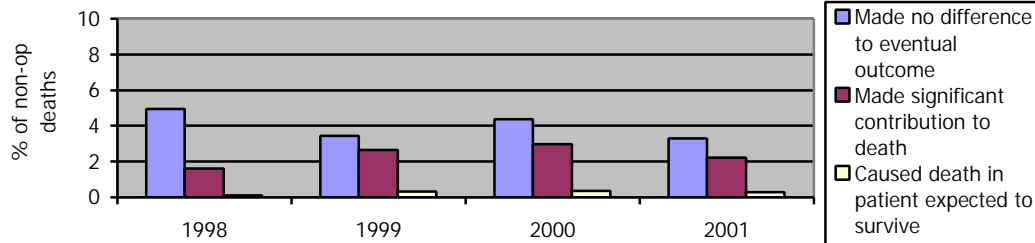


Table 24:

**Actual numbers of adverse events statements by surgical assessors, non-operative deaths, by year**

Statement	1998	1999	2000	2001
Made no difference to eventual outcome	80	40	71	55
Made significant contribution to death	26	31	48	38
Caused death in patient expected to survive	2	4	6	2*

Table 25:

\* The adverse events attributed to these deaths are

Case	*Adverse event (1)	*Adverse event (2)	*Adverse event (3)
1	Diagnosis missed		
2	Delay to diagnosis	Resuscitation inadequate	Delay in transfer to surgical unit

Table 26:

**Surgical assessors stated that there were adverse events in management of non-operative cases, and the percentage of this group where the adverse events caused death or contributed to death**

	1998		1999		2000		2001	
	n	%	n	%	n	%	n	%
Adverse event caused/contributed	28	25.9	35	46.7	54	43.2	40	42.1

Percentages shown exclude "unknown" cases, i.e. missing values.

Chi-squared test: p value = 0.055

The statistics do not suggest that, where there was an adverse event in management, there is any trend in the percentage of those which caused or contributed to the death of the patient.

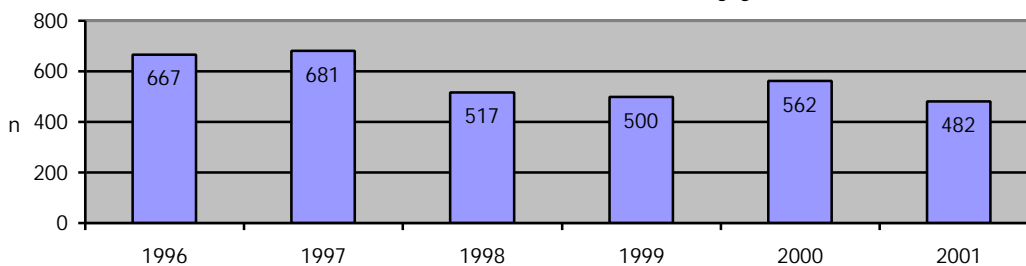
Table 27:

Surgical assessors – most common adverse events non-operative deaths, 2001	n
Delay in transfer to surgical unit	20
Poor documentation	16
Diagnosis missed	11
Inappropriate surgical admission	9
Operation should have been done	6
Delay to surgery ie earlier operation desirable	5
Failure to use DVT prophylaxis	5

### Terminal care deaths (n = 482)

(Cases admitted for terminal care under the care of a surgeon)

Figure 35: **Number of terminal care deaths, by year**



There must be a question as to whether an acute surgical ward is the appropriate environment for these patients

Figure 36: **Age groups of terminal care deaths, by year**

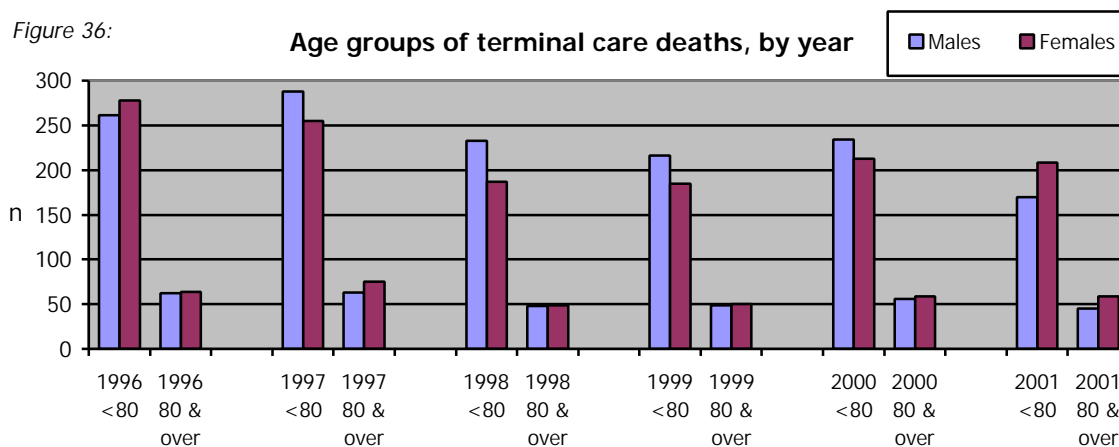
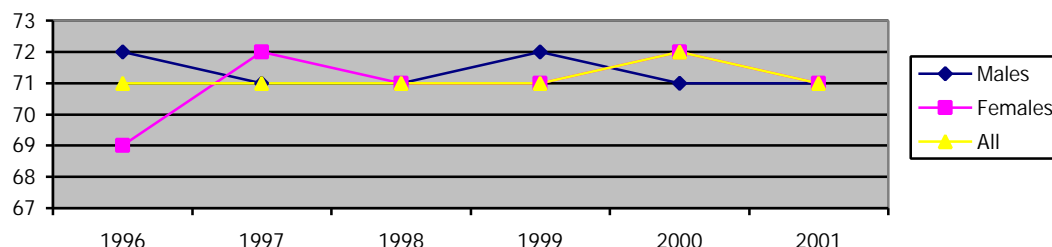


Figure 37: **Median age of terminal care deaths, by year**



Test for trend: p value = 0.048

The p value here suggests that there is a trend. However the charts indicate that figures may be rather erratic over the years.

Table 28:

Most common sites of cancer (terminal care deaths, 2001)	n
Colon, rectum and anus	81
Breast	53
Oesophagus	44
Bladder	43
Stomach	38
Prostate	34
Ovary	33
Pancreas	32