Royal Australasian College of Surgeons

Tasmanian Audit of Surgical Mortality

Annual Report 2020

Royal Australasian College of Surgeons
Australian and New Zealand Audits of Surgical Mortality

Tasmanian Government

UTAS
FACULTY OF HEALTH SCIENCE
School of Medicine

The Royal Australian and New Zealand College of Obstetricians and Gynaecologists
Excellence in Women's Health

CONTACT DETAILS

Tasmanian Audit of Surgical Mortality (TASM)

Royal Australasian College of Surgeons

Suite 1

105 Macquarie Street

Hobart TAS 7000

Web:	www.surgeons.org/TASM
Email:	tasm@surgeons.org
Telephone:	+61 3 6223 8848
Facsimile:	+61 3 6223 5019

Image on the front cover: MAD.vertise / Shutterstock.

The information contained in this annual report has been prepared by the Royal Australasian College of Surgeons, Tasmanian Audit of Surgical Mortality Management Committee.

Contents

List of figures and tables

Foreword from TASM

This report covers the financial year 2019–2020, when the coronavirus was essentially unknown, certainly in Australia, and had not developed into the current international coronavirus (COVID-19) pandemic. Since then, the impact of the COVID-19 pandemic on medical care in Australia has been profound, not least the curtailment of elective surgery. The Australian and New Zealand Audit of Surgical Mortality (ANZASM) has maintained a close watch on the impact of COVID-19, and this will doubtless be an important part of future reports. At the time of writing (December 2021), ANZASM has not identified an increase in deaths, although one international report noted an increased mortality in patients who had a previous or current COVID-19 infection. The early very low COVID-19 infection rate in Australia may make it difficult for ANZASM to authoritatively address COVID-19–related surgical mortality. Overall, there may even be fewer surgery-related deaths. For example, there have been fewer car accidents and other traumas. Attendance at emergency departments has fallen. Many emergencies are time critical and with minimal elective surgery, timely theatre access is more likely to be achieved, which may improve outcomes. Conversely, there is a strong suggestion that COVID-19 infection may have adverse long-term health implications and, if this is correct, elective surgery in previously infected patients may carry increased risk.

The COVID-19 pandemic became fully established during 2020. During this period, Australia had to prepare for the unknown on the basis of a worst-case scenario. As it happened, the impact of COVID-19 in Australian healthcare, and in particular Tasmania, was minimal compared with most other countries.

That stated, caution is required as it may be several years before the full surgical impact of COVID-19 is understood. There is now clear evidence that up to 15 per cent of those infected develop so-called ‘long COVID’; this includes the young and those who had a minor initial infection. The long-term implications of long COVID are unknown, and it remains to be determined whether the risks of surgery in previously infected patients, even if minor, are greater than those with no history of COVID-19. At present, the data suggests long COVID is rare in those who develop breakthrough infection (that is, contract COVID despite being vaccinated). The only way to reduce the potential surgical burden of long COVID is to rapidly achieve a fully vaccinated population.

Mr Rob Bohmer

Clinical Director Tasmanian Audit of Surgical Mortality

1 Abbreviations

ANZASM	Australian and New Zealand Audit of Surgical Mortality
ANZCA	Australian and New Zealand College of Anaesthetists
AOA	Australian Orthopaedic Association
ASA	American Society of Anaesthesiologists
CCU	critical care unit/critical care utilisation
CHASM	Collaborating Hospitals' Audit of Surgical Mortality
CMI	clinical management issue
COPMM	Council of Obstetric and Paediatric Mortality and Morbidity
CPD	continuing professional development
DVT	deep vein thrombosis
FLA	first-line assessment
IQR	interquartile range
NSQHS	National Safety and Quality Health Service
PE	pulmonary embolism
RACS	Royal Australasian College of Surgeons
RANZCOG	Royal Australian and New Zealand College of Obstetricians and Gynaecologists
SCF	surgical case form
SLA	second-line assessment
TASM	Tasmanian Audit of Surgical Mortality

2 Executive summary

The audit was mandated by the Royal Australasian College of Surgeons (RACS) in 2010 as part of the continuing professional development (CPD) program. Compliance with the audit is determined by the number of cases that have completed the audit process compared with the total number of surgical deaths in the audit period. Key findings in this report are based on 95 peer-reviewed cases from the audit period of **1 July 2019 to 30 June 2020**.

2.1 Hospital admission and operative patient profile

The most frequent operative procedures described for the Tasmanian Audit of Surgical Mortality (TASM) during the audit period (2019–2020), were for General Surgery (including trauma and colorectal subspecialties). During the current audit period (2019–2020), most patients (76.8%; 73/95) had at least one operation during their final hospital admission. Of the patients who had surgery, 16.4**%** (12/73) had an unplanned return to the operating theatre due to complications. A consultant was present in theatre in 72.7% (72/99) of operations compared to the national rate of 78.2**%** (2,593/3,316). The presence of a consultant is appropriate due to the more challenging nature of emergency cases with greater risks.

2.2 Clinical management issues

Clinical management issues (CMIs) identified in this audit show that more than one issue can occur during a patient's hospital stay (Section 13.3).

There were no criticisms of patient management in 78.9**%** (75/95) of audited cases, whereas the peer-review process found faults in the management of the remaining 21.1**%**. In 9.5**%** (9/95), the criticisms were mild and considered to be differences of opinion (areas of consideration). In 7.4**%** (7/95) of cases the assessments were more severe (classified as areas for concern), and in 4.2**%** (4/95) of cases the peer-review process concluded that adverse events had occurred.

Individual criticisms of CMIs for each case have been directed to the treating surgeons to allow feedback and reflection. It is important to note that not all CMIs are associated with the surgical team.

2.3 Potentially preventable clinical outcomes

In addition to identifying CMIs, clinical assessors also decide whether those issues were potentially preventable. The rate of preventability of adverse events or concerns has decreased from 16.8% (17/101) in 2018–2019 to 10.5% (10/95) in the current audit period (Section 13.3, Table 6). TASM distributes clinical performance reports to each participating site, allowing for healthcare services to examine their own de-identified potentially preventable outcomes.[1]

The key TASM recommendations in this report reflect 6 of the 8 National Safety and Quality Health Service (NSQHS) Standards[2] that can be used by hospitals and health professionals to improve clinical practice and patient safety. Overall, the goal is for the information that TASM collects to help all surgical Fellows and participating health organisations improve the quality of their services and safeguard high standards of care.

3 Introduction

The Tasmanian Audit of Surgical Mortality (TASM) forms part of the Australian and New Zealand Audit of Surgical Mortality (ANZASM) – a national network of regional audits of surgical deaths that aim to ensure the highest standards of safe and comprehensive surgical care. TASM, like its national counterparts, monitors trends in surgical deaths via independent peer-review assessments. These assessments identify clinical management issues (CMIs) for which strategies can be developed to manage and improve patient safety.

This report presents key findings and recommendations for the period 1 July 2019 to 30 June 2020, with tables and figures providing information from 1 July 2012 to 30 June 2020 to illustrate changes over time. If data have not been provided to the TASM office, the case is excluded from analysis for the relevant section only. For this reason, the denominator varies for different results.

To further assess emerging trends, and to benchmark outcomes of surgical care, case comparisons have been made between TASM and ANZASM. The Collaborating Hospitals' Audit of Surgical Mortality (CHASM) in New South Wales runs a comparable audit methodology and collects similar data to ANZASM. CHASM is independently managed by the Clinical Excellence Commission of New South Wales and the data are inaccessible to TASM, thus ANZASM national data aggregate comparisons include all state and territory audit outcomes except for New South Wales.

TASM Management Committee would like to acknowledge the support and assistance of the many individuals and institutions that have helped in the development and continual improvement of this project.

4 Rapid statistics

Tasmania has a reliable and safe healthcare system

TASM works to ensure that a high standard of surgical care is maintained in Tasmania and that patients receive the best care possible. The data below presents audited cases from 1 July 2019 to 30 June 2020.

Demographics

Population	541,000
Males	53.7%
Females	46.3%
Median age	75

Admission status

Elective	13.7%
Emergency	86.3%

Transfer

Patient transfer	19.0%

Risk

Preoperative risk of death

Expected	4.1%
Considerable	61.6%
Moderate	23.3%
Small	8.2%
Minimal	2.7%

Most common comorbidities

Age	22.8%
Cardiovascular	20.7%
Respiratory	11.2%
Other	9.5%
Renal	8.7%

Most common causes of death

Multi-organ failure	13.3%	Gastrointestinal haemorrhage	3.9%
Septicaemia	10.9%	Respiratory failure	3.9%
Brain death	5.5%	Other aspiration pneumonia as a complication of care	3.9%

Key Findings

Overview

Decreased mortality	Decreased adverse events
Decreased clinically significant infection	Improved patient care
Improved fluid balance management	Improved DVT prophylaxis utilisation

Peer-review outcomes

Adverse event	4.3%	Area for consideration	9.6%
Area of concern	7.4%	No issues	78.7%

5 National Safety and Quality Health Service Standards

This report can assist hospitals with accreditation for the following National Safety and Quality Health Service (NSQHS) Standards[2] highlighted in the Key Recommendations and the Clinical Risk Management sections.

Figure 1: National Safety and Quality Health Service Standards associated with TASM

National Safety and Quality Health Service Standards		TASM Key Recommendations
Standard 1 Clinical Governance		- To improve leadership in patient care
Standard 2 Partnering with Consumers		- To assess whether the decision to operate is appropriate - To consider quality of life and end-of-life care
Standard 3 Preventing and Controlling Infections		- To control and manage infections with appropriate investigation, rapid administration of treatment and timely involvement of expert teams
Standard 5 Comprehensive Care		- To improve perioperative management - To improve awareness of surgical emergencies and shared care - To involve patients in planning their treatment - To reduce falls in hospitals and residential care
Standard 6 Communicating for Safety		- To improve documentation of care plans and clinical events - To improve communication among health professionals and their patients
Standard 8 Recognising and Responding to Acute Deterioration		- To act on evidence of clinical deterioration

The standards listed above have been selected based on shared learning from different specialty-based cases from the audit. Case studies are routinely provided to the hospitals and health professionals and can be used to address areas of clinical practice and patient safety needing improvement. The case studies are featured in Case Note Review Booklets and Cases of the Month.[3]

6 Audit numbers

The TASM audit process depends upon receiving notifications of deaths from participating hospitals. Each hospital prepares and submits a list of deaths that have occurred when a patient was under the care of a surgeon. Thus, the discharging unit would usually be recorded as surgical; however, in some instances a patient who has received surgical care may not be under the care of a surgeon at the time of death.

TASM aims to have all mortality cases reviewed within 2 months of notification. For the audit period 1 July 2012 to 30 June 2020, TASM received 1,071 notifications of deaths associated with surgical care. Cases recorded as admissions for terminal care (14.9%; 160/1,071) were excluded from the review process. There were 13 terminal-care cases in the current audit period 1 July 2019 to 30 June 2020.

Table 1: Trend of mortalities identified by TASM, 2012–2020

Audit period	Total cases	Closed	Terminal care
2012–2013	135	121	14
2013–2014	139	118	21
2014–2015	147	133	14
2015–2016	162	140	22
2016–2017	113	94	19
2017–2018	134	108	26
2018–2019	133	102	31
2019–2020	108	95	13
Total	**1,071**	**911**	**160**

Abbreviations
TASM = Tasmanian Audit of Surgical Mortality.

7 Audit compliance

All hospitals providing surgical services are expected to participate with the audit requirements. Regular reporting of mortalities from hospitals launches the audit process but to comply with this, Royal Australasian College of Surgeons (RACS) Fellows must agree to participate and must return completed surgical case forms (SCF) and assessment forms in a timely and accurate manner. Thus, there is a difference between surgeon participation and compliance. Surgeons in Tasmania completed the SCFs in 100.0**%** (108/108) of the notified deaths in 2019–2020.

Each step of the audit process – submission of the SCF, the first-line assessment (FLA) and second-line assessment (SLA) – should be completed within 21 days. Obtaining medical records and other documentation (for SLA) can take up to 1 months for complex cases.

Board members of Royal Australian and New Zealand College of Obstetricians and Gynaecologists (RANZCOG), Australian Orthopaedic Association (AOA) and Australian and New Zealand College of Anaesthetists (ANZCA) have approved formal collaboration with ANZASM in the audit process, ensuring that a greater number of surgery-related cases are captured. The Council of Obstetric and Paediatric Mortality and Morbidity (COPMM) continues to separately review obstetric and neonatal deaths.

This report focuses on the clinical outcomes of the 95 closed cases that completed the audit process in the reporting period 1 July 2019 to 30 June 2020 and compares these outcomes to previous years.

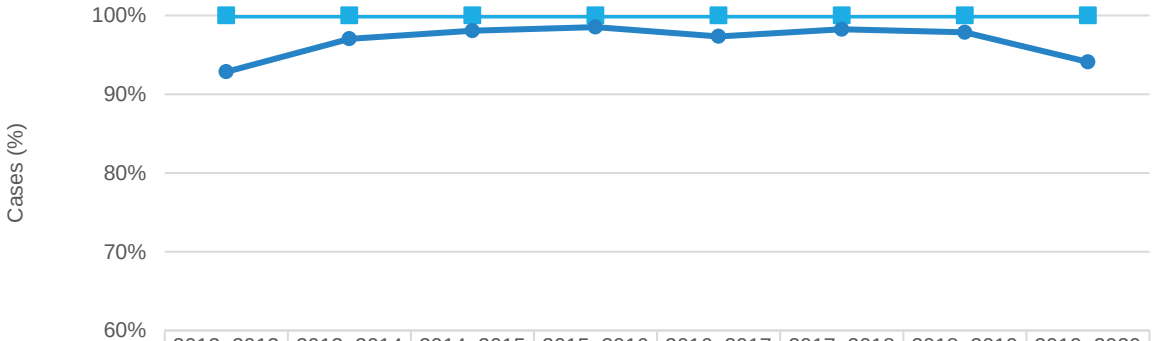
Of the reported mortalities in the current audit year, 12.0% (13/108) were excluded from further analysis due to terminal-care admissions.

The specialties with the most notifications in 2019–2020 were:

- 41.7%, General Surgery, including trauma and colorectal subspecialties
- 23.1%, Neurosurgery
- 15.8%, Orthopaedic Surgery
- 10.2%, Cardiothoracic Surgery
- 4.6%, Vascular Surgery
- 3.7%, Urology
- 0.9%, Gynaecology.

Figure 2 illustrates changes in the SCF return rate for surgeons in Tasmania compared to surgeons nationally for the period 2012–2020. The Tasmanian rate for completed SCFs for this period is 100.0% (1,071/1,071), which is higher than the national average of 96.8% (32,751/33,829).

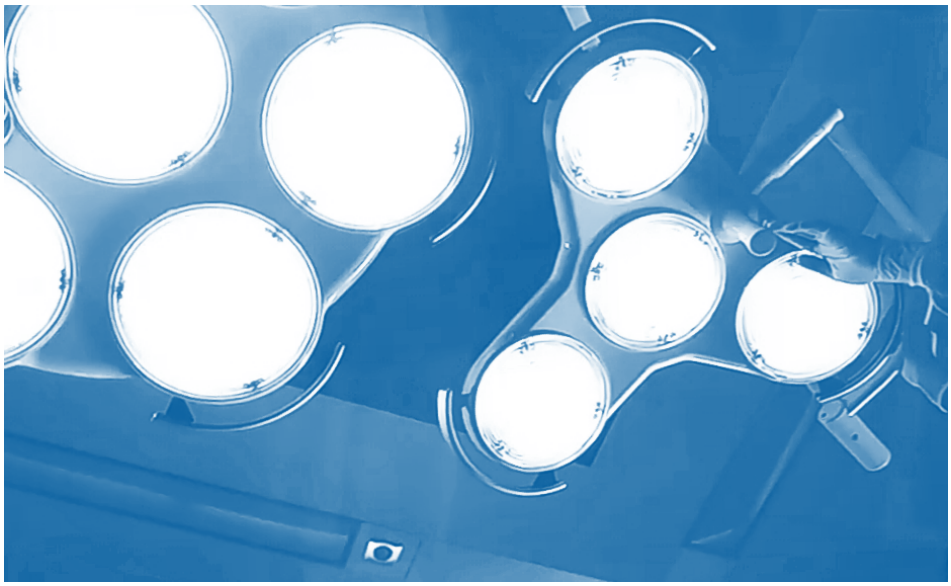
Figure 2: Compliance by return rate of SCF to TASM compared to national data, 2012–2020



	2012–2013	2013–2014	2014–2015	2015–2016	2016–2017	2017–2018	2018–2019	2019–2020
TASM	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
National	92.8%	97.0%	98.1%	98.5%	97.3%	98.2%	97.9%	94.1%

Audit year

Abbreviations
SCF = surgical case form, **TASM** = Tasmanian Audit of Surgical Mortality.
Notes
n=1,071 SCFs returned out of 1,071 reported cases in Tasmania from 1 July 2012 to 30 June 2020.
n=32,751 SCFs returned out of 33,829 reported cases reported nationally from 1 July 2012 to 30 June 2020.
Tasmanian data was excluded from the national data pool for the comparison.



8 Characteristics of audited deaths

Table 2 shows that the demographic data for Tasmania was similar to the national data during the audit period. The risk of death classified as 'considerable' or 'expected' prior to surgery remains high at 65.7% (48/73) in Tasmania and 60.5% (1,464/2,422) nationally.

Table 2: Characteristics of audited deaths in Tasmania compared to national data, 2019–2020

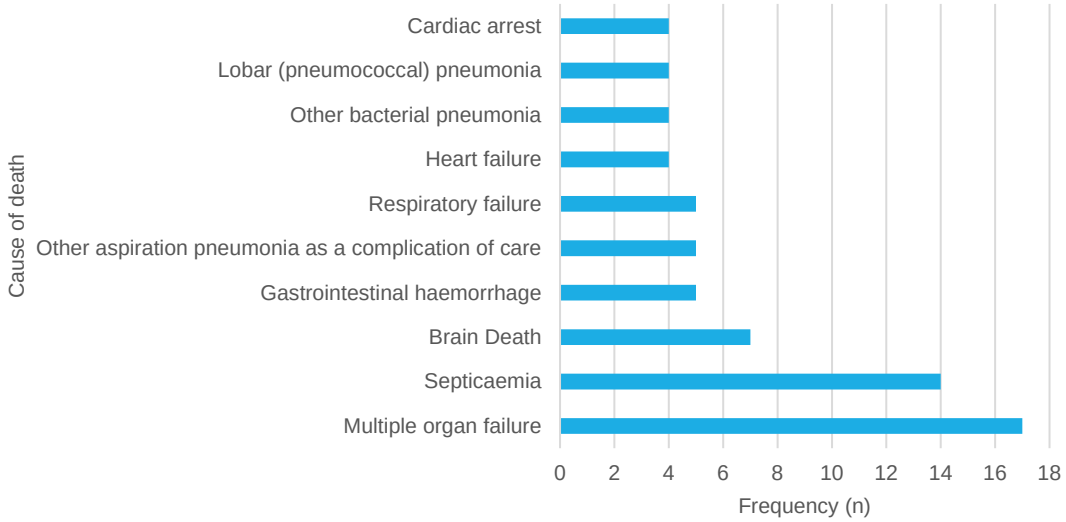
		TASM	National
Number of audited deaths		n=95	n=2,974
Median age of patient in years (IQR)		75 (65–84)	76 (64–85)
Operative cases (%)		76.8	82.0
Sex (%)	Male	53.7	59.6
	Female	46.3	40.4
Admission status (%)	Elective	13.7	14.6
	Emergency	86.3	85.4
ASA grades (%)	ASA 1–2	11.8	5.5
	ASA 3	22.6	28.2
	ASA 4	46.2	50.0
	ASA 5–6	19.4	16.3
Risk of death prior to surgery (%)	Expected	4.1	10.0
	Considerable	61.6	50.5
	Moderate	23.3	25.7
	Small	8.2	9.5
	Minimal	2.7	4.3
Most common comorbid factors (%)	Age	22.8	19.8
	Cardiovascular	20.7	21.3
	Respiratory	11.2	11.3
	Other	9.5	8.0
	Renal	8.7	10.3
	Neurological	7.9	7.7
	Advanced malignancy	6.2	7.2
	Diabetes	5.8	7.5
	Obesity	5.8	4.0
	Hepatic	1.2	3.0
Number of operative procedures performed (%)	3 or more	5.3	6.4
	2	10.5	10.7
	1	61.1	61.1
	0	23.2	18.1

Abbreviations
ASA = American Society of Anesthesiologists, **IQR** = interquartile range, **TASM** = Tasmanian Audit of Surgical Mortality.
Notes
The American Society of Anesthesiologists (ASA) Physical Status Classification System grade is an international measure of patient's physiological reserve, used by anaesthetists.[4]
Comorbidities describe coexisting medical conditions or disease processes additional to the primary diagnosis.
Each audited case can have more than one operation.
Tasmanian data was excluded from the national data pool for the comparison.

9 Establishing the cause of death

Cause of death as recorded by the treating surgeon is based on the clinical course of the patient and any relevant supporting evidence acquired from investigations. A patient can have multiple causes of death associated with their final demise. From 1 July 2019 to 30 June 2020, there were 128 conditions perceived to have caused death across 95 cases.

Figure 3: Top 10 TASM causes of death, 2019–2020



Abbreviations
TASM = Tasmanian Audit of Surgical Mortality.
Notes
n=128 causes of death associated with 95 Tasmanian patients from 1 July 2019 to 30 June 2020.
Top 10 causes account for 53.9% (69/128) of causes of death.

Where doubt exists around the circumstances leading to death, the case is referred to the coroner. Coronial investigations and TASM peer-review assessment have different purposes. Both data sources add value to quality assurance activities to improve surgical care, but to avoid erroneous interpretations they should be considered complementary rather than parallel assessment tools.

In the current audit period (2019–2020), 13.7% (13/95) of TASM cases received a coronial postmortem, compared with a national average rate of 12.6% (368/2,928). During the full audit period (2012–2020), the postmortem rate distributes into 23.4% (32/137) of elective cases and 12.8% (99/771) of emergency cases.

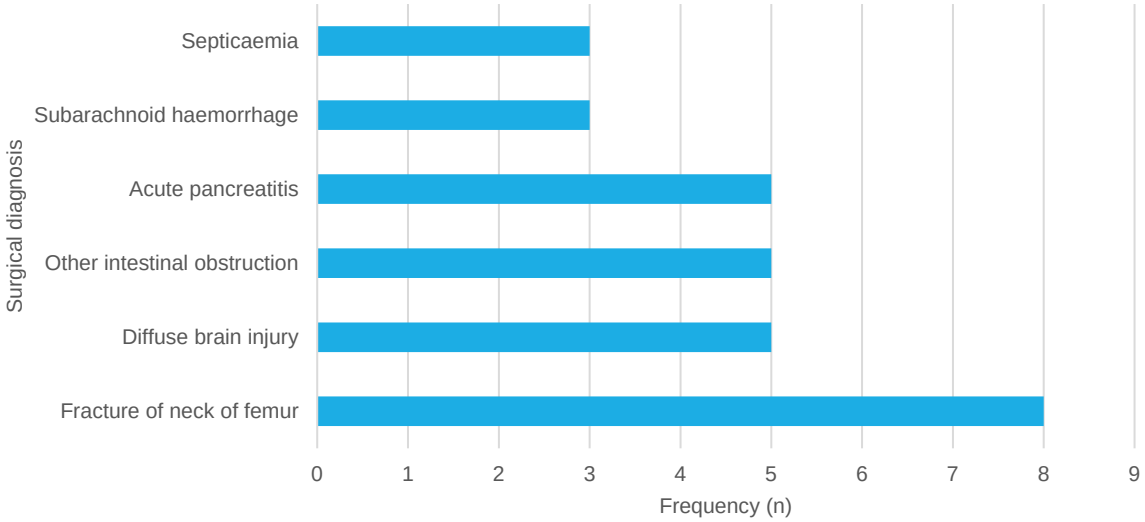
An Australian study examining clinicians' understanding of deaths reportable to the Victorian coroner highlights that postmortems provide valuable educational information and provide insights for CMIs.[5] The continuing low rates of referral for postmortem are of concern.

10 Clinical risk management

10.1 Establishing the surgical diagnosis

Establishing a surgical diagnosis after review of test results, operations and any postmortems can indicate a patient's condition prior to surgery. Patients can have multiple surgical diagnosis codes associated with their death. The surgical diagnoses have been consistent over the years.

Figure 4: Top 6 TASM surgical diagnoses, 2019–2020



Abbreviations
TASM = Tasmanian Audit of Surgical Mortality.
Notes
n=113 surgical diagnoses associated with 95 patients from 1 July 2019 to 30 June 2020.
Top 6 diagnoses account for 19.4% (216/1,115) of the total surgical diagnoses.

In the current audit period, the proportion of cases with malignancies identified as part of comorbidities was 15.8% (15/95), which is slightly higher than the previous audit year (2018–2019) at 14.7% (15/102).

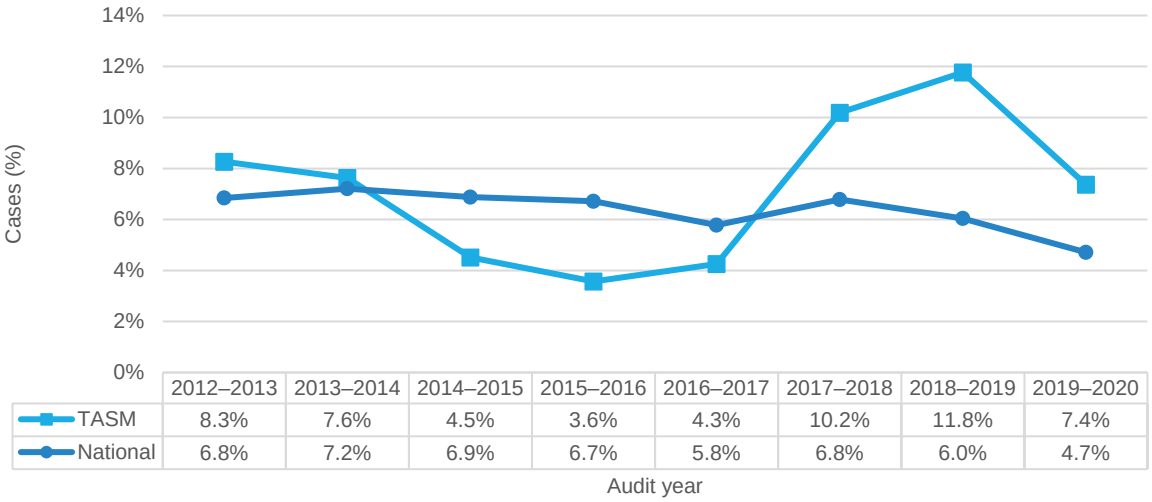
10.2 Delay in surgical diagnosis

Early diagnosis is critical in preventing surgical complications or deterioration, particularly in a frail population. Delays in treatment are known to increase the risk of death.[6] Treating surgeons are asked to reflect and then record any perceived delays in establishing a diagnosis and proceeding to definitive treatment.

For the current audit period, the rate of delays in establishing a diagnosis was 7.4% (7/95). In the previous audit period (2018–2019), Tasmanian surgeons reported delays in diagnosis in 11.8% (12/102) of operative cases in which the patient underwent at least one operation. For the total period 2012 to 2020, diagnostic delays were identified by the treating surgeons in 7.0% (64/911) of audited deaths in Tasmania, comparable to the national finding of 6.4% (1,723/26,957).

It is important to note that delays are not always attributable to the surgical team. Examples of these delays include late referral to specialist and the patient presenting late.

Figure 5: Deaths with delay in surgical diagnosis compared to national data, 2012–2020



	2012–2013	2013–2014	2014–2015	2015–2016	2016–2017	2017–2018	2018–2019	2019–2020
TASM	8.3%	7.6%	4.5%	3.6%	4.3%	10.2%	11.8%	7.4%
National	6.8%	7.2%	6.9%	6.7%	5.8%	6.8%	6.0%	4.7%

Audit year

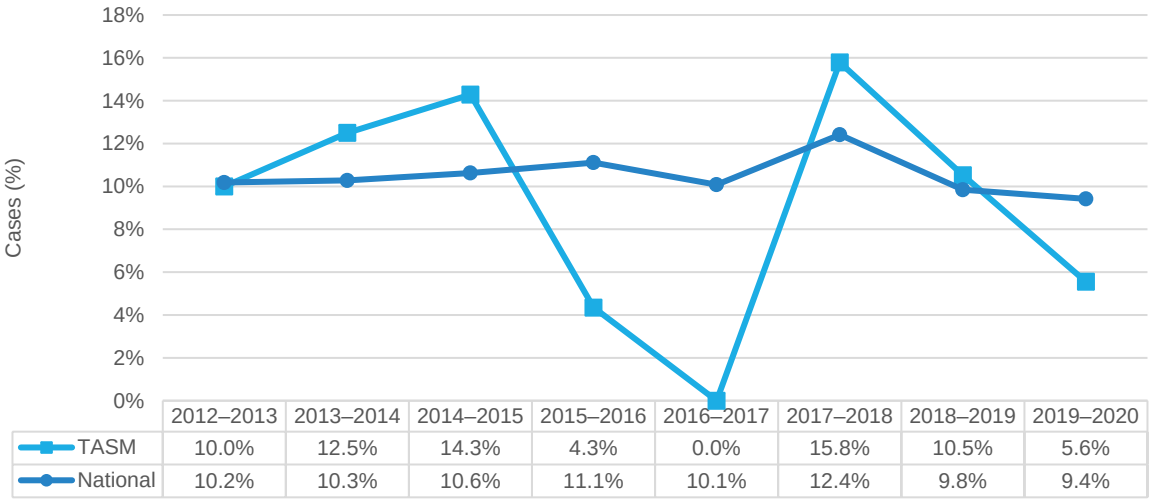
Abbreviations
TASM = Tasmanian Audit of Surgical Mortality.
Notes
n=64 out of 911 Tasmanian patients with delays in surgical diagnosis from 1 July 2012 to 30 June 2020.
n=1,723 cases out of 26,957 national patients with delays in surgical diagnosis from 1 July 2012 to 30 June 2020. Data not available: n=282.
Tasmanian data was excluded from the national data pool for the comparison.

10.3 Delay in transfer to a hospital

Delays and problems in transfer can cause risks and challenges for shared surgical care. In the current audit period, a small proportion of patients requiring preoperative transfer to another hospital experienced delays, inappropriate transfer or inappropriate care. In 2019–2020, 18 patients were transferred between hospitals and 5.6% (1/18) of them were reported to have had delays in the transfer (Figure 6).

In the current audit period, Tasmania appears to have had slightly fewer pre-treatment transfer delays (5.6%; 1/18) compared to the national findings (9.4%; 68/722).

Figure 6: Deaths with delay in hospital transfer compared to national data, 2012–2020



	2012–2013	2013–2014	2014–2015	2015–2016	2016–2017	2017–2018	2018–2019	2019–2020
TASM	10.0%	12.5%	14.3%	4.3%	0.0%	15.8%	10.5%	5.6%
National	10.2%	10.3%	10.6%	11.1%	10.1%	12.4%	9.8%	9.4%

Audit year

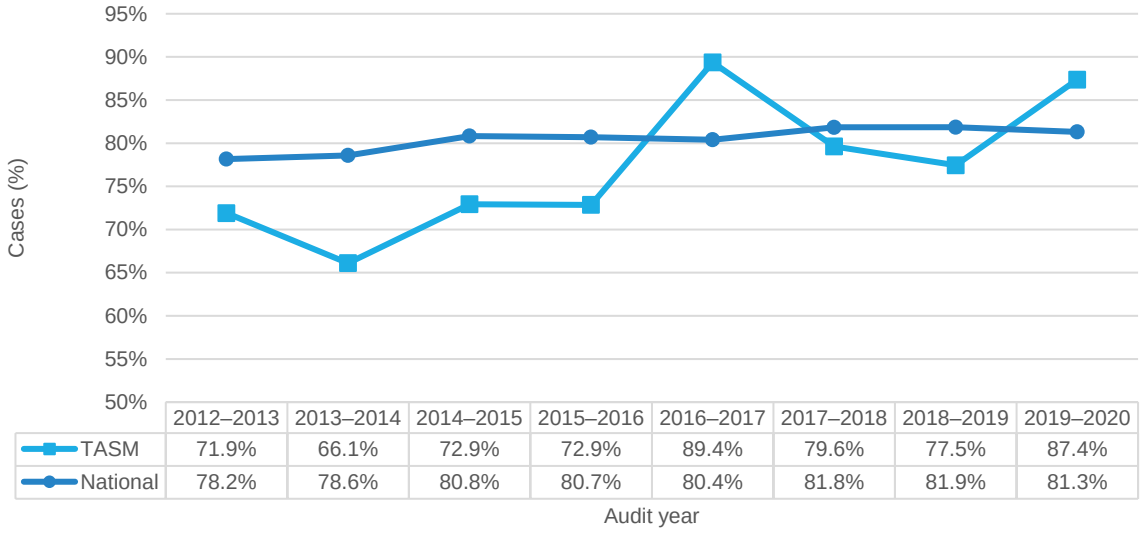
Abbreviations
TASM = Tasmanian Audit of Surgical Mortality.
Notes
n=14 out of 146 Tasmanian patients with delays in transfer from 1 July 2012 to 30 June 2020. Data not available: n=2.
n=683 out of 6,487 national patients with delays in transfer from 1 July 2012 to 30 June 2020. Data not available: n=461.
Tasmanian data was excluded from the national data pool for the comparison.

10.4 Deep vein thrombosis prophylaxis

Pulmonary embolism (PE) remains a major cause of death in hospital patients across Australia despite the availability of effective pharmacological and mechanical deep vein thrombosis (DVT) prophylaxis options. The appropriate use of DVT prophylaxis is outlined in the Clinical Practice Guideline for the Prevention of Venous Thromboembolism in Patients Admitted to Australian Hospitals[7].

In Tasmania, there was an increase in the use of DVT prophylaxis from 77.5% (79/102) in 2018–2019 to 87.4% (83/95) in 2019–2020.

Figure 7: DVT prophylaxis use compared to national data, 2012–2020



	2012–2013	2013–2014	2014–2015	2015–2016	2016–2017	2017–2018	2018–2019	2019–2020
TASM	71.9%	66.1%	72.9%	72.9%	89.4%	79.6%	77.5%	87.4%
National	78.2%	78.6%	80.8%	80.7%	80.4%	81.8%	81.9%	81.3%

Abbreviations
DVT = deep vein thrombosis, **TASM** = Tasmanian Audit of Surgical Mortality.
Notes
n=696 out of 911 Tasmanian patients had DVT prophylaxis from 1 July 2012 to 30 June 2020.
n=21,468 out of 26,666 national patients had DVT prophylaxis from 1 July 2012 to 30 June 2020. Data not available: n=573.
Tasmanian data was excluded from the national data pool for the comparison.

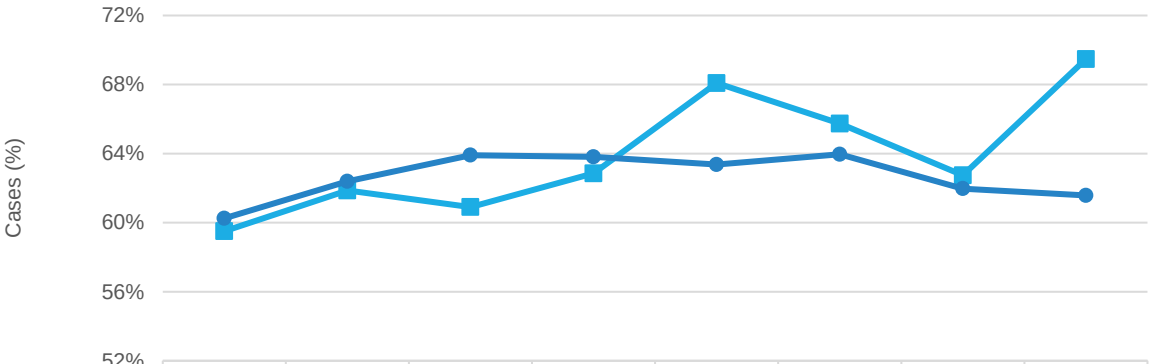
The choice of prophylaxis is subject to the judgement of clinicians caring for individual patients and has increased from previous reports.

10.5 Adequacy of provision of critical care support to patients

Treating surgeons were asked to record whether their patients received critical care support before or after surgery. First-line and second-line assessors reviewed the appropriateness of the use of critical care facilities, with the audit outcome shown in Figure 8.

The assessors reported that over the period 2012–2020, 4.3% (14/327) of patients who did not receive critical care support were likely to have benefited from it. This number is close to the number identified by the treating surgeon. The treating surgeon perceived that a lack of critical care support was potentially an issue in only 3.3% (11/332) of cases.

Figure 8: Deaths with the use of critical care support compared to national data, 2012–2020



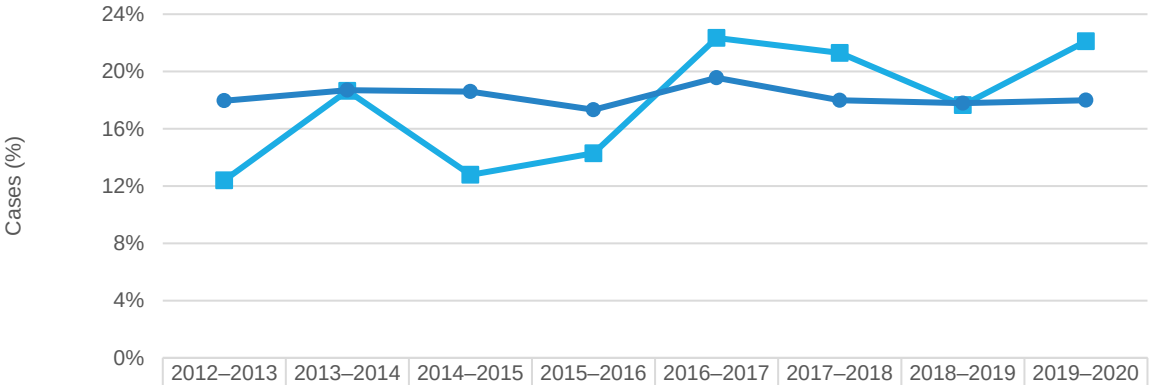
	2012–2013	2013–2014	2014–2015	2015–2016	2016–2017	2017–2018	2018–2019	2019–2020
TASM	59.5%	61.9%	60.9%	62.9%	68.1%	65.7%	62.7%	69.5%
National	60.3%	62.4%	63.9%	63.8%	63.4%	64.0%	62.0%	61.6%

Audit year

Abbreviations
TASM = Tasmanian Audit of Surgical Mortality.
Notes
n=579 out of 911 Tasmanian patients received critical care support from 1 July 2012 to 30 June 2020.
n=16,954 out of 27,025 national patients received critical care support from 1 July 2012 to 30 June 2020. Data not available: n=214.
Tasmanian data was excluded from the national data pool for the comparison.

Critical care management is an important area of clinical priority monitored by the audit. A seriously ill patient can be admitted to a critical care unit (CCU) unexpectedly, which can indicate that the care being provided needs to be addressed. Figure 9 illustrates Tasmanian and national CCU management over time.

Figure 9: Deaths with unplanned admission to CCU compared to national data, 2012–2020



	2012–2013	2013–2014	2014–2015	2015–2016	2016–2017	2017–2018	2018–2019	2019–2020
TASM	12.4%	18.6%	12.8%	14.3%	22.3%	21.3%	17.6%	22.1%
National	18.0%	18.7%	18.6%	17.3%	19.6%	18.0%	17.8%	18.0%

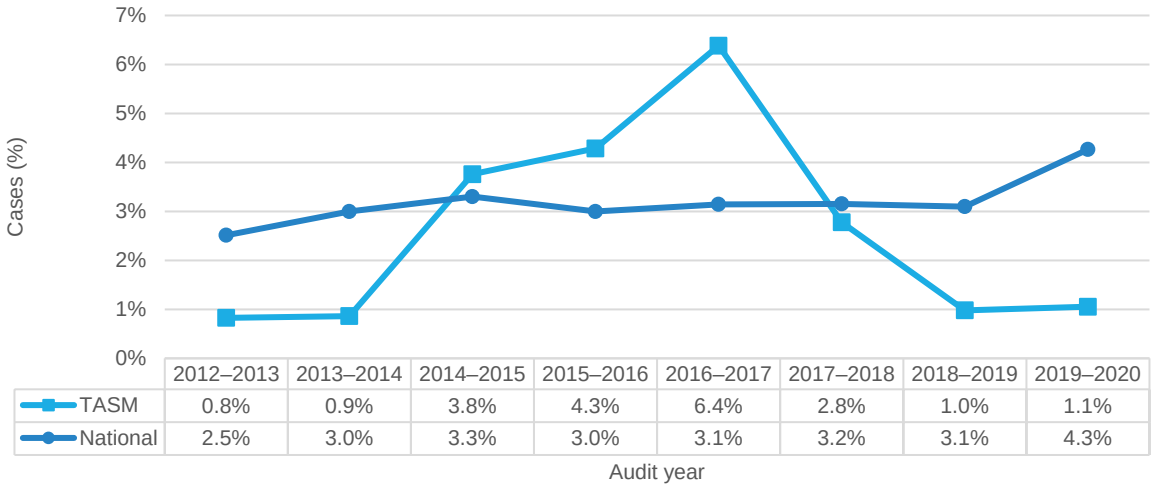
Audit year

Abbreviations
CCU = critical care unit, **TASM** = Tasmanian Audit of Surgical Mortality.
Notes
n=157 out of 911 Tasmanian patients had an unplanned admission to CCU from 1 July 2012 to 30 June 2020.
n=4,861 out of 26,647 national patients had an unplanned admission to CCU from 1 July 2012 to 30 June 2020. Data not available: n=592.
Tasmanian data was excluded from the national data pool for the comparison.

10.6 Unplanned readmission to hospital

In 2019–2020, the rate of unplanned readmission to hospital increased to 1.1% (1/95) for Tasmanian patients, significantly lower than the national findings of 4.3% (126/2,955). TASM will continue to monitor Tasmanian rates of unplanned readmission and seek ways to reduce the rate of readmission. This will contribute to better patient outcomes (including increased quality of life) and more effective utilisation of limited health system resources.

Figure 10: Deaths with unplanned readmission compared to national data, 2012–2020



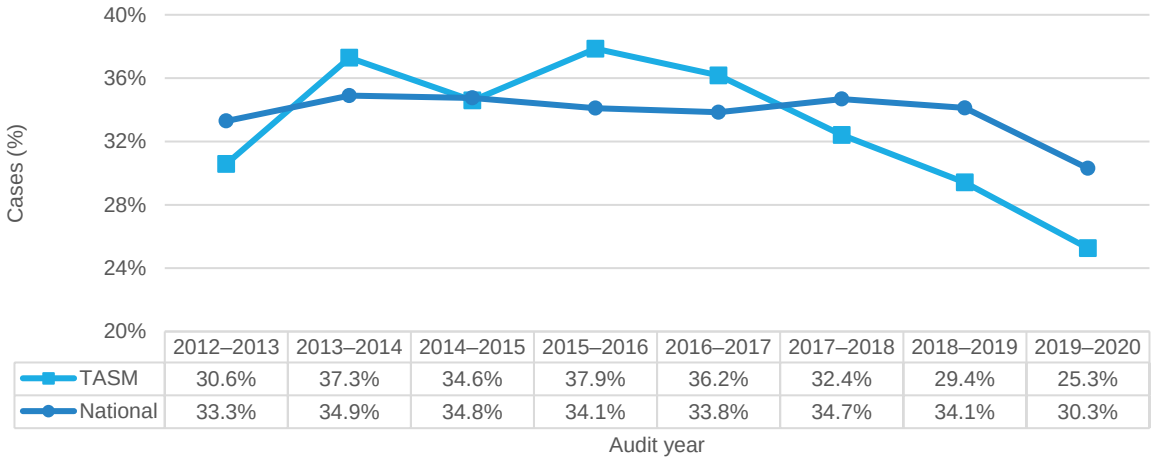
	2012–2013	2013–2014	2014–2015	2015–2016	2016–2017	2017–2018	2018–2019	2019–2020
TASM	0.8%	0.9%	3.8%	4.3%	6.4%	2.8%	1.0%	1.1%
National	2.5%	3.0%	3.3%	3.0%	3.1%	3.2%	3.1%	4.3%

Abbreviations
TASM = Tasmanian Audit of Surgical Mortality.
Notes
n=24 out of 909 Tasmanian patients had an unplanned readmission from 1 July 2012 to 30 June 2020. Data not available: n=2.
n=845 out of 26,585 national patients had an unplanned readmission from 1 July 2012 to 30 June 2020. Data not available: n=654.
Tasmanian data was excluded from the national data pool for the comparison.

10.7 Clinically significant infection

At the time of death, surgeons are asked to report on this clinical risk (Figure 11).

Figure 11: Deaths with a clinically significant infection compared to national data, 2012–2020



	2012–2013	2013–2014	2014–2015	2015–2016	2016–2017	2017–2018	2018–2019	2019–2020
TASM	30.6%	37.3%	34.6%	37.9%	36.2%	32.4%	29.4%	25.3%
National	33.3%	34.9%	34.8%	34.1%	33.8%	34.7%	34.1%	30.3%

Abbreviations
TASM = Tasmanian Audit of Surgical Mortality.
Notes
n=303 out of 911 Tasmanian patients had a clinically significant infection from 1 July 2012 to 30 June 2020.
n=8,964 out of 26,500 national patients had a clinically significant infection from 1 July 2012 to 30 June 2020. Data not available: n=739.
Tasmanian data was excluded from the national data pool for the comparison.

Details of audited deaths where clinically significant infections were acquired during admission are outlined in Table 3. Most reported infections in the current audit period were acquired postoperatively.

In Tasmania, this accounted for 50.0% (8/16) of infection cases, compared with 67.5% (314/465) nationally.

Table 3: Deaths with clinically significant infection acquired during admission, 2012–2020

Infection acquired	TASM 2012–2019	National 2012–2019	TASM 2019–2020	National 2019–2020
Acquired postoperatively	73.8% (118/160)	67.4% (2,906/4,313)	50.0% (8/16)	67.5% (314/465)
Acquired preoperatively	15.6% (25/160)	17.5% (755/4,313)	18.8% (3/16)	14.0% (65/465)
Other invasive site infection	3.8% (6/160)	7.2% (311/4,313)	18.8% (3/16)	13.1% (61/465)
Surgical-site infection	6.9% (11/160)	7.9% (341/4,313)	12.5% (2/16)	5.4% (25/465)

Abbreviations
TASM = Tasmanian Audit of Surgical Mortality.
Notes
n=303 out of 911 Tasmanian patients had a clinically significant infection from 1 July 2012 to 30 June 2020.
n=8,964 out of 26,500 national patients had a clinically significant infection from 1 July 2012 to 30 June 2020. Data not available: n=739.
Tasmanian data was excluded from the national data pool for the comparison.

For the current audit period, pneumonia and sepsis comprised 66.7% (16/24) of the reported cases of infection. The infective organism was identified in 33.3% (8/24) of the infection cohort. Strategies for reducing surgical-site infections have been implemented overseas and in Australia[8] and guidelines should be followed. Antibiotic prophylaxis is a good infection control measure in surgery and should be considered. The timeframe in which the infection was acquired can play a role in patient recovery following the surgical procedure.

The infection rate varied across individual specialties, reflecting their differing case mix. Over the period 2012–2020, Plastic Surgery had the highest reported infection rate at 63.6% (7/11) followed by Obstetrics and Gynaecology at 50.0% (1/2), Urology at 41.8% (23/55), General Surgery (including trauma and colorectal subspecialties) at 40.9% (174/425) and Orthopaedic Surgery at 34.3% (57/166).

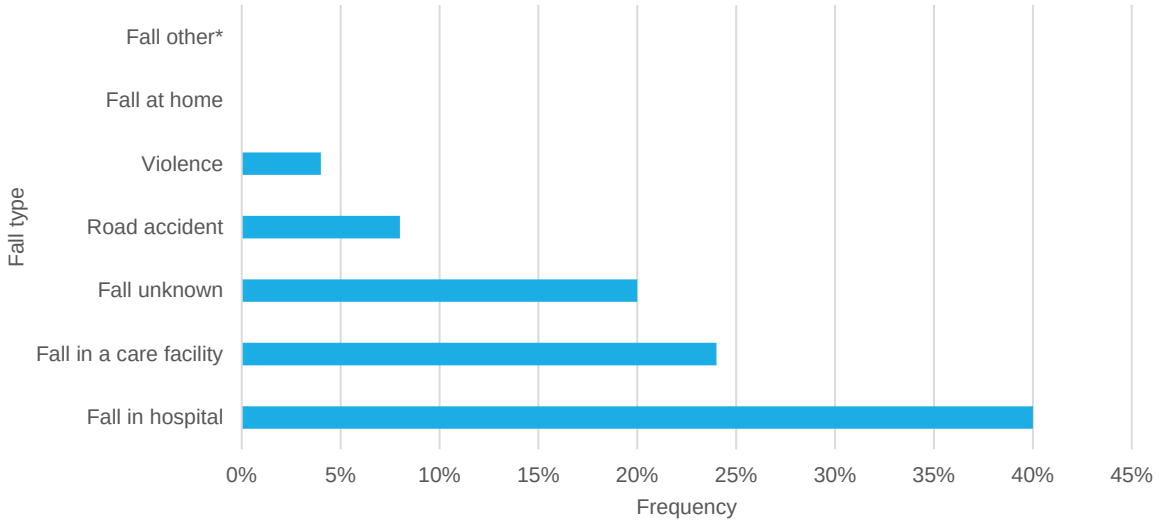
The average rate of surgical-site infections for patients in Tasmania for the period 2012–2019 was 6.9% (11/160); this increased to 12.5% (2/16) in the current audit period. The national findings show a decrease from 7.9% (341/4,313) to 5.4% (25/465) over the same time periods.[11]

10.8 Trauma

Trauma cases are those in which a patient received severe bodily injury or shock from a fall, accident or violence. TASM started collecting data on trauma cases in 2015 (Figure 12) to monitor trends and ensure strategies are implemented to prevent and minimise future harm. From 2015 to 2020, falls accounted for the majority of trauma (86.0%, 104/121) in Tasmania. Falls in hospital should be preventable, and TASM classifies them as an adverse event if related to a surgical patient's death.

Future trend analysis of falls will help inform strategies for improvement in this aspect of patient care, especially falls in care facilities or in hospitals.[12] TASM will include such strategies in its educational programs. A study found a reduction in postoperative falls in patients who participated in a preoperative education program.[13] Reviewing falls in trauma and orthopaedic cases can be a powerful tool to unite institutions to minimise risk and address issues.

Figure 12: Deaths with causes of trauma, 2019–2020



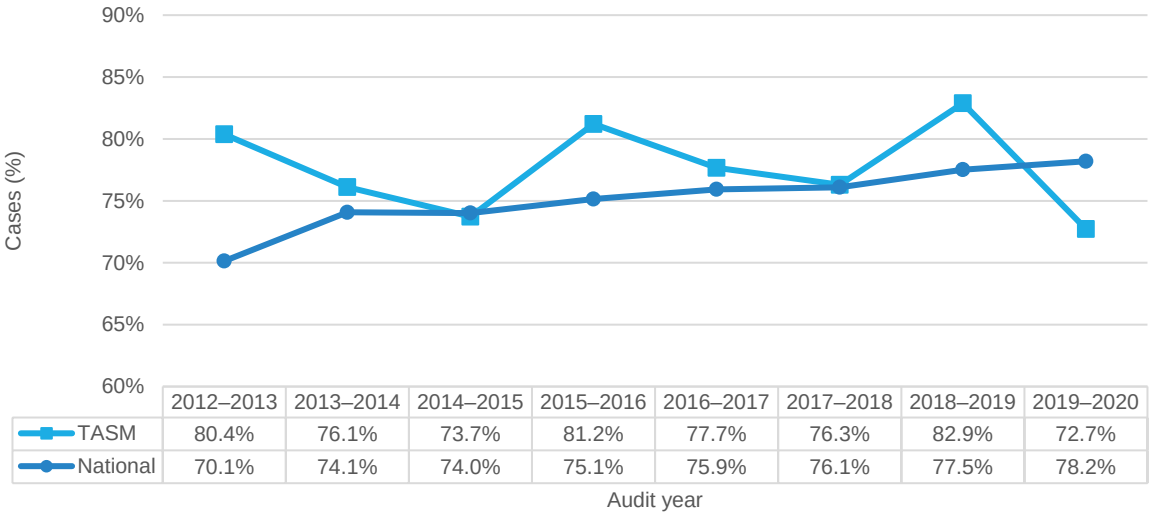
Notes
n=25 trauma cases in 95 Tasmanian patients from 1 July 2019 to 30 June 2020.
*Includes roads and public venues.

11 Profile of operative procedures

It is the role of the treating surgeon to take responsibility for the overall success of an operation. He or she must ensure that the operation proceeds smoothly with the lowest possible risk of complications, including the appropriate use of DVT prophylaxis, antibiotics and intensive care facilities; appropriate fluid balance; minimal unplanned returns to theatre; and appropriate involvement of the senior consultant, especially in a training environment.

Figure 13 shows the frequency of a consultant being present in theatre or being the most senior surgeon performing the procedure.

Figure 13: Operation with the consultant surgeon present in theatre compared to national data, 2012–2020



	2012–2013	2013–2014	2014–2015	2015–2016	2016–2017	2017–2018	2018–2019	2019–2020
TASM	80.4%	76.1%	73.7%	81.2%	77.7%	76.3%	82.9%	72.7%
National	70.1%	74.1%	74.0%	75.1%	75.9%	76.1%	77.5%	78.2%

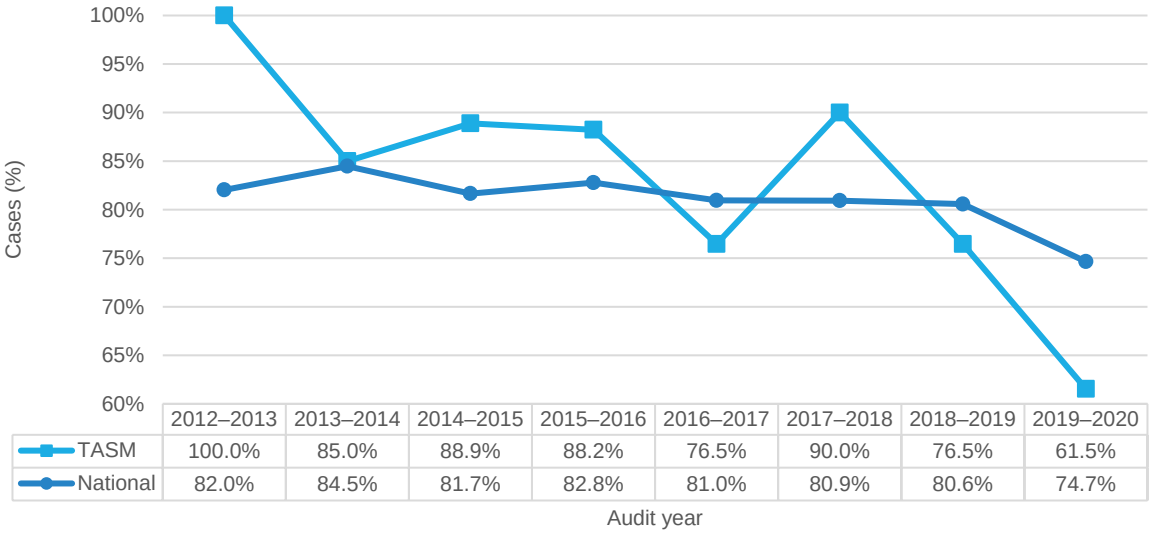
Abbreviations
TASM = Tasmanian Audit of Surgical Mortality.
Notes
n=954 operative episodes in 911 operative Tasmanian patients from 1 July 2012 to 30 June 2020.
n=30,935 operative episodes in 27,226 operative national patients from 1 July 2012 to 30 June 2020.
Tasmanian data was excluded from the national data pool for the comparison.

In the current audit period (2019–2020), 76.8% (73/95) of patients had at least one operative procedure.

The number of emergency admissions to a surgical unit requiring surgery within 24 hours was similar to previous year from 66.7% (44/66) in 2018–2019 to 67.2% (41/61) in 2019–2020.

Elective surgical procedures are those scheduled in advance that do not involve an immediate medical emergency. In 2019–2020, Tasmanian patients had elective surgery performed as planned in 61.5% (8/13) of cases, a decrease from the previous year (76.5%; 13/17). The decrease in elective surgery may have been impacted by hospital closures due to the COVID 19 pandemic.

Figure 14: Proportion of elective admissions with elective surgery performed, 2012–2020



	2012–2013	2013–2014	2014–2015	2015–2016	2016–2017	2017–2018	2018–2019	2019–2020
TASM	100.0%	85.0%	88.9%	88.2%	76.5%	90.0%	76.5%	61.5%
National	82.0%	84.5%	81.7%	82.8%	81.0%	80.9%	80.6%	74.7%

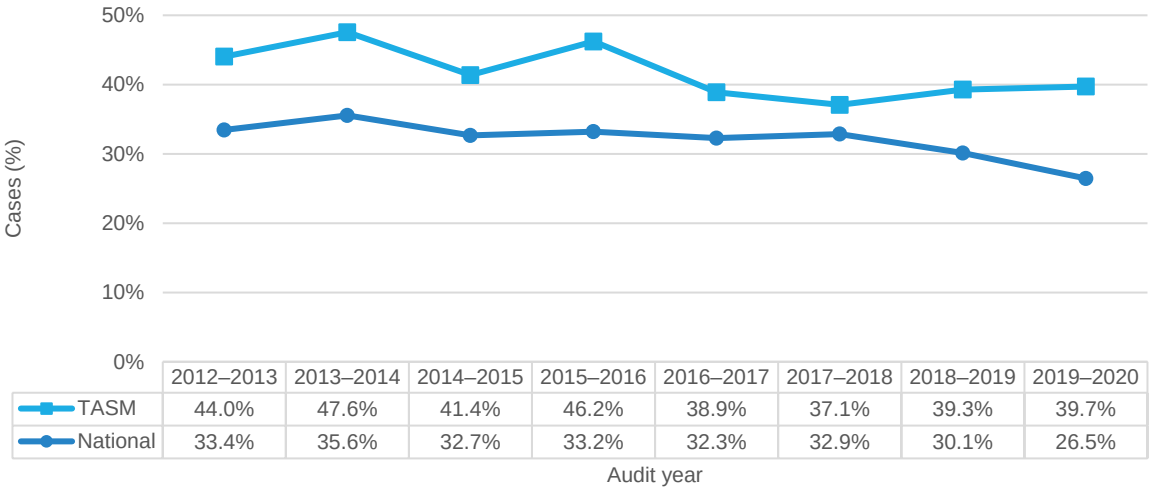
Abbreviations
TASM = Tasmanian Audit of Surgical Mortality.
Notes
n=115 out of 137 Tasmanian patients had elective admissions from 1 July 2012 to 30 June 2020. Data not available: n=22.
n=3,274 out of 4,035 national patients had elective admissions from 1 July 2012 to 30 June 2020. Data not available: n=761.
Tasmanian data was excluded from the national data pool for the comparison.

11.1 Postoperative complications

Complications can be expected following complex surgery due to a pre-existing comorbidity profile, surgical risk status and the nature of the disease being treated. In the current audit year, 60.3% (44/73) of audited Tasmanian patients had no complications, which is lower than the national rate in the same year (73.5%; 1,782/2,423).

Surgeons reported delays in recognising postoperative complications in 10.6% (30/282) of deaths over the period 2012–2020 (data not available: n=2).

Figure 15: Operative deaths with postoperative complications compared to national data, 2012–2020



	2012–2013	2013–2014	2014–2015	2015–2016	2016–2017	2017–2018	2018–2019	2019–2020
TASM	44.0%	47.6%	41.4%	46.2%	38.9%	37.1%	39.3%	39.7%
National	33.4%	35.6%	32.7%	33.2%	32.3%	32.9%	30.1%	26.5%

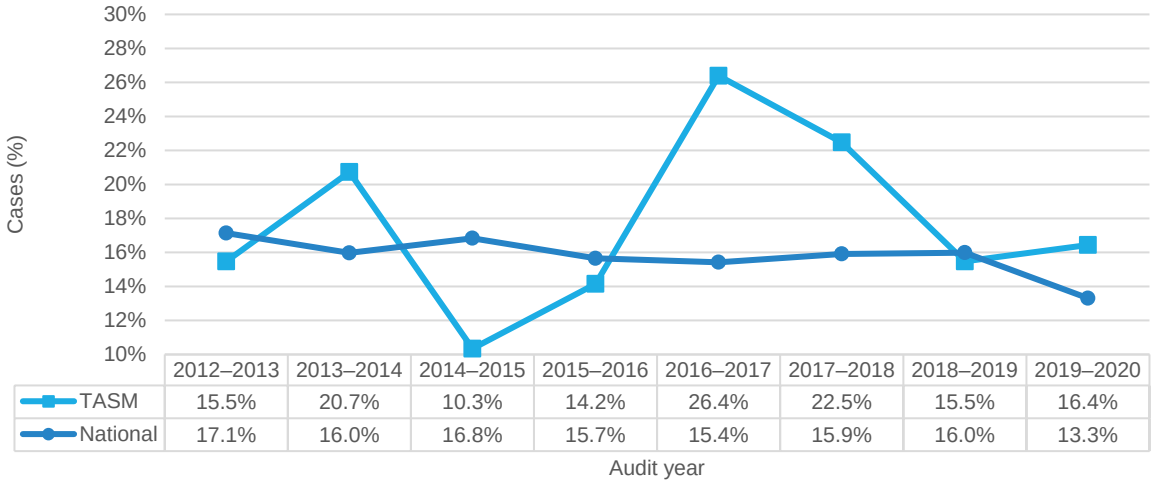
Abbreviations
TASM = Tasmanian Audit of Surgical Mortality.
Notes
n=284 out of 677 Tasmanian patients had postoperative complications from 1 July 2012 to 30 June 2020.
n=7,000 out of 21,795 national patients had postoperative complications from 1 July 2012 to 30 June 2020. Data not available: n=232.
Tasmanian data was excluded from the national data pool for the comparison.

11.2 Unplanned return to theatre

Some complications following complex surgery can be expected. A high rate of return to theatre can reflect timely recognition, intervention and escalation of care for complications on the ward; however, it can also indicate that the care being provided could be improved. Figure 16 shows operative deaths following an unplanned return to theatre.

In the current audit year, surgeons reported a higher rate of 16.4% (12/73) for patients in Tasmania, than the previous year and also higher than the national rate of 13.3% (324/2,434).

Figure 16: Operative deaths with unplanned return to theatre compared to national data, 2012–2020



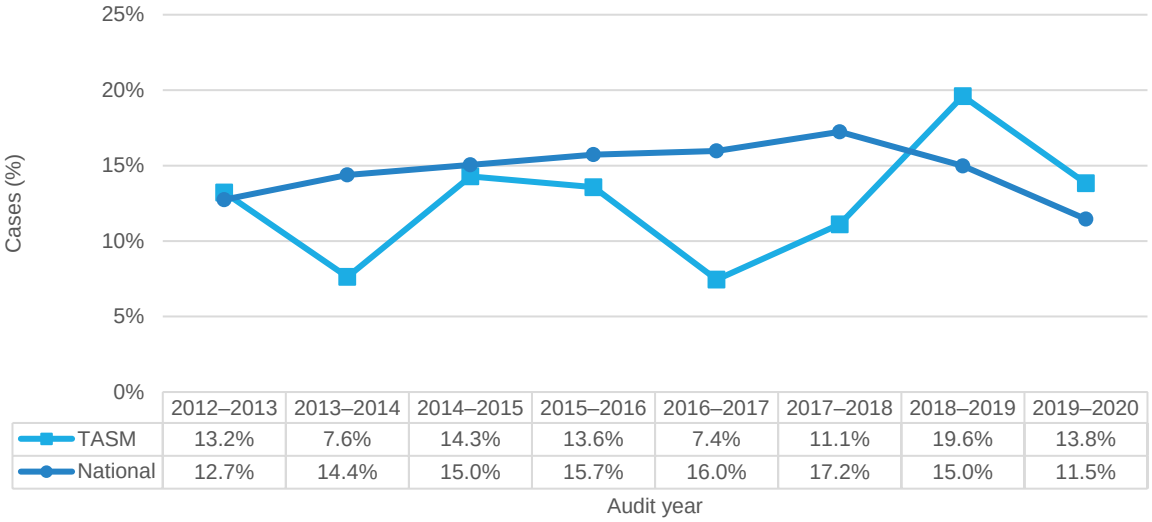
	2012–2013	2013–2014	2014–2015	2015–2016	2016–2017	2017–2018	2018–2019	2019–2020
TASM	15.5%	20.7%	10.3%	14.2%	26.4%	22.5%	15.5%	16.4%
National	17.1%	16.0%	16.8%	15.7%	15.4%	15.9%	16.0%	13.3%

Abbreviations
TASM = Tasmanian Audit of Surgical Mortality.
Notes
n=118 out of 677 Tasmanian patients had an unplanned return to theatre from 1 July 2012 to 30 June 2020.
n=3,443 out of 21,807 national patients had an unplanned return to theatre from 1 July 2012 to 30 June 2020. Data not available: n=220.
Tasmanian data was excluded from the national data pool for the comparison.

12 Peer-review process

FLAs were completed for 911 TASM cases, with 12.6% (115/911) of those cases requiring an in-depth SLA during the complete audit period (2012–2020).

Figure 17: Proportion of audited TASM deaths that underwent SLA compared to national data, 2012–2020



	2012–2013	2013–2014	2014–2015	2015–2016	2016–2017	2017–2018	2018–2019	2019–2020
TASM	13.2%	7.6%	14.3%	13.6%	7.4%	11.1%	19.6%	13.8%
National	12.7%	14.4%	15.0%	15.7%	16.0%	17.2%	15.0%	11.5%

Abbreviations
SLA = second-line assessment, **TASM** = Tasmanian Audit of Surgical Mortality.
Notes
n=115 cases out of 911 Tasmanian patients referred for SLA peer review from 1 July 2012 to 30 June 2020.
n=4,032 cases out of 27,229 national patients referred for SLA peer review from 1 July 2012 to 30 June 2020.
Tasmanian data was excluded from the national data pool for the comparison.

Each first-line assessor was asked to indicate whether the treating surgeon had provided adequate information to allow a conclusion to be reached. An SLA was requested if the information provided was deemed inadequate. SLAs are also requested if a more detailed case review is required, which could provide better clarification of events leading up to death, or if death was unexpected, for example a day surgery case or death of a young, fit patient with benign disease. These may represent suspected issues of clinical management.

Information provided in the SCFs has increased since audits began, but improvement is still needed. Reasons given for referral for SLA are provided in Table 4.

Table 4: Reasons for SLA referral, 2012–2020

Reason for SLA	TASM	National
SLA not required	87.4% (796/911)	85.2% (23,197/27,229)
SLA due to insufficient information	7.8% (71/911)	10.2% (2,789/27,229)
SLA due to further investigation	4.8% (44/911)	4.5% (1,236/27,229)
Total	100.0% (911/911)	100.0% (27,222/27,229)

Abbreviations
SLA = second-line assessment, **TASM** = Tasmanian Audit of Surgical Mortality.
Notes
n=911 Tasmanian patients referred for SLA peer review from 1 July 2012 to 30 June 2020.
n=27,229 national patients referred for SLA peer review from 1 July 2012 to 30 June 2020. Data not available: n=7.
Tasmanian data was excluded from the national data pool for the comparison.

At SLA, criticisms are also addressed for poor medical admission notes; missing reports, lack of/ missing imaging, transfer notes or follow-up records; and unsatisfactory descriptions of the surgical procedure. Comprehensive and legible hospital case notes are an important record of what has occurred during a patient's treatment. In the current audit year (2019–2020), over half (61.5%; 8/13) of TASM cases were sent for second-line peer review due to insufficient information. This was an increase from 45.0% (9/20) in 2018–2019. In the current audit year, 38.5% (5/13) of SLA requests arose from the need for a more detailed review of perceived issues of management. Overall, in the current audit year, major CMIs were identified in only 2.1**%** (20/95) of cases, where the FLA assessor sought an SLA.

Greater attention to detail in completing the SCF is always helpful to reduce the workload of colleagues who have agreed to act as first- and second-line assessors.

13 Outcomes of the peer review

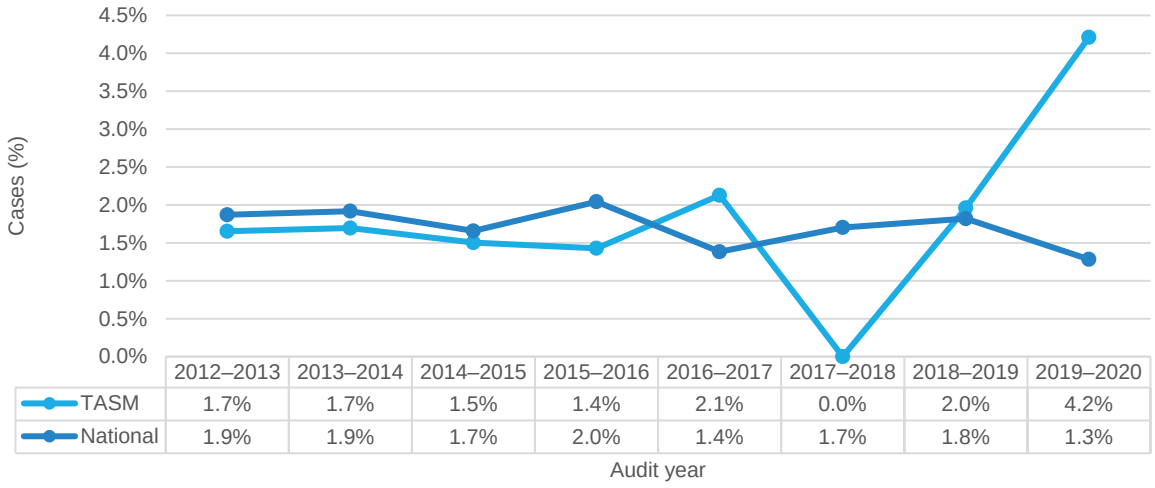
The TASM peer-review process is a retrospective examination of the clinical management of patients who died while under the care of a surgeon. All assessors must decide whether any aspects of patient management may have contributed to the outcome. In cases where it is thought that clinical management may have contributed to the death, TASM requires the assessor to attribute a level of severity, as outlined below:

- An area for consideration exists. The assessor believes an area of care **could** have been improved or done differently but recognises that this issue is debatable. It represents very minor criticism.
- An area of concern exists. The assessor believes that an area of care **should** have been better.
- An adverse event occurred. This is defined as an unintended injury or event **caused** by the medical management of the patient rather than by the disease process; the event was sufficiently serious to lead to prolonged hospitalisation or to temporary or permanent impairment or disability of the patient, or which directly contributed to or caused death.

13.1 Use of DVT prophylaxis

The assessor's perspective of inappropriate DVT prophylaxis treatment is outlined in Figure 18. In the current audit year, 4.2% (4/95) of cases were found by the assessors to have received inappropriate DVT prophylaxis; this was the highest percentage since 2016–2017.

Figure 18: Assessor perspective of inappropriate DVT prophylaxis treatment, 2012–2020



	2012–2013	2013–2014	2014–2015	2015–2016	2016–2017	2017–2018	2018–2019	2019–2020
TASM	1.7%	1.7%	1.5%	1.4%	2.1%	0.0%	2.0%	4.2%
National	1.9%	1.9%	1.7%	2.0%	1.4%	1.7%	1.8%	1.3%

Abbreviations
DVT = deep vein thrombosis, **TASM** = Tasmanian Audit of Surgical Mortality.
Notes
n=16 out of 911 operative Tasmanian patients associated with inappropriate prophylaxis from 1 July 2012 to 30 June 2020.
n=449 out of 26,188 operative national patients associated with inappropriate prophylaxis from 1 July 2012 to 30 June 2020. Data not available: n=1,040.
Tasmanian data was excluded from the national data pool for the comparison.

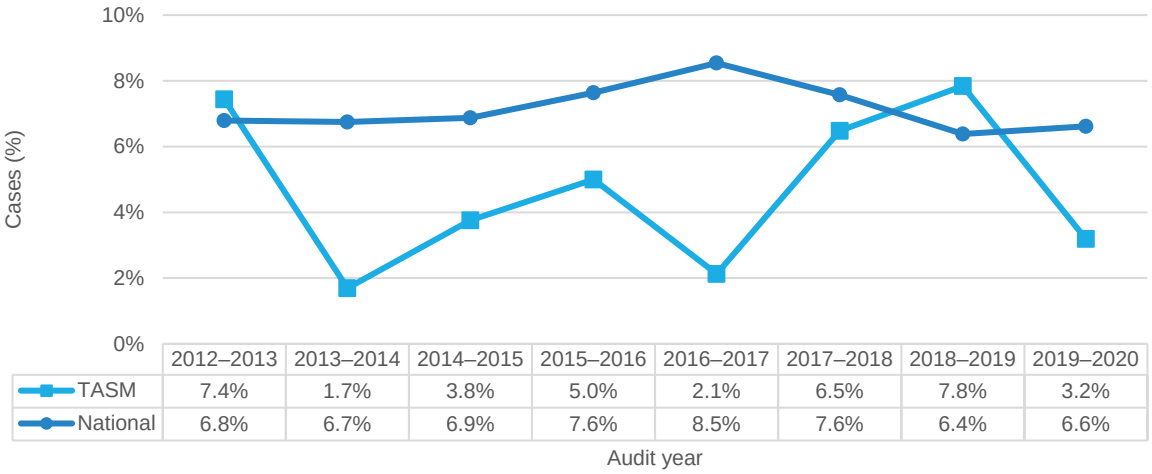
A decision by the treating team to actively withhold DVT prophylaxis within the operative pool of Tasmanian patients increased from 28.6% (4/14) in 2018–2019 to **57.1%** (4/7) in 2019–2020. From the Tasmanian peer reviews, the assessors agreed with the use or non-use of DVT prophylaxis in 66.3**%** (63/95) of cases in 2019–2020, a decrease from 85.3% (87/102) in 2018–2019.

13.2 Issues with fluid balance

Surgical consultants and clinical teams should be competent in fluid management strategies. The treating surgeon and all assessors were asked to comment on the appropriateness of fluid balance during the episode of care.

Figure 19 shows cases relating to fluid balance issues. In 2019–2020, assessors reported that 3.2% (3/95) of audited deaths in Tasmania had fluid balance issues.

Figure 19: Assessor perspective on fluid balance issues compared to national data, 2012–2020



	2012–2013	2013–2014	2014–2015	2015–2016	2016–2017	2017–2018	2018–2019	2019–2020
TASM	7.4%	1.7%	3.8%	5.0%	2.1%	6.5%	7.8%	3.2%
National	6.8%	6.7%	6.9%	7.6%	8.5%	7.6%	6.4%	6.6%

Abbreviations
TASM = Tasmanian Audit of Surgical Mortality.
Notes
n=43 out of 911 Tasmanian patients associated with fluid balance issues from 1 July 2012 to 30 June 2020.
n=1,882 out of 26,260 national patients associated with fluid balance issues from 1 July 2012 to 30 June 2020. Data not available: n=968.
Tasmanian data was excluded from the national data pool for the comparison.

13.3 CMIs

Patients may have more than one CMI associated with the care that ultimately led to their death. A weighting system (from less severe to most severe) accounting for criticisms identified per patient is used to analyse deficiencies in clinical care (Table 5).

Audited cases may have multiple CMIs identified per patient. The percentage of patients affected is the important measure. Details about the issues identified are presented in Table 6.

Table 5: Severity of criticism of perceived CMIs

	Less severe	←		Most severe
Areas of clinical incidents	None detected	Consideration	Concern	Adverse event
Outcomes of incidents	Not applicable	Did not affect clinical outcome	May have contributed to death	Probably contributed to death
Preventable incidents	Not applicable	Probably not	Probably	Definitely
Association of incidents	Not applicable	Hospital	Clinical team	Surgical team

CMI causes and associated trends are monitored closely by TASM and remain the focus of reports and educational events.

For the current audit period, assessors perceived that CMIs occurred in 21.1% (20/95) of cases within the audited patient pool. Minor issues (areas of consideration) of patient management were perceived to have occurred in 9.5% (9/95) of cases, and areas of concern were identified in 7.4% (7/95) of cases in the current audit year. In the same year, 4.2% (4/95) of cases were categorised as an adverse event. Preventable adverse events or concerns have decreased from 16.8% (17/101) in 2018–2019 to 10.5% (10/95) in 2019–2020.

Table 6: CMI areas

Year	2012–2013	2013–2014	2014–2015	2015–2016	2016–2017	2017–2018	2018–2019	2019–2020
No issue identified	73.9% (88/119)	78.3% (90/115)	73.7% (98/133)	75.0% (105/140)	74.5% (70/94)	76.9% (83/108)	68.3% (69/101)	78.9% (75/95)
Area of consideration	16.8% (20/119)	13.9% (16/115)	12.8% (17/133)	12.1% (17/140)	13.8% (13/94)	11.1% (12/108)	11.9% (12/101)	9.5% (9/95)
Area of concern	4.2% (5/119)	3.5% (4/115)	6.8% (9/133)	7.9% (11/140)	7.4% (7/94)	6.5% (7/108)	7.9% (8/101)	7.4% (7/95)
Adverse event	5.0% (6/119)	4.3% (5/115)	6.8% (9/133)	5.0% (7/140)	4.3% (4/94)	5.6% (6/108)	11.9% (12/101)	4.2% (4/95)
Preventable issue	16.8% (20/119)	11.3% (13/115)	18.0% (24/133)	18.6% (26/140)	16.0% (15/94)	16.7% (18/108)	22.8% (23/101)	16.8% (16/95)
Adverse event or concern that was preventable	5.9% (7/119)	5.2% (6/115)	11.3% (15/133)	10.7% (15/140)	8.5% (8/94)	9.3% (10/108)	16.8% (17/101)	10.5% (10/95)
Adverse event or concern that was preventable that contributed to the death	1.7% (2/119)	1.7% (2/115)	3.0% (4/133)	2.9% (4/140)	2.1% (2/94)	2.8% (3/108)	5.9% (6/101)	1.1% (1/95)

Abbreviations
CMI = clinical management issue.

14 Preventable CMIs

Table 7 lists the most severe CMI (areas of concern or adverse event), and the possible prevention, identified by assessors in 2019–2020.

This one case indicates the importance of full investigation and communication of the patient's condition prior to transfer to a tertiary hospital, and the commencement of medical treatment prior to that transfer.

Table 7: Complete series of preventable CMIs that contributed to death identified by the highest level of assessment, 2019–2020

Admission phase	Adverse event area	Adverse event preventable	Adverse event details
Prior to transfer	Adverse event	Preventable	Patient should have been intubated prior to transfer

Abbreviations
CMI = clinical management issue.

14.1 Scope for improved management of surgical care

Table 8 shows the point of surgical care at which assessors considered that care management could have been improved. This allows for better understanding of improving surgical care in Tasmania and nationally.

In Tasmania, management issues regarding the decision to operate at all, preoperative management/preparation, choice of operation, timing of operation, intraoperative/technical management of surgery, and postoperative care considerations have been similar over the audit period to the national figures; however, in the current year they are greater than the national figures.

Table 8: Areas for surgical care improvements as identified by assessors at different phases of care, 2019–2020

Area for improvement	TASM	National
Preoperative management/preparation	10.6%	7.0%
Decision to operate at all	6.4%	6.3%
Choice of operation	2.1%	3.4%
Timing of operation (too late, too soon, wrong time of day)	6.4%	5.1%
Intraoperative/technical management of surgery	4.3%	3.5%
Grade/experience of surgeon deciding	1.1%	0.6%
Grade/experience of surgeon operating	2.1%	0.8%
Postoperative care	4.3%	4.0%

Abbreviations
TASM = Tasmanian Audit of Surgical Mortality.
Notes
Audit period 1 July 2019 to 30 June 2020.
Tasmanian data was excluded from the national data pool for the comparison.

To encourage improvement, the audit office actively disseminates problems identified from the data to clinicians and healthcare services via educational events, hospital forums, committee meetings, individual feedback letters to the treating surgeon, hospital governance reports, scientific papers and newsletters.

14.2 TASM and national trends in CMI areas

TASM outcomes and national trends in areas of CMIs can be a catalyst for clinical governance management in surgical health services as per the NSQHS Standards. Tasmanian findings regarding CMIs are compared with national data in Table 9. Over the 2012–2020 period, Tasmanian consultant surgeons were present in 77.7% (741/954) of operations compared to 75.2% (23,262/30,935) nationally.

Table 9: Clinical management comparisons between TASM and national data, 2019–2020

Variable	TASM	National
Audited deaths with delay in surgical diagnosis	7.4% (7/95)	4.7% (140/2,971)
Audited deaths with delay in transfer	5.6% (1/18)	9.4% (68/722)
Audited deaths without use of ICU or HDU	69.5% (66/95)	61.6% (1,830/2,972)
Audited deaths with unplanned admission to ICU	22.1% (21/95)	18.0% (532/2,957)
Audited deaths with unplanned readmission	1.1% (1/95)	4.3% (126/2,955)
Audited deaths with a clinically significant infection	25.3% (24/95)	30.3% (899/2,967)
Operation with the consultant surgeon present in theatre	72.7% (72/99)	78.2% (2,593/3,316)
Proportion of elective admissions with elective surgery performed	61.5% (8/13)	74.7% (324/434)
Audited operative deaths with postoperative complications	39.7% (29/73)	26.5% (641/2,423)
Audited operative deaths with unplanned return to theatre	16.4% (12/73)	13.3% (324/2,434)
Inappropriate DVT prophylaxis treatment as viewed by the assessor	4.2% (4/95)	1.3% (37/2,884)
Audited deaths with fluid balance issues as viewed by the assessor	3.2% (3/95)	6.6% (191/2,887)

Abbreviations
DVT = deep vein thrombosis, **HDU =** high dependency unit, **ICU =** intensive care unit, **TASM =** Tasmanian Audit of Surgical Mortality.
Notes
Audit period 1 July 2019 to 30 June 2020.
Denominator varies due to different criteria for each row.
Tasmanian data was excluded from the national data pool for the comparison.

15 Conclusion

In this report, TASM has demonstrated trends in CMIs related to surgical deaths over the past 8 years of the audit. Although it is positive to see a reduction in the number of preventable CMIs recorded, the identified issues highlight ongoing opportunities for system-wide improvements.

There has been a reduction of surgical procedures being performed in Tasmania due to restrictions imposed during the COVID pandemic. This will be reflected upon in the next report where the backlog should be addressed.

The number of hospital outliers has decreased, with fewer hospitals being highlighted because of high rates of preventable issues. This further indicates that appropriate measures are being taken by individual hospitals to improve their performance and their overall management of surgical patients.

TASM continues to emphasise the importance of clinical leadership in providing a clear patient management pathway and treatment plans that are understood by all those involved in the patient's care. Multidisciplinary collaboration should not be delayed, noting that good communication is vital to improving patient management. This includes the need for detailed handovers and ensuring adequate documentation is kept in the patient healthcare record.

TASM, together with the support of the Tasmanian hospitals, will continue to monitor preventable CMIs, along with postoperative transfers involving surgery, as a helpful measure for ensuring the highest standard of safe and comprehensive surgical care in Tasmania.

16 References

1. Victorian Audit of Surgical Mortality. Reports and publications: annual reports. Melbourne: Royal Australasian College of Surgeons; 2019. Available from: https://www.surgeons.org/for-health-professionals/audits-and-surgical-research/anzasm/vasm/#Reports_and_Publications.
2. Australian Commission on Safety and Quality in Health Care. National Safety and Quality Health Service Standards: second edition. Sydney: Australian Commission on Safety and Quality in Health Care; 2019. Available from: https://www.safetyandquality.gov.au/wp-content/uploads/2017/12/National-Safety-and-Quality-Health-Service-Standards-second-edition.pdf.
3. Victorian Audit of Surgical Mortality. Case Note Review Booklet. Melbourne: Royal Australasian College of Surgeons; 2019. Available from: https://www.surgeons.org/for-health-professionals/audits-and-surgical-research/anzasm/vasm/#CNRB.
4. American Society of Anesthesiologists (ASA). ASA Physical Status Classification System. Park Ridge, Illinois; 2017. Available from: http://www.asahq.org/resources/clinical-information/asa-physical-status-classification-system.
5. Charles A, Cross W, Griffiths D. What do clinicians understand about deaths reportable to the coroner? *J Forensic Leg Med*. 2017;51:76-80.
6. Wilkinson K, Martin IC, Gough MJ, Stewart JAD, Lucas SB, Freeth H, et al. An age-old problem: a review of the care received by elderly patients undergoing surgery. National Confidential Enquiry into Patient Outcome and Death [Internet]. 2010:[pp. 1-17]. Available from: http://www.ncepod.org.uk/2010report3/downloads/EESE_fullReport.pdf.
7. National Health and Medical Research Council. Clinical practice guideline for the prevention of venous thromboembolism in patients admitted to Australian hospitals. Melbourne: National Health and Medical Research Council; 2009.
8. Worth LJ, Bull AL, Spelman T, Brett J, Richards MJ. Diminishing surgical site infections in Australia: time trends in infection rates, pathogens and antimicrobial resistance using a comprehensive Victorian surveillance program, 2002–2013. *Infect Control Hosp Epidemiol*. 2015;36(4):409-16.
9. Royal Australasian College of Surgeons. Prevention of healthcare associated infection in surgery. Melbourne: Royal Australasian College of Surgeons; 2015. Available from: http://www.surgeons.org/media/297157/2015-05–20_pos_fes-pst-009_prevention_of_healthcare_associated_infection_in_surgery.pdf.
10. Worth LJ, Spelman T, Bull AL, Richards MJ. A major reduction in hospital-onset Staphylococcus aureus bacteremia in Australia: a question of definition. *Clin Infect Dis*. 2014;59(12):1808-9.
11. Worth LJ, Spelman T, Bull AL, Richards MJ. Staphylococcus aureus bloodstream infection in Australian hospitals: findings from a Victorian surveillance system. *Med J Aust*. 2014;200(5):282-4.
12. Cunningham J WD, Robinson KM and Paul L,. A comparison of state and national Australian data on external cause of injury due to falls. *Health Inf Manag J*. 2013;42(3).
13. Clarke HD, Timm VL, Goldberg BR, SJ H. Preoperative patient education reduces in-hospital falls after total knee arthroplasty. *Clin Orthop Relat Res*. 2012;470(1):244-9.