Royal Australasian
College of Surgeons

The Western Australian Audit of Surgical Mortality (WAASM)

2026 Report
Data Definitions

5-year review
Jan 2021 - Dec 2025

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Data definitions

Figure 1: WAASM deaths, by quarter	
Definition	Number of deaths reported to WAASM per quarter.
Data included	All deaths falling within WAASM criteria (n = 3,231).
Data excluded	All 'excluded error' cases (n = 172).
Figure 2: WAASM deaths and mortality rate per 100,000 WA population, by quarter	
Definition	Number of deaths falling within WAASM criteria per quarter and mortality rates per 100,000 WA population.
Data included	All deaths falling within WAASM criteria (n = 3,231).
Data excluded	All 'excluded error' cases (n = 172).
Figure 3: Case status, by quarter	
Definition	Deaths falling within WAASM criteria and audit case status per quarter. Audit process complete comprised all cases that have completed the entire audit process. Pending cases comprised all 'surgical case pending', 'surgical case incomplete', 'first-line assessment pending', 'first-line assessment complete', 'second-line assessment pending', 'medical records pending' and 'medical records received' cases. Terminal care cases comprised 'excluded terminal care' cases.
Data included	All deaths falling within WAASM criteria (n = 3,231).
Data excluded	All 'excluded error' cases (n = 172).
Figure 4: Deaths by hospital status, by year	
Definition	Percentage of all cases by hospital status per year. Co-location hospitals are those that provide privately and publicly funded surgical services; data for co-location hospitals includes public and private patients.
Data included	All deaths falling within WAASM criteria where hospital status was reported (n = 2,994).
Data excluded	All 'excluded error', 'surgical case pending', and 'excluded terminal care' cases. Data missing; n = 1.
Figure 5: Deaths by surgical specialty and hospital admission, 2021–2025	
Definition	Percentage of surgical mortality data in relation to surgeon specialty and hospital admission.
Data included	All deaths falling within WAASM criteria where hospital admission was reported (n = 2,993).
Data excluded	All 'excluded error', 'surgical case pending', and 'excluded terminal care' cases. Data missing; n = 2.

Figure 6: Cases with specific comorbidities, 2021–2025	
Definition	Percentage of cases with comorbidities.
Data included	All deaths falling within WAASM criteria where comorbidities were reported. Most of the cases reported more than one type of comorbidity.
Data excluded	All 'excluded error', 'surgical case pending', and 'excluded terminal care' cases. All cases where no comorbidities were reported.
Figure 7: Frequency of American Society of Anesthesiologists grades, by quarter	
Definition	Percentage of cases by ASA grade per quarter.
Data included	All deaths falling within WAASM criteria where ASA grades were reported (n = 2,982).
Data excluded	All 'excluded error', 'surgical case pending', and 'excluded terminal care' cases. All cases where no ASA grades were reported on. Data missing; n = 13.
Figure 8: Most common causes of death 2021–2025, by Read code*	
Definition	Percentage and description (in Read code) of the 6 most common causes of deaths.
Data included	All deaths falling within WAASM criteria. Some cases had more than one cause of death reported.
Data excluded	All 'excluded error', 'surgical case pending', and 'excluded terminal care' cases.
Figure 9: Preoperative hospital transfers, by quarter	
Definition	Percentage of hospital transfers per quarter.
Data included	All deaths falling within WAASM criteria where transfers were reported (n = 2,994).
Data excluded	All 'excluded error', 'surgical case pending', and 'excluded terminal care' cases. Data missing; n = 1.
Figure 10: Preoperative transfer issues, 2021–2025	
Definition	Percentage of issues associated with hospital transfers.
Data included	All deaths falling within WAASM criteria where transfer issues were reported (n = 902).
Data excluded	All 'excluded error', 'surgical case pending', and 'excluded terminal care' cases. All cases where transfers and transfer issues were not reported. Data missing; 'inappropriate level of care' n = 4; 'insufficient clinical information' n = 4; 'inappropriate transfer' n = 3; 'delay in transfer' n = 3.
Figure 11: Critical care unit use, by quarter	
Definition	Percentage of CCU use per quarter.
Data included	All deaths falling within WAASM criteria where CCU use was reported (n = 1,671).
Data excluded	All 'excluded error', 'surgical case pending', and 'excluded terminal care' cases. All cases where non-use of CCU was reported. Data missing; n = 2.

Figure 12: Preoperative diagnostic delays, by quarter	
Definition	Percentage of cases with preoperative diagnostic delays per quarter.
Data included	All deaths falling within WAASM criteria where preoperative diagnostic delays were reported (n = 132).
Data excluded	All 'excluded error', 'surgical case pending', and 'excluded terminal care' cases. All cases where no preoperative diagnostic delays were reported. Data missing; n = 1.
Figure 13: Operative and nonoperative cases, by quarter	
Definition	Percentage of operative and nonoperative cases per quarter.
Data included	All deaths falling within WAASM criteria where operative and nonoperative status was reported (n = 2,993).
Data excluded	All 'excluded error', 'surgical case pending', and 'excluded terminal care' cases. Data missing; n = 2.
Figure 14: Reasons for not operating, by quarter	
Definition	Percentage of cases with reasons for not operating per quarter.
Data included	All nonoperative deaths falling within WAASM criteria where reasons for no operation were reported (n = 1,200). Some cases reported more than one reason for not operating.
Data excluded	All 'excluded error', 'surgical case pending', and 'excluded terminal care' cases. All cases where an operation was reported. Data missing; n = 2.
Figure 15: Consultant surgeon involvement in operations, by quarter	
Definition	Percentage of consultant surgeons deciding, operating, assisting and supervising in theatre per quarter.
Data included	All deaths falling within WAASM criteria where the number of operations performed was reported (n = 2,334).
Data excluded	All 'excluded error', 'surgical case pending', and 'excluded terminal care' cases. All cases where an operation was not reported.
Figure 16: Unplanned return to theatre, by quarter	
Definition	Percentage of unplanned returns to operating theatre per quarter.
Data included	All deaths falling within WAASM criteria where unplanned returns to operating theatre were reported (n = 247).
Data excluded	All 'excluded error', 'surgical case pending', and 'excluded terminal care' cases. All nonoperative cases and all operative cases where unplanned return to theatre was not reported.

Figure 17: Postoperative complications, by quarter	
Definition	Percentage of postoperative complications per quarter.
Data included	All deaths falling within WAASM criteria where postoperative complications were reported (n = 442). It is possible for patients to have more than one postoperative complication.
Data excluded	All 'excluded error', 'surgical case pending', and 'excluded terminal care' cases. All cases where an operation was not reported and all operative cases where a postoperative complication was not reported.
Figure 18: Deep vein thrombosis prophylaxis use, by quarter	
Definition	Percentage of DVT prophylaxis use per quarter.
Data included	All deaths falling within WAASM criteria where use of DVT prophylaxis was reported (n = 2,305).
Data excluded	All 'excluded error', 'surgical case pending', and 'excluded terminal care' cases. Data missing; n = 3.
Figure 19: Type of deep vein thrombosis prophylaxis used, 2021–2025	
Definition	Percentage of type of DVT prophylaxis used.
Data included	All deaths falling within WAASM criteria where DVT prophylaxis was used. Some cases reported more than one type of DVT prophylaxis used.
Data excluded	All 'excluded error', 'surgical case pending', and 'excluded terminal care' cases. All cases where non-use of DVT prophylaxis and type of DVT prophylaxis were not reported.
Figure 20: Clinically significant infections during admission, 2021–2025	
Definition	Percentage of cases with clinically significant infections acquired during admission.
Data included	All deaths falling within WAASM criteria where clinically significant infections acquired during admission were reported (n = 428).
Data excluded	All 'excluded error', 'surgical case pending', and 'excluded terminal care' cases. All cases where a clinically significant infection during admission was not reported.
Figure 21: Type of clinically significant infection reported, 2021–2025	
Definition	Percentage of type of clinically significant infections reported.
Data included	All deaths falling within WAASM criteria where type of clinically significant infections was reported (n = 935).
Data excluded	All 'excluded error', 'surgical case pending', and 'excluded terminal care' cases. All cases where a clinically significant infection was not reported. Data missing; n = 3.

Figure 22: Assessor perception of areas for patient management improvement, 2021–2025	
Definition	Percentage of cases where areas for improvement in the care of the patient were reviewed, as reported by assessors.
Data included	All deaths falling within WAASM criteria where patient management improvement was reported, using the highest level of assessment in completed cases (n = 2,498).
Data excluded	All 'excluded error', 'surgical case pending', 'surgical case incomplete', 'first-line assessment pending', 'second-line assessment pending', 'excluded terminal care', 'medical record pending', and 'medical records received' cases. All Neurosurgery cases. Data missing; 'preoperative management' n = 32; 'decision to operate' n = 31; 'timing of operation' n = 32; 'postoperative care' n =33; 'choice of operation' n = 32; 'intraoperative management' n = 33; 'operating surgeon experience' n = 39; 'deciding surgeon experience' n = 33.
Figure 23: Cases with any clinical management issues, by quarter	
Definition	Percentage of cases with CMIs per quarter, as reported by assessors.
Data included	All deaths falling within WAASM criteria where CMIs were reported, using the highest level of assessment in completed cases (n = 2,944).
Data excluded	All 'excluded error', 'surgical case pending', 'surgical case incomplete ', first-line assessment pending', 'second-line assessment pending', 'excluded terminal care', 'medical record pending', and 'medical records received' cases; and all cases where CMIs were not reported.
Figure 24: Categories of clinical management issues, by quarter	
Definition	Percentage of categories of CMIs, as reported by assessors. Based on the number of incidents of CMIs, not the number of patients.
Data included	All deaths falling within WAASM criteria where categories of CMIs were reported, using the highest level of assessment in completed cases (n = 620).
Data excluded	All 'excluded error', 'surgical case pending', 'surgical case incomplete', 'first-line assessment pending', 'second-line assessment pending', 'excluded terminal care', 'medical record pending', and 'medical records received' cases; and all cases where CMIs were not reported.
Figure 25: Assessor perception of impact of adverse event on clinical outcome, by year	
Definition	Number of perceived impacts of adverse events per year, as reported by assessors. Based on the number of incidents of CMIs, not the number of patients.
Data included	All deaths falling within WAASM criteria where the perceived impact of adverse events was reported, using the highest level of assessment in completed cases (n = 76).
Data excluded	All 'excluded error', 'surgical case pending', 'surgical case incomplete', 'first-line assessment pending', 'second-line assessment pending', 'excluded terminal care', 'medical record pending', and 'medical records received' cases; all cases where CMIs were not reported; and all cases where 'areas for consideration' and 'areas of concern' were reported.

Figure 26: Assessor perception of preventability of adverse event causing death, by year	
Definition	Number of perceived preventability of adverse events causing death per year, as reported by assessors. Based on the number of incidents of CMIs, not the number of patients.
Data included	All deaths falling within WAASM criteria where preventability of adverse events causing death was reported, using the highest level of assessment in completed cases (n = 34).
Data excluded	All 'excluded error', 'surgical case pending', 'surgical case incomplete', 'first-line assessment pending', 'second-line assessment pending', 'excluded terminal care', 'medical record pending', and 'medical records received' cases; all cases where CMIs were not reported; all cases where 'areas for consideration' and 'areas of concern' were not reported; and all cases where adverse events not causing death were reported.
Figure 27: Most frequently reported clinical management issues 2021–2025, by Read code*	
Definition	Percentage and description (in Read code) of the 10 most common CMIs, as reported by assessors.
Data included	All deaths falling within WAASM criteria where CMIs were reported (n = 399).
Data excluded	All 'excluded error', 'surgical case pending', 'surgical case incomplete', 'first-line assessment pending', 'second-line assessment pending', 'excluded terminal care', 'medical record pending', and 'medical records received' cases; and all cases where CMIs were not reported.
Figure 28: Deaths by major surgical specialty, by quarter	
Definition	Number of deaths by major surgical specialty per quarter.
Data included	All General Surgery, Orthopaedic Surgery, Neurosurgery, Vascular Surgery, Cardiothoracic Surgery, and Urology deaths falling within WAASM criteria (n = 3,103).
Data excluded	All 'excluded error', Otolaryngology Head & Neck Surgery, Ophthalmology, Paediatric Surgery, Obstetrics & Gynaecology, and Plastic Surgery deaths.
Figure 29: Emergency and elective admissions, by quarter	
Definition	Number of emergency and elective admissions per quarter.
Data included	All deaths falling within WAASM criteria where emergency and elective admissions were reported (n = 2,993).
Data excluded	All 'excluded error', 'surgical case pending', and 'excluded terminal care' cases. Data missing; n = 2.
Figure 30: Nonoperative and terminal care cases, by quarter	
Definition	Number of nonoperative and terminal care cases per quarter.
Data included	All deaths falling within WAASM criteria where no operation and terminal care were reported (n = 1,392).
Data excluded	All 'excluded error' and 'surgical case pending' cases. All cases where an operation was reported. Data missing; n = 2.

Figure 31: General Surgery nonoperative and terminal care cases, by quarter	
Definition	Number of General Surgery nonoperative and terminal care cases per quarter.
Data included	All General Surgery deaths falling within WAASM criteria where no operation and terminal care were reported (n = 853).
Data excluded	All 'excluded error' and 'surgical case pending' cases. All cases where an operation was reported. Data missing; n = 1.
Figure 32: General Surgery emergency nonoperative cases, by quarter	
Definition	Number of General Surgery emergency admission cases where no operation occurred per quarter.
Data included	All General Surgery deaths falling within WAASM criteria where emergency admission and no operation were reported (n = 739).
Data excluded	All 'excluded error', 'surgical case pending', and 'excluded terminal care' cases. All cases where an elective admission or operation were reported.
Figure 33: General Surgery emergency operative cases, by quarter	
Definition	Number of General Surgery emergency admission cases where an operation occurred per quarter.
Data included	All General Surgery deaths falling within WAASM criteria where an emergency admission and an operation were reported (n = 499).
Data excluded	All 'excluded error', 'surgical case pending', and 'excluded terminal care' cases. All cases where an elective admission or no operation were reported.

Table 1: Deaths reported to WAASM, by year	
Definition	Number of deaths reported to WAASM per year.
Data included	All data collected between 2021 and 2025. Total numbers of deaths reported to WAASM, including 'excluded error' cases (n = 3,403).
Data excluded	No exclusions.
Table 2: WAASM deaths by surgical specialty, 2021–2025	
Definition	Number and percentage of surgical mortality data in relation to surgeon specialty.
Data included	All deaths falling within WAASM criteria (n = 3,231).
Data excluded	All 'excluded error' cases (n = 172).
Table 3: Median age and patient sex, 2021–2025	
Definition	Median age by sex for all cases.
Data included	All deaths falling within WAASM criteria (n = 3,231).
Data excluded	All 'excluded error' cases (n = 172).
Table 4: Peer-review assessments, by year	
Definition	Number of FLAs returned, and number and percentage of cases where SLAs were recommended per year.
Data included	All deaths falling within WAASM criteria where an FLA was returned (n = 2,981).
Data excluded	All 'excluded error', 'surgical case pending', 'surgical case incomplete', 'first-line pending', and 'excluded terminal care' cases.

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