



ROYAL AUSTRALASIAN COLLEGE OF SURGEONS

ANNUAL REPORT

Tasmanian Audit of Surgical Mortality



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Abbreviations

ANZASM	Australian and New Zealand Audit of Surgical Mortality
CPD	Continuing Professional Development
DoC	Deficiencies of Care
DoH	Department of Health
DHHS	Department of Health and Human Services
DVT	Deep Vein Thrombosis
HDU	High Dependency Unit
ICU	Intensive Care Unit
n	Number
RACS	Royal Australasian College of Surgeons
SASM	Scottish Audit of Surgical Mortality
SoC	Suboptimal Care
TASM	Tasmanian Audit of Surgical Mortality
UTAS	University of Tasmania
WA	Western Australia
WAASM	Western Australian Audit of Surgical Mortality

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Chairman's Report

Tasmania was the second Australian state to introduce a voluntary audit of surgical mortality (known as the Tasmanian Audit of Surgical Mortality or 'TASM'). This follows the successful introduction of the WA Audit of Surgical Mortality in West Australia in 2002. Other Australian states and New Zealand are in discussion or in the process of implementing similar audits. Whilst Tasmania's population is relatively small the data collected by the audit will be of significant value in improving surgical outcomes.

Tasmania involves non-members of the Royal Australasian College of Surgeons (RACS), anaesthetists, obstetricians and ophthalmologists ("potential participants") in their audit. Our Committee considers the involvement of these non RACS participants in addition to their own members as most valuable and will hopefully cover all surgical deaths in Tasmania. The audit has been accepted by the RACS for points towards continuing professional development (CPD).

Currently 92 (92%) of surgeons are involved in the audit. This inaugural report covers 274 surgical deaths in Tasmania for the period September 2004 to February 2006. Early results show 8% of cases reviewed were associated with an area of concern or adverse event. Some were considered preventable and this should be looked into. DVT prophylaxis, HDU/ICU access and the grade of operating surgeon have been identified as areas that could be improved.

Initially there were difficulties in reassuring potential participants that their data would remain confidential. Now this "big brother" concern has largely been replaced with enthusiasm and the realisation that the audit seeks to focus on improvement in the process of surgical care and not on individual surgical ability. The underlying principle of the audit

is the recognition that surgical care is system based.

It is hoped that the public will accept TASM as a peer review audit undertaken voluntarily by participants, thereby ensuring that every surgical death in Tasmania is scrutinised independently and the collective results of that scrutiny are widely and freely disseminated resulting in improved care. It is the Committee's hope that those who currently do not participate in TASM, will be encouraged to do so by the hospitals and the wider community. Participation in the audit may become a pre-requisite in hospital reaccreditation requirements. This in turn will direct the attention of hospitals and the health departments to provide the necessary clinical time, support staff and infrastructure to successfully support TASM. Ultimately the findings of TASM may demonstrate deficiencies in surgical procedures, staffing in hospitals, access to high dependency beds and other resource matters that will then need to be addressed by all stakeholders.

At the core of TASM is the independent external first and second line reviews. Whilst to date the numbers of cases recommended for second line review are few, completed reviews have been detailed, insightful and balanced. TASM acknowledges the essential contribution of all reviewers and also acknowledges and thanks the Tasmanian hospitals, for agreeing to support this process and allowing TASM access to their clinical records. The Department of Health and Human Services has been extremely supportive and has provided funding to enable the employment of staff to facilitate TASM. I wish to thank our coordinator whose enthusiasm, dedication and efforts have resulted in the successful establishment of TASM as a functioning surgical audit.

Rob Bohmer
Chairman

Executive Summary

The Tasmanian Audit of Surgical Mortality (TASM) is an external independent peer review audit of the process of care associated with surgically related deaths in Tasmania. TASM is funded by the Tasmanian Department of Health & Human Services (DHHS) and is managed by the Royal Australasian College of Surgeons (RACS). In 2005 the RACS formed the Australian and New Zealand Audit of Surgical Mortality (ANZASM) program with the purpose of establishing similar mortality audits in all states and territories, as well as New Zealand. TASM has qualified privilege under both State and Commonwealth legislation.

Audit participation

Participation in TASM is voluntary. This is the first annual report of TASM and there are no comparable statistics. In the 18 months from September 2004 to February 2006, 274 surgically related deaths were reported to TASM. At the time of analysis, 143 (66.1%) of these had completed the audit process. There is a time lag associated with the audit process and a further 11.7% of cases were still in progress. There were 63 surgeons associated with the reported deaths. During the audit period, deaths associated with 15 non-participating surgeons were not included, however 13 of those surgeons now participate.

Results

There were 143 completed audit deaths (excluding terminal deaths) reported to TASM from September 2004 to February 2006.

The median age of patients was 77 years. In 86% of cases, one or more significant comorbidities were associated that contributed towards death.

Areas for consideration, of concern or adverse events

An area of concern or adverse event (Deficiency of Care, DoC) was associated in 11/143 (8%) of cases.

In 4 (3%) cases assessors determined that a preventable adverse event may have caused the death of a patient.

Elective and emergency admissions

- There were more emergency admissions 118 (83%) than elective admissions 25 (17%) in the audited cases.
- Elective admissions were associated with a significantly higher proportion of deficiencies of care (DoC) than emergency admissions (20% v 5.1%)
- For elective admissions, 92% underwent an operative procedure compared to 64% of emergency admissions.

Operative and non-operative deaths

- An operation was performed in 98 (69%) cases.
- Operative cases were associated with a significantly higher proportion of DoC than non-operative cases (10% v 2%).
- In 11% of operative cases, the operation was abandoned on finding a terminal situation.

Grade of surgeon – teaching hospitals

First (initial) operations were undertaken in 60% of cases by a consultant surgeon and 29% by an advanced surgical trainee or registrar. In 11% of cases the data was not available.

DVT prophylaxis

The decision to use DVT prophylaxis was deemed appropriate in 83% of cases assessed.

Post Mortems

- A hospital or coronial post-mortem was known to be conducted in 25 surgically related deaths. In 90 cases there was no post-mortem and in 4 cases a post-mortem was refused. There were 24 cases where this data was unknown or missing.
- Of the five surgeons who had read post-mortem reports, one said it added additional information.
- Eleven surgeons reported that they would have preferred a post mortem where none had been done.

Recommendations

- Increased participation in TASM.
- Review commitment of surgeons to more accurate and complete data entry of the audit proforma.
- Liaise with Coroner to establish a timely and robust mechanism for the return of post-mortem results to the responsible clinician.
- Increased communication with other states and territories where similar audits are in progress.
- Establish inter-state second line assessment, especially for small specialties.
- TASM to provide clinicians with their commencement date of participation in the audit for RACS and CPD records and for submission to hospitals for clinical governance and accreditation purposes.
- Areas of concern and adverse events that were considered preventable should be reviewed and recommendations made as to future action to rectify practices.
- Increased use and the availability of HDU/ICU beds should be considered.
- DVT prophylaxis should be reviewed.
- The grade of surgeon operating at second operation should be reviewed.

Introduction

Project Description & Background

TASM is an external independent peer review audit of the process of care associated with surgically related deaths in Tasmania. TASM methodology is based on the Scottish Audit of Surgical Mortality (SASM).¹ The SASM methodology was used by WAASM on the 1st June 2001 as a pilot study in five participating hospitals in the metropolitan area of Perth. The project was extended to all Western Australian hospitals in November 2001 where surgical procedures take place. This project commenced in Tasmania on September 2004.

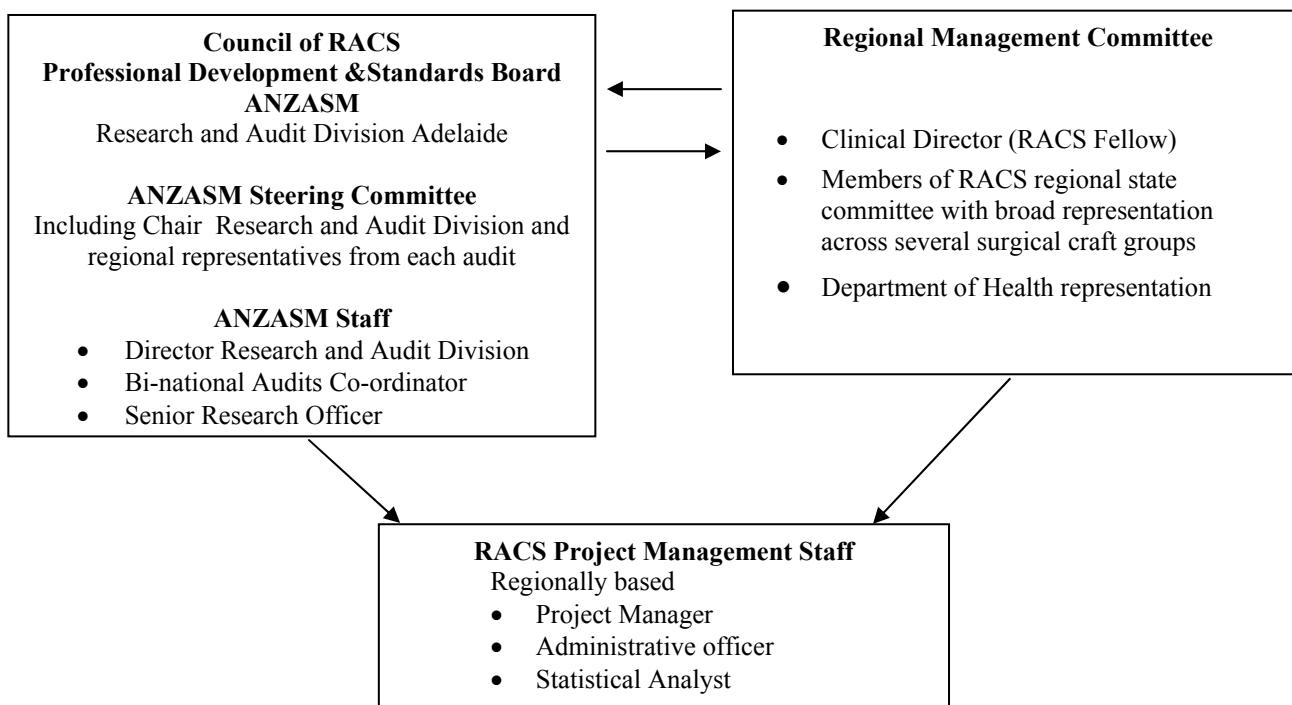
Project Governance Structure

TASM is funded by the DHHS. In 2005 the RACS formed the ANZASM, with the purpose of extending similar mortality audits to other states and territories which were not already participating in the audit. TASM is managed by the RACS.

The RACS TASM Management Committee is registered under the *Health Act 1997 (Tas)* and also has protection under the Commonwealth Qualified Privilege Scheme under Part VC of the *Health Insurance Act 1973* (Gazetted 7th November 2001).

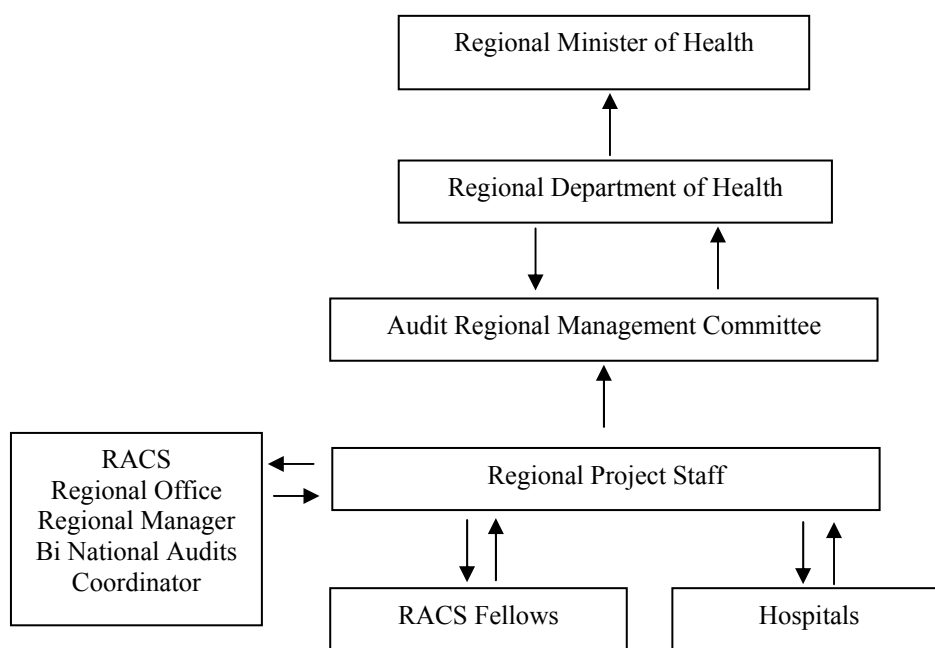
Figures 1 and 2 illustrate the RACS and regional governance structures surrounding each regional audit of surgical mortality. A bi-national ANZASM Steering Committee oversees the functioning and strategic directions of all regional audits and provides input into national reporting. Members of this steering committee include the Chair of the Research and Audit Division of RACS and all regional Clinical Directors (or designated proxies), and is supported by Research and Audit Division staff.

Figure 1: Governance Structure : National and Regional



¹ www.sasm.org.uk

Figure 2: Regional Audit Governance Structure



Description of the Audit Process

Notification of Deaths

TASM is notified of deaths that occur in private and public hospitals throughout Tasmania by the various medical records departments.

Participation

Participation in TASM is voluntary. The core audit process is a confidential peer review of surgical mortality and educational feedback to surgeons. The majority of surgeons in Tasmania participate in TASM. Surgeons complete and sign a form indicating whether they agree to participate in the audit and whether they agree to be first and/or second line assessors.

Methods

After notification of a death, TASM sends the associated consultant surgeon a proforma for completion. This proforma is returned to TASM and anonymously assessed by a first line assessor. He/she will determine if the case should undergo a second line assessment (Appendix 1). These second line case note reviews are undertaken where deficiencies of care are thought to have occurred during the

pathway of care before death or where a review could usefully draw attention to lessons that might be learnt, either for clinicians involved in the case or as part of collated assessments for wider distribution. Surgeons receive feedback from assessors on their cases. Feedback disseminated to all surgeons, hospitals or the public is aggregated and anonymised. Events are not linked to patients, surgeons or hospitals. The process is managed by the TASM team and co-ordinated through an extensive database.

Feedback

The core purpose of TASM is the feedback of information to inform, educate and facilitate change and improve practice. TASM provides feedback in the following ways:

- Individual surgeons receive feedback from first and/or second line assessors on their cases.
- All surgeons will receive summaries of second line reviews, newsletters and copies of annual reports.
- The participating hospitals will receive reports on aggregated anonymised data relating specifically to their hospital.

- TASM will report its results annually. Information is aggregated and anonymous. No information is available on individual patients, surgeons or hospitals.

Audit Inclusion / Exclusion Criteria

TASM audits all deaths that occur in hospital whilst under the care of a surgeon, regardless of whether an operation has occurred or not. If a patient is admitted under the care of a physician and subsequently undergoes an operative procedure, the case is included in the audit process. Terminal care cases are excluded.

Deaths that are relevant to the audit fulfil the following criteria:

- Category 1: Surgical death during admission.
- Category 2: Non-operative deaths
- Category 3: Surgical death within 30 days.

Definitions

Assessment Outcomes

Surgeons and assessors report deficiencies of care in relation to the following criteria:

- **Area for consideration:** where the clinician believes areas of care could have been improved or different, but recognises that it may be an area for debate.
- **Area of concern:** where the clinician believes that areas of care should have been better.
- **Adverse Event:** an unintended ‘injury’ caused by medical management rather than by the disease process, which is sufficiently serious to lead to prolonged hospitalisation or to temporary or permanent impairment or disability of the patient at the time of discharge, or which contributes to or causes death.

Surgeons and assessors determine the impact of the incident on the outcome as to whether it:

- made no difference to the outcome;
- may have contributed to death; or
- caused the death of the patient who would otherwise been expected to survive.

Surgeons and assessors give their opinion as to whether the incident was preventable:

- definitely;
- probably;
- probably not; or
- definitely not.

The surgeon and assessors indicate who the incident was associated with i.e.:

- audited surgical team;
- another clinical team;
- the hospital; or
- other

Suboptimal care and deficiencies of care

For reporting, events are grouped into suboptimal care or deficiencies of care.

- **Suboptimal Care (SoC):** includes all events (consideration, concern and adverse events).
- **Deficiencies of Care (DoC):** includes only areas of concern and adverse events. Areas for consideration have been excluded because these events usually make no difference to outcome and are an indication that there were different options.

Some cases are associated with more than one incident of deficient care. Where analysis of events is reported by case, the most serious event has been ascribed to the case.

The analyses contained in this report are of events subscribed to the case by either the first or second line assessors.

The events and the effect on outcome are the opinion of the assessors.

Audit Participation

Key Points

- Audit participation is voluntary and includes RACS members, members of other Colleges and non RACS members and now stands at 92% of potential participants.
- 274 cases were reported to TASM during the 18 month period from 1 September 2004 to 28 February 2006
- At the time of analysis, 78% of proformas sent to surgeons were returned.
- At private hospitals 16% of reported surgically related deaths occurred and 84% at public hospitals.
- Anaesthetists now participate in TASM and will be included in future reports.

Deaths Audited by TASM

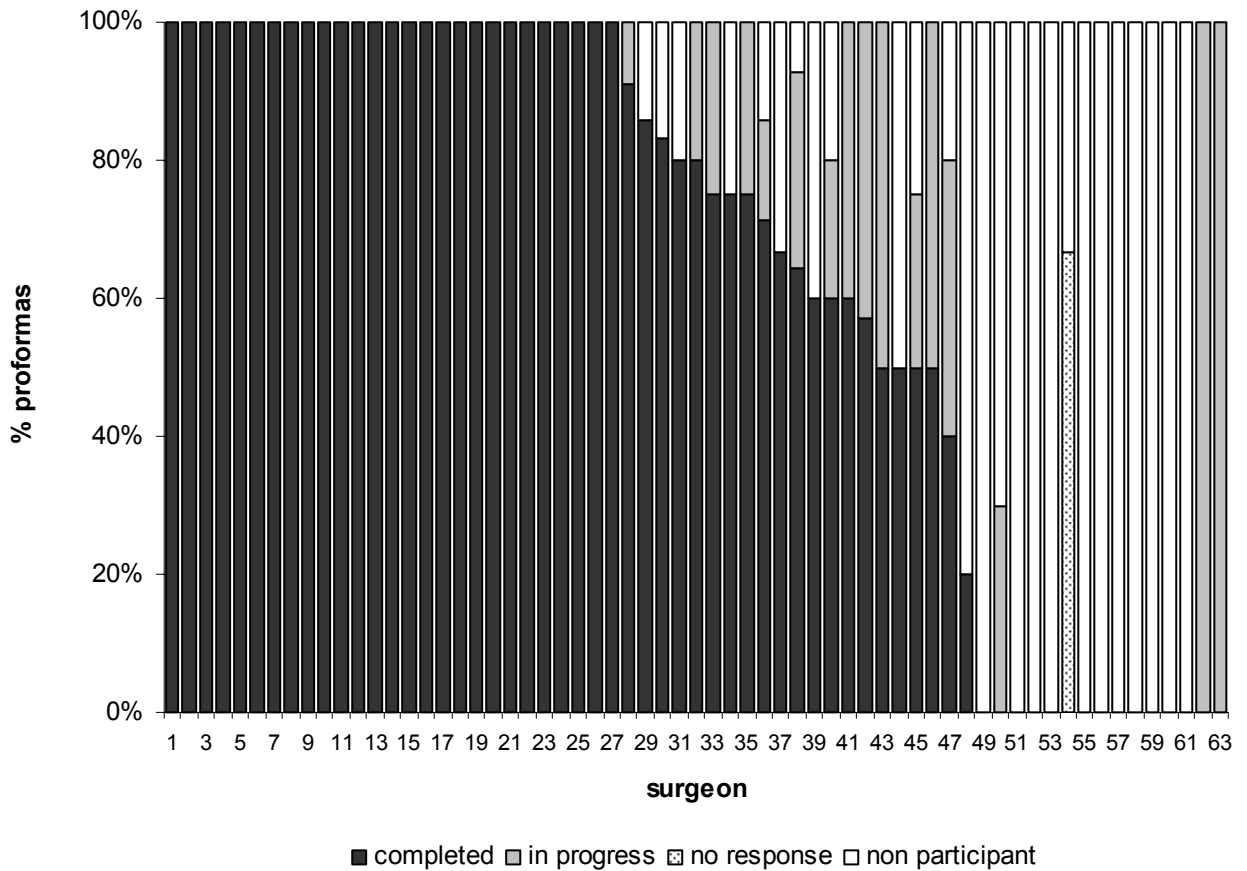
Table 1: Deaths audited by TASM (Sept 2004 to February 2006 n=274)

Proforma	n	%
Completed	181	66%
In progress	32	12%
No response	2	1%
Non participant	59	21%
Total	274	100%

- Participation in the audit is voluntary and surgeons complete and sign a participation form indicating if they wish to participate in the process.
- The audit is a multi-step process (Appendix 1) and there is an associated time lag. The median time to receiving the completed proforma and first line assessment is approximately one month.
- If second line assessment is required, the median time to completion is approximately two months.

Surgeon Participation

Figure 3: Proportion of proformas returned by consultant (n=63)

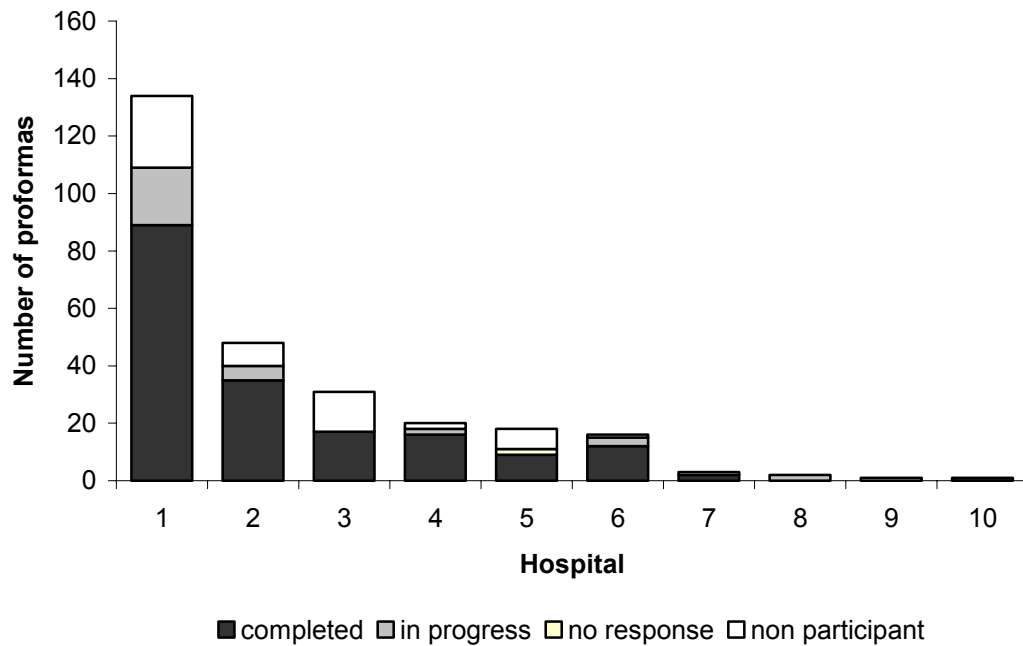


- There were 63 surgeons associated with the 274 deaths reported to TASM from September 2004 to February 2005. (Figure 3).
- At least one proforma was completed by 48/63 (76%) surgeons.
- Overall, 181 (66%) proformas were completed. These deaths were associated with 48 surgeons. (Figure 3).
- At the time of analysis 15 (24%) of these 63 surgeons indicated they did not wish to participate in the TASM. (13 of these surgeons have subsequently joined the audit).

Participation by Hospital

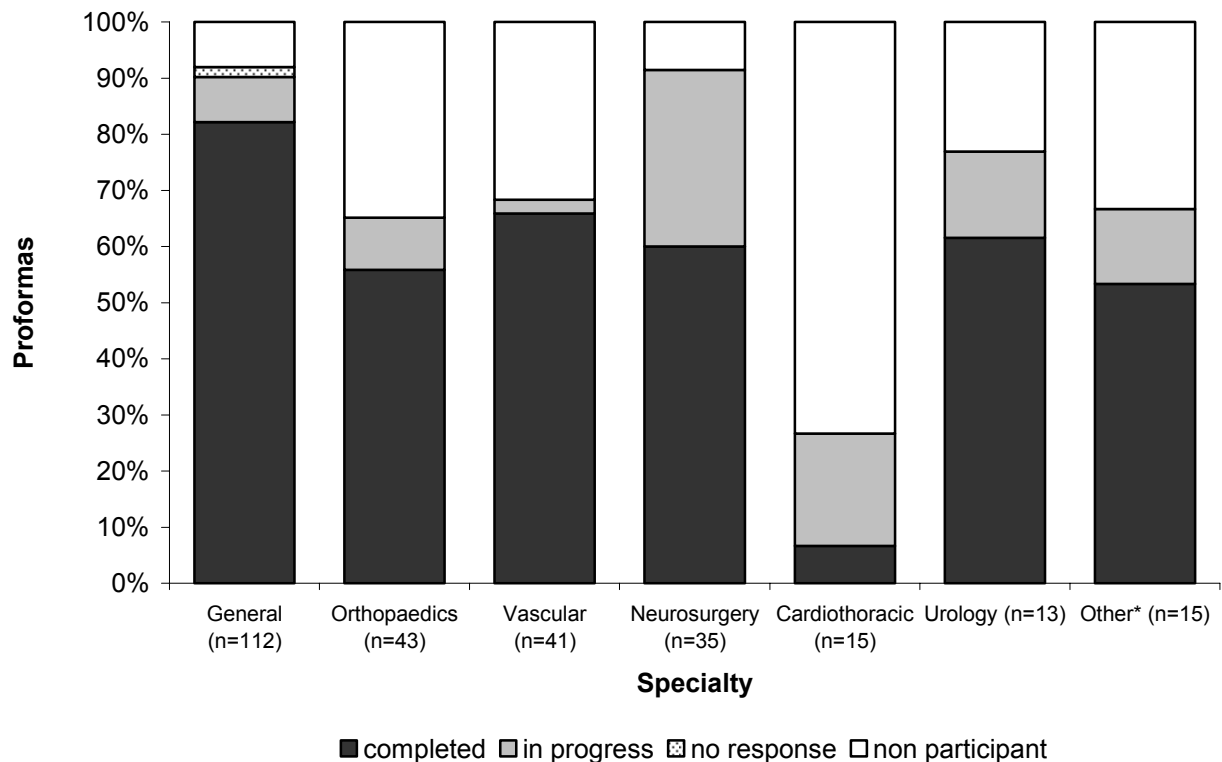
- From September 2004 to February 2006, 274 deaths were reported to TASM from ten hospitals.
- Hospitals in Tasmania range from small district to larger regional hospitals in Launceston, Devonport, Burnie and Hobart. There are large public teaching hospitals in both the north and south of the state.

Figure 4: Number of proformas returned by hospital (n=10)



Participation by Speciality

Figure 5: Proportion of proformas returned by speciality



*Other = ENT, Obstetrics & Gynaecology, Ophthalmology, Plastic, Oral Maxillo-facial

Table 2: Proportion of proformas returned by speciality

Speciality	Proforma status				Total
	Completed	In progress	No response	Non participant	
General	92	9	2	9	112
Orthopaedics	24	4	0	15	43
Vascular	27	1	0	13	41
Neurosurgery	21	11	0	3	35
Cardiothoracic	1	3	0	11	15
Urology	8	2	0	3	13
Other*	8	2	0	5	15
Total	181	32	2	59	274

*Other = ENT, Obstetrics & Gynaecology, Ophthalmology, Plastic, Oral Maxillo-facial

Completed Cases – September 2004 to February 2006

Key Points

- There were 161 completed audited deaths from September 2004 to February 2006
- In this report 143 cases are documented
- The remaining 18 (7%) of cases were terminal care excluded from the audit process.
- Second line review was undertaken in 12 (8%) cases.
- The median age of audited deaths was 77 years.
- One or more significant co-morbidities that contributed towards death was reported in 86% of audited cases.

Patient Sample Demographics

Table 3: Gender distribution

Gender	n (%)	Median age [Interquartile range]
Male	72 (50%)	77 [71 - 83]
Female	71 (50%)	79 [66 – 84]
Total	143 (100%)	77 [71 - 84]

Figure 6: Age distribution of audited deaths by sex (n=143)

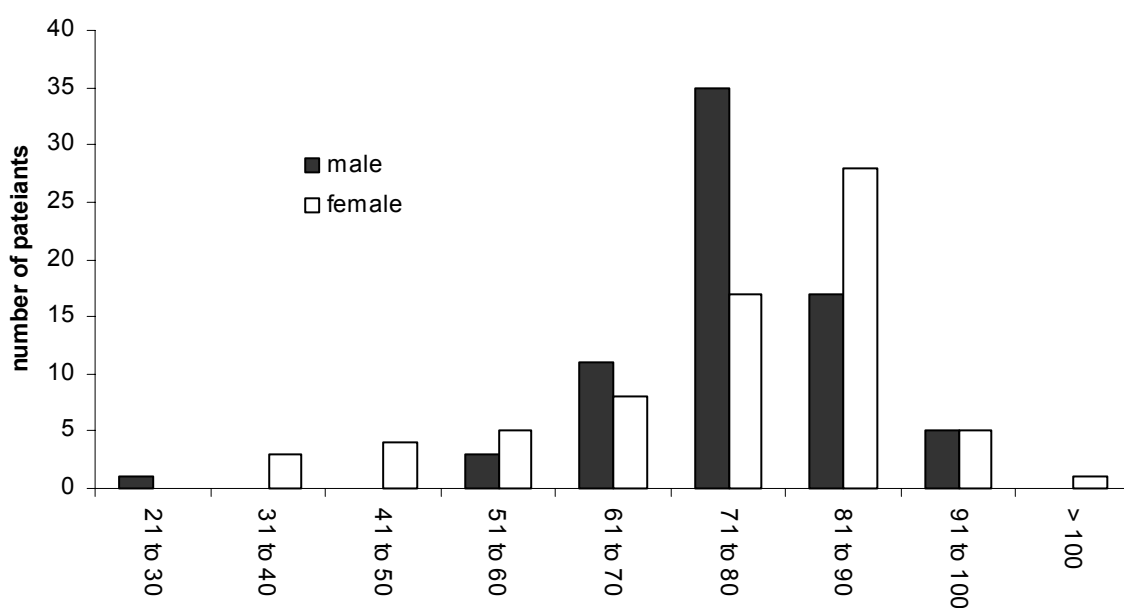
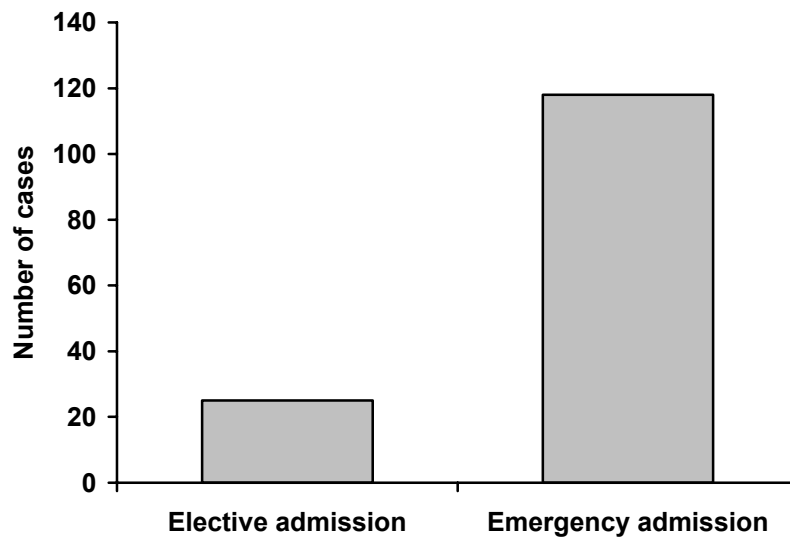


Figure 7: Admission type (Elective/Emergency)



Total admissions (n=143)
 Elective admission – 25 (17%)
 Emergency admission – 118 (83%)

Hospital Status

Table 4: Hospital status (private/public) (n=143)

	n	%
Private	23	16
Public	120	84

Patient Status

Table 5: Patient status (private, public, veteran) (n=143)

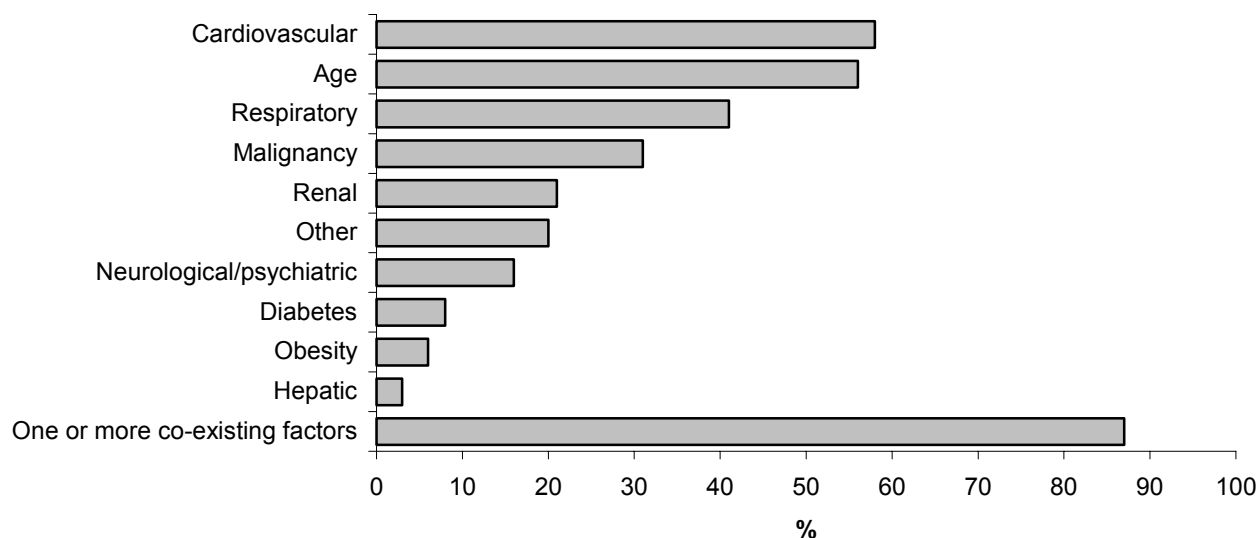
	n	%
Private	23	16
Public	107	75
Veteran	8	6
Missing Info	5	3

Co-morbidity

Surgeons reported

- Malignancy was present in 44 (31%) cases
- Malignancy contributed to death in 31 (22%) cases

Figure 8: Reported co-morbidity in audited cases (n=143)



Other includes alcoholism, GI bleeding, and malnutrition

Grade of Surgeon

Table 6: Grade of surgeon performing first operation – public hospitals (n=78)

	n	%
Consultant	47	60
Advanced Surgical Trainee.	20	26
Service Registrar	2	3
No information	9	11
Total	78	100

Table 7: Grade of surgeon performing first operation – private hospitals (n=23)

	n	%
Consultant	15	65
No information	8	35
Total	23	100

Results

Areas for Consideration, of Concern and Adverse Events

Key points

- In 116 (81%) of audited cases, assessors indicated there were no DoC associated with the patient care.
- Adverse events or areas of concern were found in 11 (8%) cases.
- There were no cases where DoC was reported to have caused death
- The use of HDU or ICU should have been considered in 16 (11%) of cases where HDU or ICU were not used.
- The use of DVT prophylaxis was appropriate in 83% of cases.
- Suboptimal events were considered to be preventable in 14 (54%) audited cases.

Table 8: Numbers of deaths associated with areas for consideration, areas of concern or adverse events as reported by assessors (most significant event only)

	Made no difference to outcome	May have contributed to death	None	Total
Area of Consideration	6	10	2	18
Area of Concern	1	6	0	7
Adverse event	0	4	0	4
None	0	0	114	114
Total	7	20	116	143

Some deaths are associated with more than one event. In the table above, only the most significant event has been ascribed to the case.

Table 9: Preventability of cases associated with suboptimal care

	Preventable?				Total (n)
	Definitely (n)	Probably (n)	Probably not (n)	Definitely not (n)	
Consideration	0	6	8	1	15
Concern	1	5	1	0	7
Adverse event	0	2	2	0	4
Total (n)	1	13	11	1	26

Note: 3 cases where areas for consideration was noted the assessors have not given an opinion as to preventability.

Table 10: Areas of concern or adverse events that assessors thought may have contributed to death (n=10)

Post-operative obstruction after open surgery	1
Small bowel complication of laparoscopic operation	1
Wrong dose of drug used	1
Surgeon “too junior”	1
Poor communication between physician and surgeon	1
Wrong surgical approach used	1
Wrong anaesthetic technique	1
Care unsatisfactory not otherwise specified	1
Post operative care unsatisfactory	1
General complications of treatment	1
Total (n)	10

Elective and Emergency Admissions

Key Points

- An operation was undertaken in 98 (69%) audited cases.
- In 2/25 (8%) of elective admissions and 43/118 (36%) of emergency admissions an operative procedure was not undertaken.
- Elective admissions were associated with a significantly higher proportion of DoC (20%) than emergency admissions (5%).

Table 11: Operative and non-operative care

Admission	Had operation	%	Total
Elective	23	92%	25
Emergency	75	64%	118
Total	98	68%	143

Table 12: Reported Deficiencies of care – elective and emergency audited cases

Elective	Post-operative obstruction after open surgery	1
	Small bowel complication of laparoscopic operation	1
	Surgeon too junior	1
	Poor communication between physician and surgeon	1
	General complications	1
	Total	5
Emergency	Wrong dose of drug used	1
	Delay in diagnosis	1
	Wrong surgical approach used	1
	Wrong anaesthetic technique	1
	Care unsatisfactory not otherwise specified	1
	Post operative care unsatisfactory	1
	Total	6

Table 13: Reported Deficiencies of Care

DoC	Yes	No	Total
Operation performed	10 (10%)	88 (90%)	98
No operation	1 (2%)	44 (98%)	45
Total	11 (7%)	132 (92%)	143

Table 14: Deficiencies of Care associated with emergency and elective admissions

	DoC		Total
	Yes	No	
Elective	5 (20%)	20 (80%)	25
Emergency	6 (5%)	112 (95%)	118
Total	11 (8%)	132 (92%)	143

- More emergency admissions (n=118) than elective admissions (n=25)
- Elective admissions associated with a significantly higher proportion of DoC (20%) than emergency admissions (5%) (Fishers exact test, p=0.024)

Operative and Non-Operative Deaths

Key Points

- Cases where an operation was performed (n = 98) were associated with a higher proportion of DoC (10% v 2%) than cases where no operation was performed (n = 45)
- Surgeons reported in 11 (11%) operative cases the operation was abandoned on finding a terminal situation.

Non-Operative cases

Table 15: Proportion of operative cases by specialty

	Had operation n (%)	No operation n (%)	Specialty Total (n)
General	45 (64)	25 (36)	70
Vascular	16 (67)	8 (33)	24
Orthopaedics	17 (81)	4 (19)	21
Neurosurgery	11 (65)	6 (35)	17
Urology	3 (75)	1 (25)	4
Obs&Gynae	1 (50)	1 (50)	2
ENT	1 (100)	0	1
Ophthalmology	1 (100)	0	1
Plastic	1 (100)	0	1
Cardiothoracic	1 (100)	0	1
Other*	1 (100)	0	1
Total	98 (69)	45 (31)	143

*other = emergency

Figure 9: Reasons for no operation

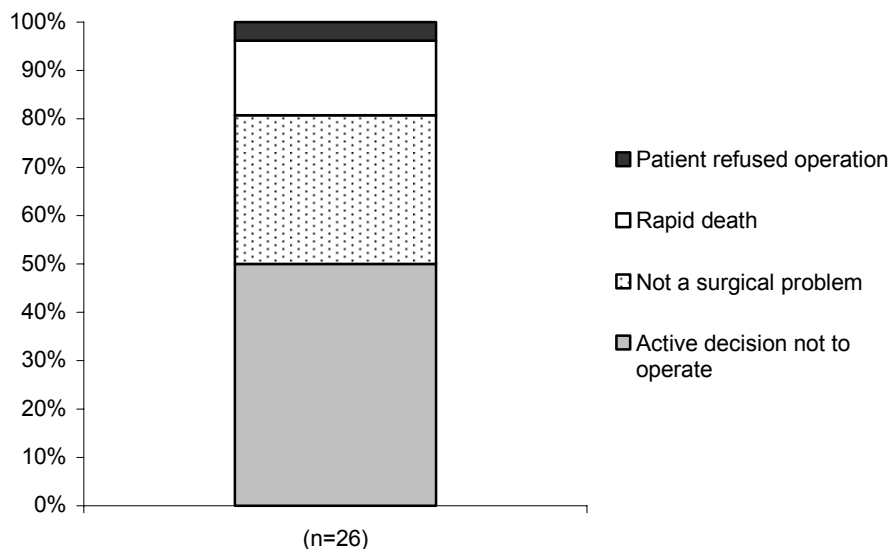


Table 16: Proportion of DoC associated with operative and non-operative cases

DoC	Yes	No	Total (n)
Operation performed	10 (10%)	88 (90%)	98
No operation	1 (2%)	44 (98%)	45
Total	11 (8%)	132 (92%)	143

Operative cases

Table 17: Timing of operation and associated DoC

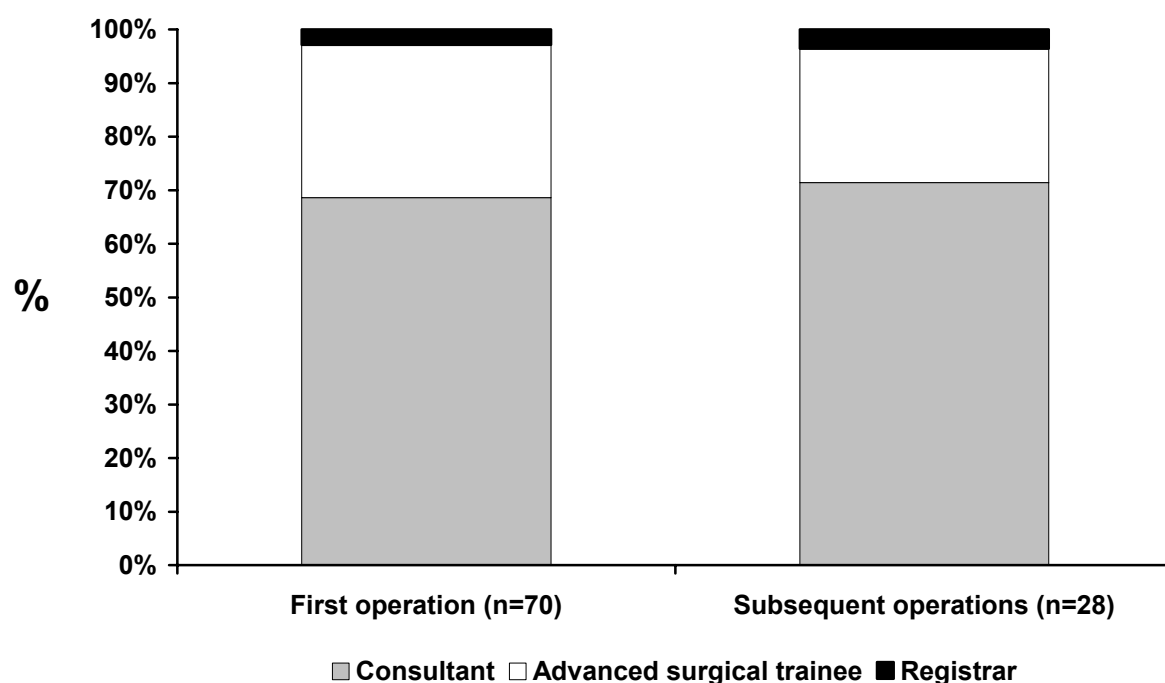
	DoC		Total (n)
	Yes (n)	No (n)	
Elective	3	16	19
Immediate (<2 hrs)	0	5	5
Emergency (<24 hrs)	3	20	23
Scheduled emergency (>24hrs post admission)	1	16	17
Total	7	57	64

Table 18: Number of operations and associated DoC

Number of operations	DoC		Total
	Yes	No	
0	1 (2%)	44	45
1	7 (10%)	61	68
2	3 (14%)	19	22
3	0	8	8
Total	11	132	143

Grade of surgeon – teaching hospitals

Figure 10: Grade of surgeon performing first and subsequent operations (teaching hospitals)



Prophylaxis and Thromboembolism

- Surgeons indicate on the surgical proforma whether DVT prophylaxis was used, and if not, the reasons why it was withheld.
- At case review, assessors indicate whether they thought that the decision on the use of DVT prophylaxis was appropriate.
- The proportion of patients who received DVT prophylaxis was 60%
- In the assessor’s opinion the use of DVT prophylaxis was appropriate in 83% of cases.

Use of ICU and HDU

Table 19: Use of ICU and HDU (Assessor's response) (total n=143)

	n (%)
ICU used	55 (38)
HDU used	12 (8)
ICU should have been used	6 (4)
HDU should have been used	10 (7)

Post-Mortems

- A post- mortem examination was conducted in 25 cases.
- Five surgeons had read the post-mortem report
- Of the five surgeons that read the report, one indicated it added additional information
- In 11 cases surgeons reported that they would have preferred a post-mortem where none had been done.

Table 20: Post-mortems conducted (n=143)

	n (%)
Hospital post-mortem	5 (3)
Coronial post-mortem	20 (14)
No post-mortem conducted	90 (63)
Post- mortem refused	4 (3)
Consultant did not know if post-mortem conducted	20 (14)
Missing information	4 (3)

Acknowledgements

TASM acknowledges the help and support of the many people and institutions which assist in the continuation and development of this project including:

- Participating surgeons.
- First-line assessors and, in particular, the second-line assessors for their (unpaid) time and effort in providing detailed second line case note reviews.
- WAASM for support and assistance.
- SASM for their ongoing support.
- The DHHS for their commitment to TASM and funding.
- RACS, including the Research and Audit Division
- Medical records departments and their staff in all participating hospitals.

RACS TASM Management Committee Membership

Mr Rob Bohmer <u>Chairman</u>	MBCChB, FRACS - <i>General Surgeon</i>
Mr Robert Linacre Vice Chairman	FRCS(Ed), FRACS - <i>General Surgeon.</i>
Professor Peter Stanton	BMedSci(Hons), MBBS(Hons), PhD(Glas) FRCPSG, FRACS <i>Head of Discipline, School of Medicine, University of Tasmania</i>
Mr Carl Castellino	BSc, MB, FRACS. - <i>Surgical Specialist</i>
Mr Stephen Brough	MBCChB, MSc, FRCS(Urol.), FRACS. - <i>Consultant Urologist</i>
Dr Margaret Walker	MBBS (Hons), F.A.N.Z.C.A. - <i>Anaesthetist</i>
Ms Janie Dickenson	BFA - <i>Alderman</i>
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Ms Lisa Lynch	RN - <i>Project Coordinator, TASM</i>

TASM Staff

Ms Lisa Lynch	RN - <i>Project Coordinator, TASM</i>
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APPENDIX 1 TASM Methodology

