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# 9 Emergency management

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### **Attachment tables**

Attachment tables are identified in references throughout this chapter by a '9A' suffix (for example, table 9A.3). A full list of attachment tables is provided at the end of this chapter, and the attachment tables are available from the Review website at [www.pc.gov.au/gsp](http://www.pc.gov.au/gsp).

Emergency management aims to reduce the level of risk to the community of emergencies occurring, reduce the adverse effects of emergency events, and improve the level and perception of safety in the community. This chapter reports on selected emergency events, including fire, ambulance (pre-hospital care, treatment and transport) and emergency road crash rescue events. While section 9.1 contains some information on the scope of emergency services organisation (ESO)

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activities, the chapter does not report on the total range of State, Territory and local government activities.

This year data quality information for fire deaths is available online at [www.pc.gov.au/gsp](http://www.pc.gov.au/gsp). Data quality information for other indicators is under development. A text box on the cost of road crashes in Australia is included in Road Crash Rescue events. Additional measures are reported against the cardiac arrest indicator (to include data for paramedic-witnessed cardiac arrests) and the patient overall satisfaction indicator in Ambulance events has been expanded to measuring four specific aspects of patient satisfaction.

Major improvements in reporting on emergency services this year include:

- inclusion of a mini-case study
- inclusion of some ‘data quality information’ (DQI) documentation.

## **9.1 Profile of emergency management**

Emergency management is defined as a range of measures to manage risks to communities and the environment (EMA 2004). The emergency management sector includes a range of agencies engaged in areas as diverse as risk assessment, legislation, community development, emergency response, urban development and land use management, and community recovery.

The range of events encompassed by emergency management includes fires, medical emergencies and transport, rescues, natural disasters (that is, bushfire, earthquake, flood, storm, cyclone, storm surge, landslide, tsunami, meteorite strike, and tornado<sup>1</sup>), consequences of acts of terrorism, technological and hazardous material incidents (such as chemical spills, harmful gas leaks, radiological contamination, explosions, and spills of petroleum and petroleum products), and the quarantine and control of diseases and biological contaminants. Emergency management aims to create and strengthen safe, sustainable and resilient communities that can avoid or minimise the effects of emergencies and, at the same time, have the ability to recover quickly and restore their socioeconomic vitality after an emergency event.

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<sup>1</sup> This list of natural disaster events is based on the Australian Government Natural Disaster Relief and Recovery Arrangement definition. Under this definition, natural disasters do not include drought, frost, heatwave, epidemic, or disaster events resulting from poor environmental planning, commercial development or personal intervention (other than arson) (EMA 2007).

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## Roles and responsibilities

The practice of emergency management requires cooperation among Australian, State, Territory and local governments, industry, community organisations and the community in general.

At the meeting of the Council of Australian Governments (COAG) on 7 December 2009, COAG agreed to a new whole-of-nation, ‘resilience’ based approach to natural disaster policy and programs, which recognises that a disaster resilient community is one that works together to understand and manage the risks that it confronts.

As illustrated in figure 9.1, COAG agreed to establish a new National Emergency Management Committee (NEMC), comprising relevant senior officials from Commonwealth, State and Territory governments, and a representative from the Australian Local Government Association. The NEMC reports to the Ministerial Council for Police and Emergency Management — Emergency Management (MCPEM-EM) on matters within the MCPEM-EM charter, and to other Ministerial Councils as required. However, recognising that many aspects of emergency management require the ability to influence work outside the mandate of emergency management ministers, the NEMC also has a direct reporting line to COAG for matters requiring whole-of-governments consideration.

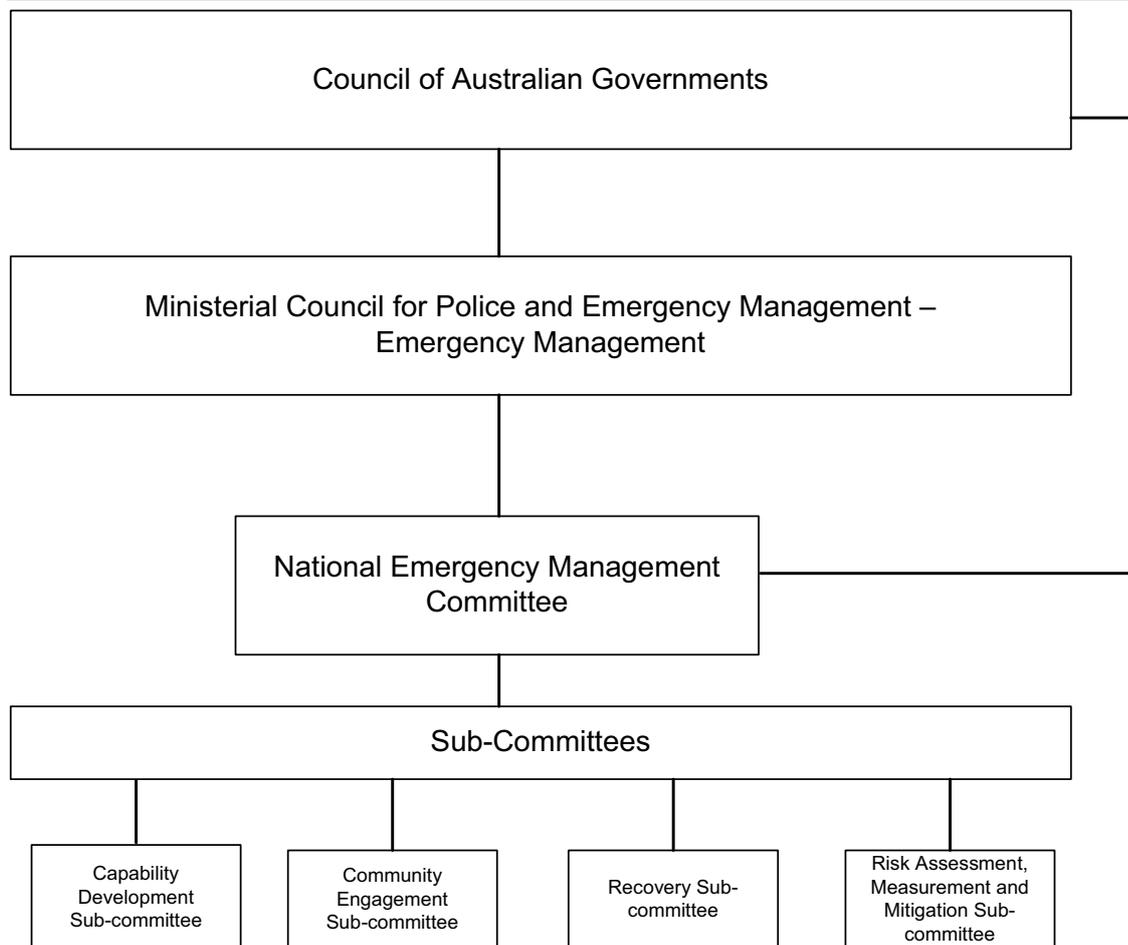
The vision for the NEMC is: ‘A safer, more resilient Australian community.’ The NEMC works to strengthen the nation’s disaster resilience by providing strategic leadership on nation-wide emergency management policy. The work of NEMC is supported by four sub-committees:

- The Capability Development Sub-Committee (CDSC) supports strategic nation-wide whole-of-governments emergency management capability initiatives
- The Community Recovery Sub-Committee develops and promotes holistic disaster recovery policy and planning consistent with the National Principles for Disaster Recovery.
- The Community Engagement Sub-Committee develops and promotes national community engagement policies and programs, in order to contribute to the enhancement of community disaster resilience nationally.
- The Risk Assessment Measurement and Mitigation Sub-Committee contributes to the management of disaster risk by developing national approaches to risk assessment, measurement and mitigation.

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**Figure 9.1 National Emergency Management Committee**

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### *Government arrangements*

#### *Australian Government*

The Australian Government administrative arrangements referred to in this section reflect the arrangements in place as at 17 October 2010. The primary role of the Australian Government is to support the development, by the states and territories, of a national emergency management capability.

Australian Government assistance may take the form of:

- material and technical assistance to states and territories in the event of large scale emergencies
- financial assistance for natural disaster resilience, mitigation and preparedness measures

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- support for emergency relief and community recovery and for helping to bear the cost of natural disasters
  - funding for risk management programs and undertaking comprehensive risk assessment and
  - community awareness activities.

Australian Government agencies also have specific emergency management responsibilities, including: the control of exotic animal and plant diseases; aviation and maritime search and rescue; the management of major marine pollution and meteorological and geological hazards; the provision of firefighting services at some airports and some defence installations; human quarantine; and research and development.

#### *State and Territory governments*

State and Territory governments are responsible for regulatory arrangements for protecting life, property and the environment, and they have primary responsibility for delivering emergency services (including fire and ambulance services) directly to the community.

#### *Local governments*

Local governments in some states and territories are involved to varying degrees in emergency management. Their roles and responsibilities may include:

- considering community safety in regional and urban planning by assessing risks, and developing mitigation measures and prevention plans to address emergencies such as bushfires and structure fires, floods, storms, landslides and hazardous materials incidents
- improving community preparedness through local emergency and disaster planning
- issuing hazard reduction notices to private land holders and clearing vegetation in high risk public areas
- collecting statutory levies to fund fire and other emergency services
- allocating resources for response and recovery activities
- providing financial and operational assistance to rural fire brigades and/or other voluntary emergency service units.

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### *Emergency service organisations*

State, Territory and local governments provide emergency management services to the community through a range of ESOs. The governance and reporting lines of ESOs vary across jurisdictions. These organisations range from government departments to statutory authorities, and to smaller branches, agencies or services within larger departments or authorities. In some instances, non-government organisations also provide emergency management (and other ambulance event) services, such as St John Ambulance in WA and the NT.

In all jurisdictions, there is considerable cooperation and coordination among ESOs in response to emergency events. There can also be substantial cooperative efforts across governments, particularly in the recovery stages after a major incident. Events of considerable magnitude and duration, such as earthquakes, cyclones and bushfires, can involve international, interstate and other cooperation and support. Jurisdictions are increasingly interacting and contributing to programs and operational response to a number of significant emergency events around the Pacific and Indian Ocean rim.

### *Fire service organisations*

State and Territory governments provide a range of emergency management activities through fire service organisations, including prevention/mitigation, preparedness, response and recovery (see framework section 9.2). The role of fire service organisations varies across jurisdictions and includes involvement in an expanding range of activities (table 9A.38) including:

- developing building fire safety codes and inspecting fire safety equipment and practices
- training and educating the community to achieve community awareness and behavioural change in relation to fire and road safety issues
- assisting individuals and communities to prepare for bushfires and other hazards
- responding to structure, bush, vehicle and other fires
- providing rural land management advice on the role and use of fire
- providing road crash rescue and other rescue services
- managing hazardous material incidents
- administering legislation relating to fire safety, hazardous materials facilities and hazard mitigation
- investigating fire cause and origin

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- wide ranging industry research activities
  - a number of specialist rescue capabilities, including Urban Search and Rescue
  - providing emergency medical services such as Community First Responder
  - counter-terrorist preparedness work with Police agencies and consequence management relating to a terrorist attack.

Fire service organisations work closely with other government departments and agencies — including ESOs such as the State Emergency Service/Territory Emergency Service (S/TES), police and ambulance services, and community service organisations — to minimise the impact of fire and other emergencies on the community. Their governance arrangements differ across jurisdictions (table 9A.37).

Separate urban and rural fire service organisations deliver fire services in most jurisdictions. Land management agencies typically also provide fire services within designated areas. However, currently only NSW, Victoria, WA and Tasmania are able to report fire activity for land management agencies, and financial information relating to these agencies is limited to Victoria. Jurisdictions with more than one fire authority can separate services in different ways — for example, NSW separates fire services based on service function and geographic area, whereas Victoria separates fire services by geographic area only.

Some jurisdictions have particular arrangements for the provision of fire services in Indigenous communities. (For more information on fire services in Indigenous communities see SCRCSSP 2002, p. 572. and SCRGSP 2009, p. 11.35.)

#### *State Emergency Services and Territory Emergency Services organisations*

State and Territory governments contribute to a range of emergency management activities through S/TES. The activities of S/TES (table 9A.39) include prevention/mitigation, preparedness, response and recovery (see framework section 9.2). In all jurisdictions except ACT, S/TES have a major role in attending road crash rescue incidents and performing extrications. S/TES in various jurisdictions are the lead combat agency for hazards as diverse as earthquake, tsunami, tropical cyclone and marine search and rescue. S/TES also provide land search, urban search and rescue, and technical rescue services.

#### *Ambulance service organisations*

State and Territory governments provide ambulance services in most jurisdictions. In WA and the NT, St John Ambulance is under contract to the respective

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governments as the primary provider of ambulance services (box 9.1). Across jurisdictions the role of ambulance service organisations as an integral part of the health system generally includes:

- providing emergency and non-emergency pre-hospital and out-of-hospital patient care and transport
- undertaking inter-hospital patient transport including the movement of critical patients
- conducting specialised rescue services
- preparing for and providing capacity for the ambulance component of multi-casualty events
- enhancing the community's capacity to respond to emergencies.

Funding responsibilities of State and Territory governments include ambulance services and, jointly with the Commonwealth, emergency responses, including responding to public emergencies and support for emergency air retrieval (COAG 2009).

There are fixed and rotary wing (helicopter) ambulance services in all jurisdictions. In most jurisdictions these services are provided by the ambulance service organisations through various contractual arrangements. In WA, SA, Queensland and the NT, all or most of the cost of air ambulance services falls outside of the ambulance service organisations (see also section 9.5 for a discussion of air ambulance services).

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### Box 9.1 Relationships of primary ambulance response and management organisations to government

<i>NSW</i>	<i>Ambulance Service of NSW</i> — a division of the Department of Health reporting to the Minister for Health
<i>Vic</i>	<i>Ambulance Victoria</i> — a separate statutory body reporting to the Minister for Health
<i>Qld</i>	<i>Queensland Ambulance Service</i> — a division of the Department of Community Safety, reporting to the Director-General, who reports to the Minister for Police, Corrective Services and Emergency Services
<i>WA</i>	<i>St John Ambulance</i> — an incorporated not-for-profit organisation under contract to the WA Government
<i>SA</i>	<i>SA Ambulance Service (SAAS)</i> — an identifiable incorporated entity under the SA Health Care Act
<i>Tas</i>	<i>Ambulance Tasmania</i> — a statutory service of the Department of Health and Human Services
<i>ACT</i>	<i>ACT Ambulance Service</i> — one of four operational services that comprise the ACT Emergency Services Agency, Department of Justice and Community Safety (the other operational services are the ACT Fire Brigade, ACT Rural Fire Service and ACT State Emergency Service). The Department reports to the ACT Minister for Police and Emergency Services
<i>NT</i>	<i>St John Ambulance</i> — an incorporated not-for-profit organisation under contract to the NT Government

Source: State and Territory governments (unpublished).

#### *Other ESOs*

The ‘all-hazards all-agencies’ approach to emergency management means that there are many organisations involved in aspects of the prevention/mitigation, preparedness, response and recovery framework for emergency management. This Report focuses on selected event types in State and Territory jurisdictions, and in particular the roles of fire, S/TES and ambulance service organisations. This Report does not yet report directly on the performance of Australian Government or local government emergency management services or their agencies.

#### *Volunteers in emergency management*

In 2009-10, approximately 250 000 fire, ambulance and S/TES volunteers played a significant role in the provision of emergency services in Australia (table 9.1). The input by volunteers is particularly important in rural and remote service provision where caseload/incident levels are low but community safety needs are still a high priority.

Volunteers in many ESOs — including fire, ambulance, S/TES, marine rescue, and recovery and relief agencies — provide services relating to emergency situations

and disasters resulting from natural hazards such as wildfires, floods, severe storms, earthquakes, cyclones, and human caused and technological events as well as medical emergencies.

**Table 9.1 Volunteers in emergency service organisations<sup>a, b</sup>**

	<i>NSW</i> <sup>c</sup>	<i>Vic</i> <sup>d</sup>	<i>Qld</i> <sup>e</sup>	<i>WA</i> <sup>f</sup>	<i>SA</i>	<i>Tas</i>	<i>ACT</i>	<i>NT</i> <sup>g</sup>	<i>Aust</i>
<b>ASOs</b>									
2006-07	121	897	416	2 839	1 619	507	–	10	6 409
2007-08	163	437	225	2 960	1 534	507	–	10	5 836
2008-09	205	494	188	2 566	1 502	574	–	13	5 542
2009-10	226	489	136	2 818	1 385	508	–	26	5 588
<b>FSOs</b>									
2006-07	76 302	59 509	36 000	27 305	15 517	4 978	1 261	550	221 422
2007-08	75 474	58 362	35 000	27 457	15 744	4 909	1 367	540	218 853
2008-09	75 436	58 943	34 000	27 249	15 415	4 859	1 230	540	217 672
2009-10	77 422	59 180	34 000	29 343	15 064	4 861	1 228	750	221 848
<b>S/TES</b>									
2006-07	10 331	4 411	7 000	1 854	1 821	525	191	347	26 480
2007-08	10 114	4 833	6 430	1 827	1 828	560	205	293	26 090
2008-09	10 954	5 500	6 300	1 900	1 613	584	247	299	26 951
2009-10	10 359	5 500	6 800	1 914	1 532	537	229	335	27 206
<b>Total</b>									
2006-07	<b>86 754</b>	<b>64 817</b>	<b>43 416</b>	<b>31 998</b>	<b>18 957</b>	<b>6 010</b>	<b>1 452</b>	<b>907</b>	<b>254 311</b>
2007-08	<b>85 751</b>	<b>63 632</b>	<b>41 655</b>	<b>32 244</b>	<b>19 106</b>	<b>5 976</b>	<b>1 572</b>	<b>843</b>	<b>250 779</b>
2008-09	<b>86 595</b>	<b>64 937</b>	<b>40 488</b>	<b>31 715</b>	<b>18 530</b>	<b>6 017</b>	<b>1 477</b>	<b>852</b>	<b>250 611</b>
2009-10	<b>88 007</b>	<b>65 169</b>	<b>40 936</b>	<b>34 075</b>	<b>17 981</b>	<b>5 906</b>	<b>1 457</b>	<b>1 111</b>	<b>254 642</b>

ASO = ambulance service organisation. FSO = fire service organisation. S/TES = State and Territory emergency services. <sup>a</sup> Numbers for FSOs include volunteer support staff plus part paid volunteers for all jurisdictions except WA and the ACT. <sup>b</sup> Previous years ASOs data may not be comparable as volunteer data for 2007-08 and subsequent years are categorised into volunteers with transport capability and first responders with no transport capability. Data for 2007-08 and subsequent years exclude first responders. <sup>c</sup> NSW: Numbers for FSOs include retained firefighters and community fire unit members. <sup>d</sup> Vic: ASOs data include some volunteers who were remunerated for some time (usually response), but not for other time (usually on-call). Victorian Permanent Fire fighter numbers are over reported between 2005-06 and 2008-09 due to inclusion of some non-fire fighting personnel from within Victoria's land management agencies. <sup>e</sup> Qld. Volunteer numbers may fluctuate as members leave the service, new members are recruited and data cleansing occurs. In addition, the decrease of ASOs from 2007-08 to 2008-09 can be attributed to the removal from this category of university students undergoing paramedical studies enrolled as Honorary Officers. <sup>f</sup> WA: SES data exclude volunteer emergency service members who also may undertake an SES role. Revision of counting rules identified a reporting error in the figures for 2008-09, which have been re-stated. WA: Support staff data for 2006-07 and subsequent years include all non-fire specific staff, including those that support SES and volunteer marine rescue. Volunteer firefighter data include volunteers from local government bush fire brigades, volunteer fire and rescue brigades, volunteer fire services and multi-skilled volunteer emergency services. Data for the Department of Environment and Conservation are not included. <sup>g</sup> NT: Transient people in the NT result in fluctuations in the numbers of volunteers. – Nil or rounded to zero.

Source: State and Territory governments (unpublished); tables 9A.5, 9A.21 and 9A.24.

Information on the estimated value of volunteers to S/TES is outlined in box 9.2.

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Although volunteers make a valuable contribution, they are not a free resource to governments. Governments incur costs in supporting volunteers to deliver emergency services in their communities, by providing funds and support through infrastructure, training, uniforms, personal protective equipment, operational equipment and support for other operating costs.

### **Box 9.2 Value of volunteers to State/Territory Emergency Services**

State/Territory Emergency Services (S/TES) are dedicated to helping communities prepare for and respond to unexpected events, and play a vital role in emergency management in all states and territories. The Australian Council of State Emergency Services (ACSES) funded a study to estimate the value of SES volunteer time based on data provided by the SES agencies in NSW, Victoria, SA and Tasmania.

Two approaches were used to estimate the economic value of SES volunteer time:

- the global substitution method, where an average wage rate is used to value all activities
- the task specific substitution method, where each task is valued at its market wage rate.

In both approaches operational tasks and time, including emergency response and community activities, were valued, as well as time spent on training, travel, administration and other tasks.

The value of volunteer time for community preparedness services, operational response, training and unit management (without stand-by time) from 1994-95 to 2004-05 averaged around \$52 million (NSW), \$19 million (Victoria) and \$12 million (SA) a year.

Stand-by time accounts for about 94 per cent of the total time in NSW and Victoria and about half the total value for NSW and 39 per cent for Victoria. The total time volunteers made available including stand-by time is worth more than \$86 million and \$41 million a year to NSW and Victoria respectively. For NSW the annual value of a volunteer's contribution was estimated as \$15 903. While the indirect or secondary benefits that may arise through volunteerism as explained through social capital theory were not valued, the study clearly shows the significant value volunteers provide to their communities.

*Source:* Ganewatta, G. and Handmer, J. (2007).

Volunteer activity has implications for the interpretation of financial and non-financial performance indicators in this chapter. Notional wages costs for volunteers are not reflected in monetary estimates of inputs or outputs, which means that data for some performance indicators may be misleading where the input of volunteers is not counted but affects outputs and outcomes. This issue may be

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explored in the future as the Steering Committee continues to examine data on rural and remote service provision in the emergency services sector.

## **9.2 Framework for measuring the performance of emergency management**

The broad aim of emergency management is to reduce the level of risk to the community from emergencies. The framework of performance indicators in this chapter is based on objectives for emergency management that are common to all Australian ESOs (box 9.3).

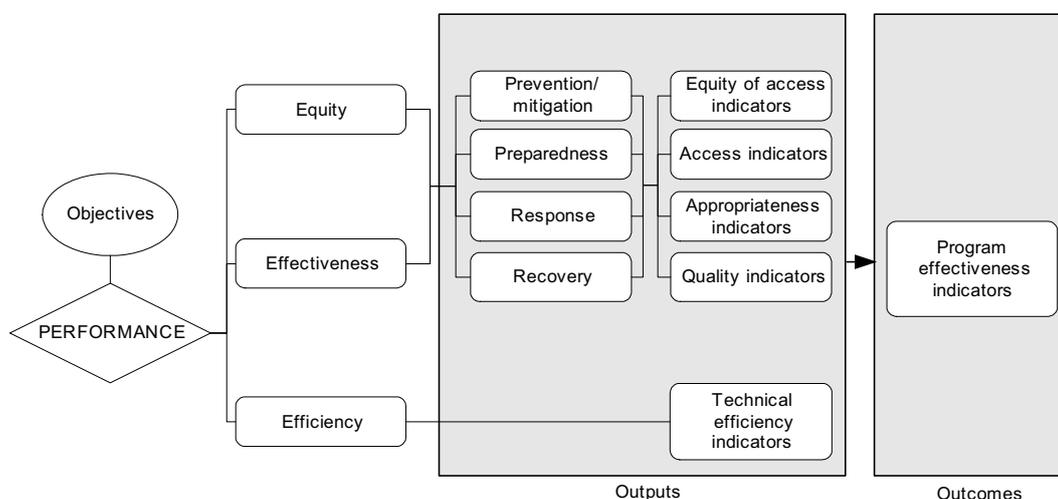
### **Box 9.3 Objectives for emergency management**

Emergency management services aim to provide highly effective, efficient and accessible services that:

- reduce the adverse effects of emergencies and disasters on the community (including people, property, infrastructure, economy and environment)
- contribute to the management of risks to the community
- enhance public safety.

Emergency service organisations aim to reduce the number of emergency events through prevention activities, and to reduce the impact of emergency events through community and operational preparedness. Fast, effective response and recovery services are critical to containing hazards and managing the consequences of emergency events. The prevention/mitigation, preparedness, response and recovery performance indicator framework (figure 9.2) used in this chapter for fire and road crash rescue events reflects these activities.

Figure 9.2 **General performance indicator framework for emergency management**



The framework uses the widely accepted ‘comprehensive approach’ (prevention/mitigation, preparedness, response and recovery) to classify the key functions common to ESOs in managing emergency events. Outputs in the emergency event frameworks are grouped accordingly.

- *Prevention/mitigation* — the results of measures taken in advance of an emergency aimed at decreasing or eliminating its impact on the community and the environment. Activities that contribute to prevention and mitigation include: advice on land management practice and planning; the inspection of property and buildings for hazards, compliance with standards and building codes, and levels of safe practices; the preparation of risk assessment and emergency management plans; risk categorisation for public information campaigns; and public information campaigns and educational programs to promote safe practices in the community.
- *Preparedness* — the results of measures to ensure, if an emergency occurs, that communities, resources and services are capable of responding to, and coping with, the effects. Activities that contribute to preparedness include: public education and training; emergency detection and response planning (including the installation of smoke alarms and/or sprinklers); hazardous chemicals and material certification, and the inspection of storage and handling arrangements; the exercising, training and testing of emergency service personnel; and standby and resource deployment and maintenance. Preparedness also involves establishing equipment standards and monitoring adherence to those standards.
- *Response* — the results of strategies and services to control, limit or modify the emergency to reduce its consequences. Activities that contribute to response

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include: the implementation of emergency plans and procedures; the issuing of emergency warnings; the mobilisation of resources in response to emergency incidents; the suppression of hazards (for example, fire containment); the provision of immediate medical assistance and relief; and search and rescue.

- *Recovery (community)* — the results of strategies and services to support affected individuals and communities in their reconstruction of physical infrastructure and their restoration of emotional, social, economic and physical wellbeing. Activities that contribute to community recovery include: the restoration of essential services; counselling programs; temporary housing; long term medical care; and public health and safety information.
- *Recovery (ESOs)* — the results of strategies and services to return agencies to a state of preparedness after emergency situations. Activities that contribute to emergency services recovery include: critical incident stress debriefing; and the return of ESO resources to the state of readiness specified in response plans.

Effective prevention activities reduce the requirement to respond to, and recover from, emergency events. Every jurisdiction is placing a greater emphasis on preventative activities. Efficient resource use reduces the cost of delivering a service of specified quality.

Outcome indicators in the performance framework indicate the contribution of ESOs to the community, economy and environment. Those currently reported are:

- for fire events: the ‘fire death rate’; ‘fire injury rate’; ‘median dollar losses from structure fire’; and ‘property losses from structure fire per person’
- for road crash rescue events: ‘road death’ rates; and a number of other outcome indicators reported in the road safety section of the police services chapter
- for ambulance events: ‘cardiac arrest survived event’; and ‘level of patient satisfaction’. ‘Cardiac arrest survival to hospital discharge’ and ‘pain management’ are identified as important outcome indicators in the ambulance events framework but data are not yet available for these indicators.

The general performance indicator framework presented in figure 9.1 has been applied to fire events (section 9.3) and road crash rescue events (section 9.4). Ambulance events are based on a different, health-related framework (section 9.5).

The Report’s statistical appendix contains data that may assist in interpreting the performance indicators presented in this chapter. These data cover a range of demographic and geographic characteristics, including age profile, geographic distribution of the population, income levels, education levels, tenure of dwellings and cultural heritage (including Indigenous and ethnic status) (appendix A).

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## 9.3 Fire events

This section contains information on the performance of ESOs in providing emergency management services for fire events. A fire event is an incident that is reported to a fire service organisation and requires a response. Fire events include (but are not limited to):

- structure fires (that is, fires inside a building or structure), regardless of whether there is damage to the structure
- landscape fires, including bushfires and grass fires, regardless of the size of the area burnt
- other fires, including vehicle and other mobile property fires, and outside rubbish fires.

### Emergency management services for fire events

Fire service organisations are the primary agencies involved in providing emergency management services for fire events. A range of other agencies may also be involved, including ambulance service organisations, S/TES, police and community services (table 9A.41).

Full reporting would ideally include information on the resources allocated by all ESOs to managing fire events. Although this information is currently unavailable, work is underway to improve data for future Reports. The descriptive information provided below on funding, incidents and human resources relate to fire service organisations only. (As discussed in section 9.1, fire service organisations are also involved in other activities not directly related to fire events.)

#### *Funding*

Total funding of the fire service organisations covered in this Report was nearly \$2.9 billion in 2009-10. Over the period 2005-06 to 2009-10 funding increased (in real terms) for all jurisdictions except the ACT (table 9.2).

**Table 9.2 Real funding of fire service organisations (2009-10 dollars)  
(\$ million)<sup>a</sup>**

	<i>NSW<sup>b</sup></i>	<i>Vic<sup>c</sup></i>	<i>Qld</i>	<i>WA<sup>d</sup></i>	<i>SA</i>	<i>Tas</i>	<i>ACT<sup>e</sup></i>	<i>NT</i>	<i>Aust</i>
2005-06	775.7	603.3	370.2	157.9	164.0	55.3	60.1	24.3	2 210.9
2006-07	859.7	987.6	381.7	252.9	162.7	59.3	56.0	24.5	2 784.3
2007-08	815.3	806.9	384.5	246.9	176.2	60.6	51.8	20.4	2 562.5
2008-09	902.9	1 218.8	405.9	234.8	176.7	61.1	51.2	24.3	3 075.8
2009-10	916.2	948.6	447.0	248.5	171.6	68.5	52.3	25.8	2 878.5

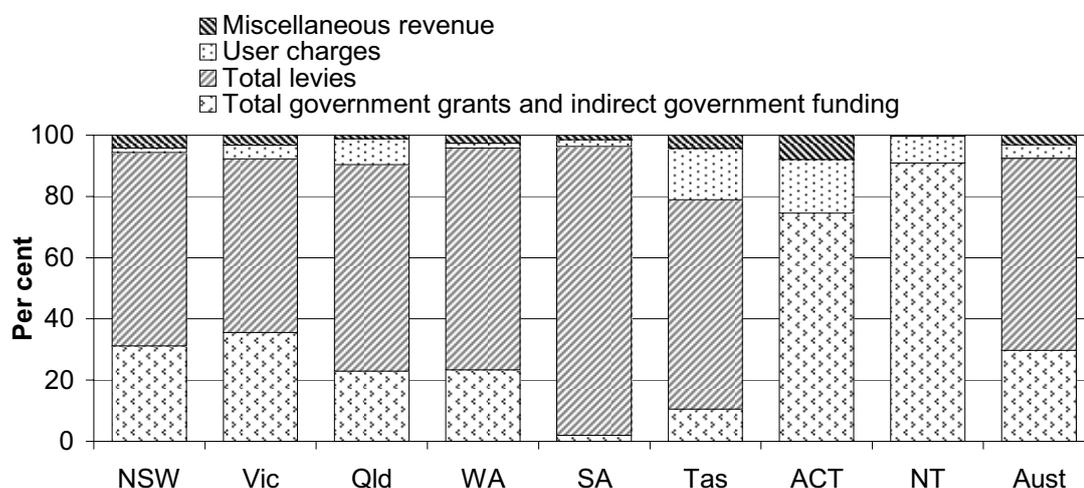
<sup>a</sup> Data are adjusted to 2009-10 dollars using the GDP price deflator (2009-10 = 100) (table AA.26). <sup>b</sup> NSW: Figures vary from year to year as a result of abnormal expenditure related to the response to specific major emergencies. The data for 2009-10 for the first time include data from the Department of Environment, Climate Change and Water. <sup>c</sup> Vic: 2006-07 is the first year which includes revenue for the Department of Sustainability and Environment (DSE) and explains the marked increase for that year. Increase in 2008-09 is due to emergency funding arising from the Black Saturday Bushfires. <sup>d</sup> WA: FESA provides a wide range of emergency services under an integrated management structure. Data for 2006-07 and subsequent years are not segregated by service and include funding related to delivery of other emergency services including SES and volunteer marine rescue. Data for the Department of Environment and Conservation are not included. <sup>e</sup> ACT: The increase in 2005-06 is due to a significant upgrade of Emergency Services Communications systems and inclusion of Joint Emergency Services Training Costs. In 2006-07 funding is included for the placement of an Ericson sky crane in the ACT as part of the National Aerial Firefighting Strategy.

Source: State and Territory governments (unpublished); table 9A.1.

Fire levies were the primary source of funding in 2009-10 in all jurisdictions except the ACT and the NT, where Territory governments were the largest source of funds. Governments usually provide the legislative framework for the imposition of fire levies, rather than directly collecting the levies themselves. In 2009-10, fire levies were raised from levies on property owners or, in some jurisdictions, from levies on both insurance companies and property owners (table 9A.1). In addition to relying on funded resources, all states and territories rely on volunteer firefighters, who make a significant contribution to community safety.

Nationally, 29.8 per cent of funding for fire service organisations was provided by government as government grants and indirect government revenue in 2009-10, a decrease from 37.2 per cent in 2008-09. (The higher levels of government funding in 2008-09 were due to funding directed towards the 2009 Victorian fires). The proportions of funding sources varied across jurisdictions (figure 9.3).

Figure 9.3 **Major sources of fire service organisation revenue, 2009-10 (per cent)**



Source: State and Territory governments (unpublished); table 9A.1.

### *Human resources*

Human resources refers to any person delivering a firefighting or firefighting-related service, or managing the delivery of this service, including:

- firefighters (qualified paid and volunteer firefighters)
- support personnel (any paid person or volunteer directly supporting operational providers, including administrative, technical and communications personnel).

Nationally, 17 278 full time equivalent (FTE) paid personnel were employed by fire service organisations in 2009-10. Nationally, 13 260 FTE or 76.7 per cent of the 17 278 FTE were paid firefighters. A large number of volunteer firefighters (221 848 people) also participated in the delivery of fire services in 2009-10 (table 9A.5).

### *Fires and other emergency incidents*

Various urban and rural fire service organisations operate within jurisdictions (table 9A.37). Complete data on reported fires and other incidents were not available in all jurisdictions.

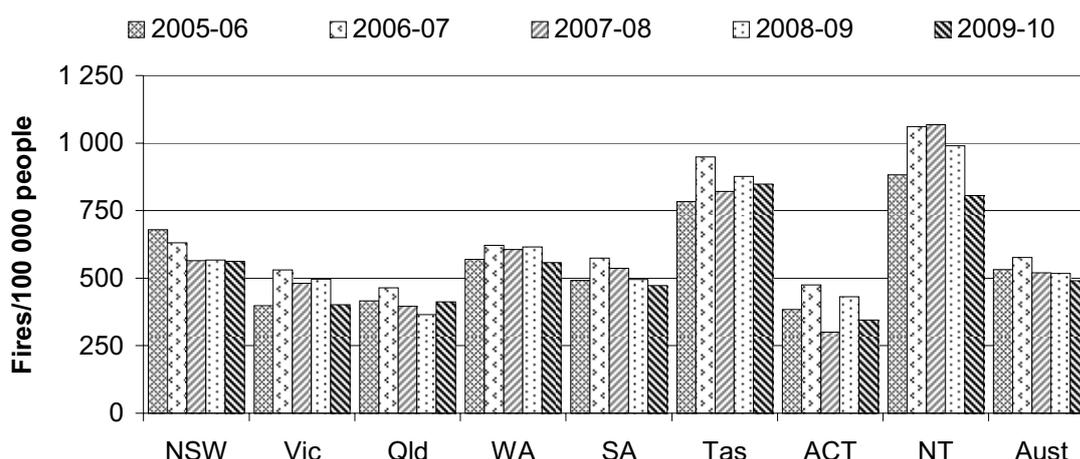
Nationally, 28.7 per cent or 108 675 of the 379 242 reported incidents attended to by fire service organisations were fires, and 70.8 per cent were other emergencies and incidents in 2009-10 (0.5 per cent of incidents were 'not determined or not

classified), with these proportions varying across jurisdictions (table 9A.2). A significant proportion of calls for assistance across all jurisdictions are found, upon investigation, to be false alarms. However, fire service organisations are required by legislation to respond to all calls. An incident cannot be deemed to be a false report until the fire service organisation has responded and investigated the site.

### *Total fire incidents attended by fire service organisations per 100 000 people*

Nationally, 491 fire incidents per 100 000 people were attended in 2009-10, similar to the rate of 518 in 2008-09 (figure 9.4). Rates are more variable across jurisdictions (and within jurisdictions over time) than the national averages.

**Figure 9.4 Fire incidents attended by fire service organisations per 100 000 people<sup>a, b, c, d, e, f, g</sup>**



<sup>a</sup> Qld: Accurate identification of incidents attended by QFRS Rural crews is not possible at this stage due to incomplete voluntary reporting procedures. QFRS Urban stations are estimated to serve 87.6 per cent of Queensland's population. <sup>b</sup> WA: Data include reported turnouts by career and volunteer services to all areas of the State. <sup>c</sup> Tas: Data include *all* fire brigades, both full-time and volunteer. Due to industrial action 90 incident reports are incomplete for 2008-09. <sup>d</sup> ACT: Includes data for urban and rural fire service organisations. <sup>e</sup> NT: The high number of incidents per 100 000 people can be attributed to deliberately lit fires and the large number of grass fires in northern Australia that are caused by the annual growth of vegetation following the wet season. <sup>f</sup> Aust: The average for Australia excludes rural fire service data as per the jurisdictions' caveats. <sup>g</sup> Historical rates in this figure may differ from those in previous Reports. Population data are revised using Final Rebased ERP data following each Census of Population and Housing (the most recent census was 2006). Financial year population estimates are the midpoint estimate of the relevant financial year (that is, as at 31 December).

Source: State and Territory governments (unpublished); table 9A.10.

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### *Ignition factor for structure fires*

Cause identification assists fire service organisations and other emergency management stakeholders to formulate fire prevention, community safety and public education programs. Cause identification also helps formulate legislation and standards, and is used to assist in recovery through the provision of information to facilitate insurance claims and settlements.

The most prevalent ignition factors causing structure fires varies between jurisdictions (table 9A.43). Nationally in 2009-10, the ignition factor for 21.5 per cent of structure fires was ‘undetermined or not reported’. For structure fires where the cause of ignition could be determined, the most significant factors reported were:

- unattended heat sources (15.8 per cent)
- short-circuit, ground fault and other electrical failure (10.3 per cent)
- suspicious (7.7 per cent) (table 9A.43).

### *Total reported landscape fire incidents*

Landscape fire incidents include all vegetation fires, irrespective of the size of the area burnt and can vary substantially in their impact on fire resources, the community and longer term consequences. The number and severity of landscape fires is influenced by many factors, including environmental factors such as weather and climate, with the majority of landscape fires triggered by human activity (AIC 2008).

In early 2009, bushfire devastated Victoria, causing unprecedented loss of life and property (box 9.4).

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#### **Box 9.4 Black Saturday (Victorian fires 2009)**

The Victorian Coroner's Office has confirmed the number of deaths as a result of the fires which directly affected many towns and communities; destroying homes, businesses, schools and kindergartens (Australian Government Disaster Assist 2009). Key statistics are:

- deaths: 173
- area burnt: 430 000 hectares (including 51 towns, 78 communities)
- total property dollar losses: \$1.35 billion
- homes lost: 2129, valued at \$713 million (includes contents and outbuildings).

Rebuilding homes and towns, supporting local economies, regenerating the natural environment and restoring community identity is an enormous task — for government, businesses and the communities. The Victorian and Australian governments have responded to this challenge by establishing the Bushfire Reconstruction and Recovery Authority to coordinate and oversee the rebuilding program.

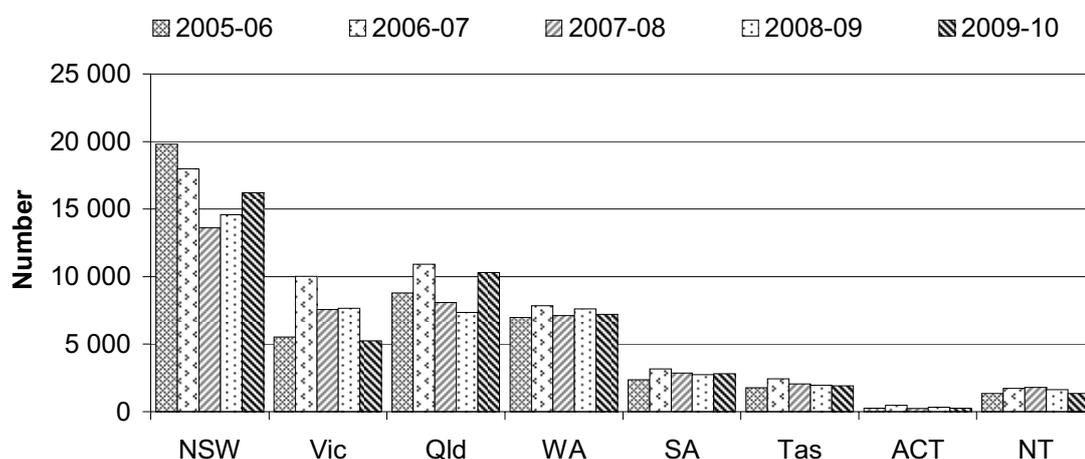
The response to these fires involved cooperation and resources from Australian, State and Territory governments. All of these governments are committed to improving policy and processes as a result of this event and are responding to the findings and recommendations of the Victorian Bushfire Royal Commission.

Nationally, 45 297 landscape (bush and grass) fire incidents were reported by fire service organisations and land management agencies in 2009-10 (table 9A.3).

The consequences of the Black Saturday fire event are reflected in various data (and noted in caveats) and indicators, including increased government funding and expenditure for Victoria in 2008-09. Some data relating to this fire event will not be recognised until future editions of the report due to the lag in reporting (for example fire deaths data will not be reported until the 2012 edition.)

The numbers of reported landscape fire incidents are in figure 9.5. Incidents reported to land management agencies are not included for some jurisdictions. Rates per 100 000 people and by area per 100 000 hectares are provided in attachment table 9A.3.

Figure 9.5 **Fire service organisations and land management agencies reported total landscape (bush and grass) fire incidents<sup>a, b, c, d, e, f, g, h</sup>**



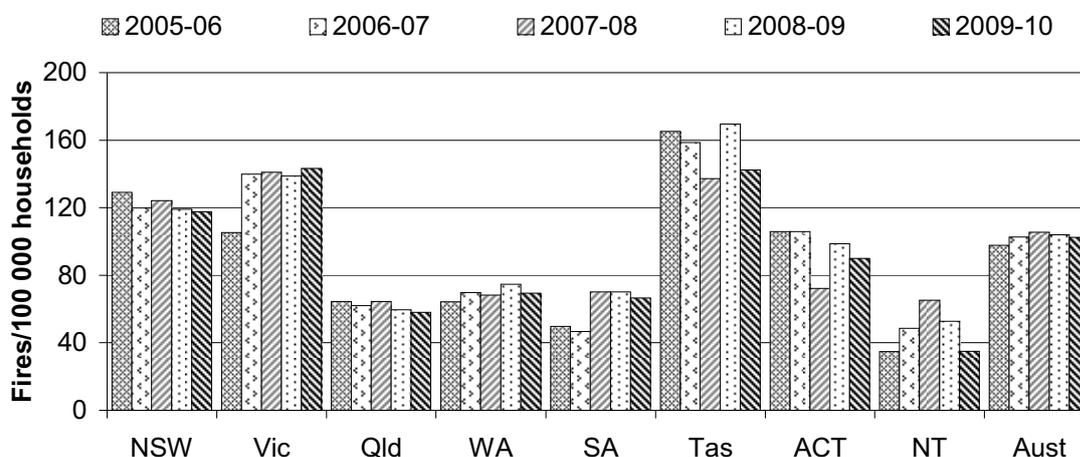
<sup>a</sup> These data may be different to those reported elsewhere because they reflect responses from fire service organisations and, where stated, land management agencies. <sup>b</sup> NSW: Includes data from the NSW Department of Environment and Climate Change, the NSW Rural Fire Service and the NSW Fire Brigades for all bush and grass fires regardless of size of area burnt. <sup>c</sup> Vic: Data include incidents from the Department of Sustainability and Environment. Due to data collection issues, data are incomplete for 2005-06. Black Saturday (Victorian fires 2009) is treated as a single landscape fire event in 2008-09. <sup>d</sup> Qld: Accurate identification of incidents attended by both QFRS Rural crews is not possible at this stage due to incomplete voluntary reporting procedures. <sup>e</sup> WA: Data include landscape fires reported by the Department of Environment and Conservation as a lead agency, with 648 fires recorded for 2008-09. Data include landscape fires reported by the Department of Environment and Conservation as a lead agency, with 603 fires recorded for 2009-10. DEC advised an error in reporting of DEC fires for 2006-07, which have been restated. <sup>f</sup> Tas: Data include all vegetation fires, irrespective of size, from *all* fire brigades (full time and volunteer) and land management agencies. <sup>g</sup> ACT: A 51 per cent decrease in landscape fires from 2006-07 to 2007-08 corresponds to a milder fire season than the previous year. <sup>h</sup> NT: Excludes data from Bushfires NT and some NT Fire and Rescue Service volunteer brigades.

Source: State and Territory governments (unpublished); table 9A.3.

### *Accidental residential structure fires reported to fire service organisations per 100 000 households*

The rate of accidental residential structure fires per 100 000 households is reported in figure 9.6. Rates may not be entirely comparable as the number of accidental residential structure fires is affected by the number of fires where the cause has been determined and classified by fire service personnel. Although the national rate has been relatively constant, rates for jurisdictions show more variability over the five year period.

**Figure 9.6 Accidental residential structure fires reported to fire service organisations<sup>a, b, c, d, e, f, g</sup>**



<sup>a</sup> Rates may not be entirely comparable. The numerator (the number of accidental residential structure fires) is affected by the number of fires where the cause has been determined and classified by fire service personnel. Data for the denominator are from the ABS Australian Demographic Statistics Household projection series and are taken as the average of household data from the start and end of each financial year period to provide a financial year midpoint estimate. For example, household data for the 2008-09 financial year are the average of total households as at 30 June 2008 and as at 30 June 2009. <sup>b</sup> Vic: Due to data collection issues, data are incomplete for 2005-06. <sup>c</sup> Qld: Accurate identification of incidents attended by QFRS Rural crews is not possible at this stage due to incomplete voluntary reporting procedures. QFRS Urban stations are estimated to serve 87.6 per cent of Queensland's population. <sup>d</sup> WA: Data include reported turnouts by career and volunteer services for all areas of the State. <sup>e</sup> SA: Data for 2006-07 may be under reported because MFS data entry was not completed by the submission deadline. <sup>f</sup> Tas: Data include *all* fire brigades, both full-time and volunteer. <sup>g</sup> NT: Data are for NT Fire and Rescue Service permanent fire stations only.

Source: ABS (2010) *Australian Demographic Statistics* Table 21 Projected number of households, states and territories—at 30 June, Cat. no. 3101.0; State and Territory governments (unpublished); table 9A.4.

### *Hazardous materials incidents*

Hazardous materials include paints, adhesives, solvents, fuels, soap, detergents, cosmetics, pharmaceuticals, cleaners, household chemicals, acids, farm and garden chemicals, explosives, industrial chemicals, plastics raw materials, gases and many others. All of these materials have hazardous properties that must be controlled or contained. The materials must be effectively managed and cleaned up in an emergency, when the primary controls have failed.

Australian governments aim to minimise the adverse effects of hazardous materials incidents on the community to enhance public safety. There is increasing community expectation that governments will prevent hazardous materials incidents that threaten community safety and the environment and that fire service

organisations will respond to these incidents with the minimum possible further impact on the environment.

Fire service organisations provide ‘Hazmat’ (hazardous material) services that contribute to achieving enhanced community safety and quality of life, business confidence and protection of the environment by:

- influencing government policy and legislation to ensure integration of prevention and response activities
- effective planning, prevention, safe response and recovery from incidents.

The prevention/mitigation, preparedness, response and recovery services provided and delivered by fire service organisations for hazardous materials incidents have the potential to avoid the need for downstream services. The use of downstream services may be undesirable because it reflects negative outcomes and/or involves significant social costs.

Nationally, fire service organisations responded to 2758 hazardous materials incidents in 2009-10 (table 9.3).

**Table 9.3 Number of hazardous materials incidents attended to by fire service organisations<sup>a, b, c, d, e</sup>**

	<i>NSW</i>	<i>Vic</i>	<i>Qld<sup>d</sup></i>	<i>WA</i>	<i>SA<sup>a</sup></i>	<i>Tas</i>	<i>ACT<sup>a</sup></i>	<i>NT</i>	<i>Aust</i>
2005-06	848	1 245	288	84	1 116	30	62	238	3 911
2006-07	971	1 637	324	94	1 077	36	127	164	4 430
2007-08	777	1 448	415	87	180	26	179	90	3 202
2008-09	911	910	430	70	466	31	130	184	3 132
2009-10	854	970	319	101	164	46	129	175	2 758

<sup>a</sup> Data may differ from those in table 9A.2 which include fires involving or releasing hazardous materials. Data also exclude minor fuel or other flammable liquid spills/leaks less than 200 litres except for SA for 2003-04 to 2006-07 and the ACT for all years. <sup>b</sup> Data represent incidents attended by FSOs. FSOs may not be notified of all hazardous materials incidents occurring in the community. <sup>c</sup> Coding of hazardous materials incidents is based on the judgment of the reporting fire officer shortly after the time of the incident. Some coding of incidents may be inaccurate due to the information available at the time of reporting. <sup>d</sup> Qld: Reporting of incident attendance by QFRS Rural Crews is incomplete due to voluntary reporting procedures. <sup>e</sup> Changes to hazardous materials incident reporting were accepted and ratified by the AFAC SIMSG in November 2005 for implementation from July 1 2006. However, each fire service may have implemented these changes at different times, with implementation complete in the 2009-10 year.

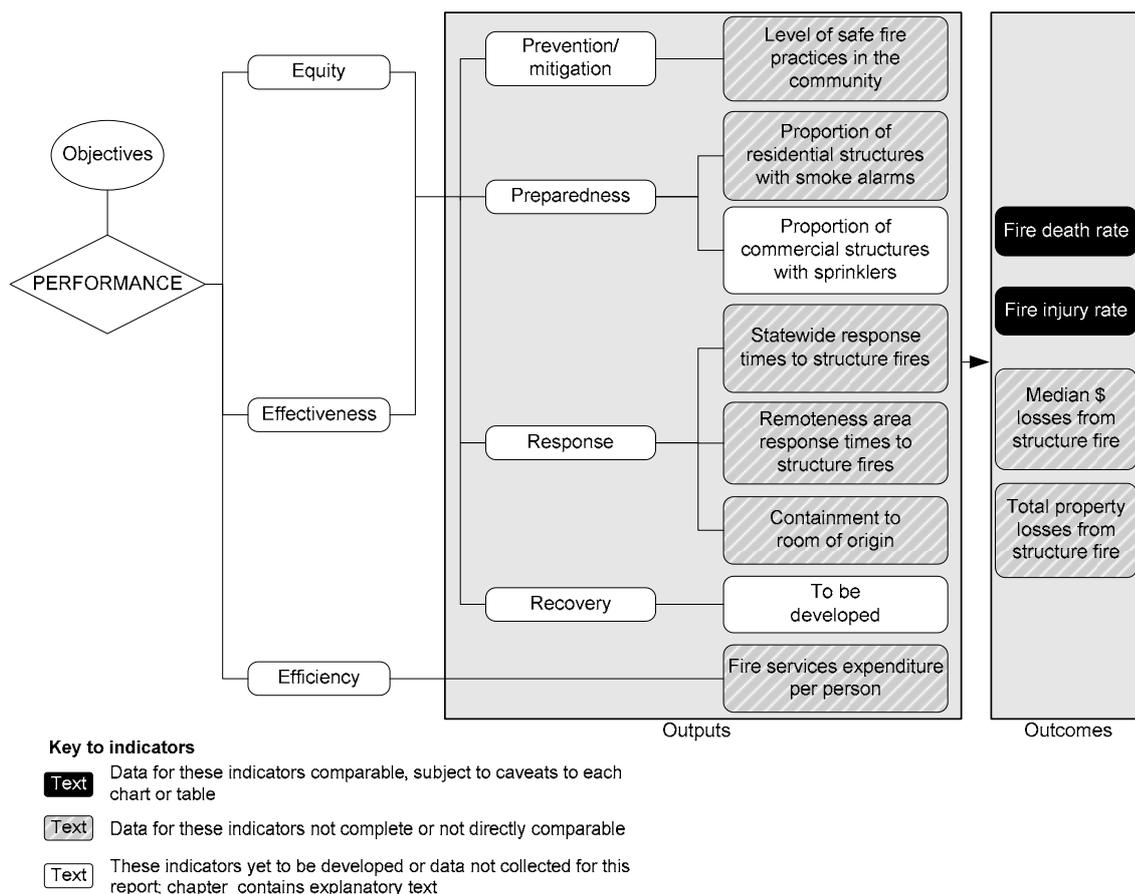
Source: State and Territory governments (unpublished).

In addition to fire service organisations, other agencies and organisations contribute to the emergency management and risk management of hazardous materials incidents. Different arrangements exist across jurisdictions (table 9A.42).

## Framework of performance indicators

Figure 9.7 presents the performance indicator framework for fire events, based on the general framework for all emergency events. Definitions of all indicators are provided in section 9.8.

Figure 9.7 Performance indicators for fire events



The performance indicator framework for fire events shows which data are comparable in the 2011 Report. For all data, supporting text and footnotes include caveats relevant to interpretation. Indicators that are considered comparable are only comparable subject to accompanying caveats. Chapter 1 discusses data comparability from a Report wide perspective (see section 1.6).

Performance information is reported for a number of indicators. These results might have been influenced by factors such as differences in climatic and weather conditions, the socio-demographic and topographic composition of jurisdictions, property values and dwelling construction types. Importantly, jurisdictions also have diverse legislative fire protection requirements.

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Results need to be interpreted with care because data might have been derived from small samples (for example, jurisdictions' fire safety measures surveys) or may be highly variable as a result of relatively small populations (as in Tasmania, the ACT and the NT).

The role of volunteers also needs to be considered when interpreting some indicators (such as fire service organisation expenditure per person). Volunteer personnel provide a substantial proportion of fire services (and emergency services more generally). While costs such as the training and equipment associated with volunteers are included in the cost of fire service provision, the labour costs of providing fire services would be much greater without volunteers (assuming these functions were still performed).

Information has not been reported for all fire events in each jurisdiction consistently over time. Reported results sometimes exclude rural fire events, so performance data are not always directly comparable across jurisdictions. Fire service organisations are cooperating to improve the standards for the collection of fire events data, which is evident by the inclusion of rural fire service organisations data by more jurisdictions in recent years. Differences in counting rules are expected to be minimised in future Reports.

## **Key performance indicator results**

### *Outputs*

Outputs are the services delivered (while outcomes are the impact of these services on the status of an individual or group) (see chapter 1, section 1.5). Outputs are measured by the 'level of safe fire practices in the community'; 'the proportion of residential structures with smoke alarms'; 'the proportion of commercial structures with sprinklers'; 'response times to structure fires'; 'containment to the room of origin'; and 'expenditure per person'.

### *Equity and effectiveness — prevention/mitigation*

Equity and effectiveness indicators are linked for fire events. The equity dimension of prevention/mitigation indicators relates to whether specific parts of the community with special needs or difficulties in accessing government services benefit from fire services' activities. The effectiveness dimension of prevention/mitigation indicators relates to fire service organisations' ability to prevent fires and mitigate fire damage.

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### *Level of safe fire practices in the community*

'Level of safe fire practices in the community' is an indicator of governments' objective to reduce the adverse effects of fires on the community and manage the risk of fires (box 9.5).

#### **Box 9.5 Level of safe fire practices in the community**

'Level of safe fire practices in the community' is defined as the number of households with household fire safety measures installed or prevention procedures followed, divided by the total number of households.

The higher the proportion of households with a fire safety measure installed or prevention measure followed, the less likely fires will occur or cause excessive damage. This indicator does not provide information on the degree to which practices under consideration contribute to fire prevention and mitigation.

Comparable data for this indicator were last reported by the ABS in 2001 (for the reference period February to November 2000). Since then data have been available inconsistently from various sources and are not directly comparable.

Selected fire risk management/mitigation strategies across jurisdictions are identified in table 9A.35. Nationally consistent data on household fire safety measures installed or prevention procedures followed have not been available since the ABS Population Survey Monitor (PSM) (ABS 2001) was discontinued (in November 2001). Since then, some jurisdictions have conducted their own surveys of household fire safety measures installed or prevention procedures followed. These surveys have focused on local priorities, for example, where there are already high levels of reported smoke alarms in homes, surveys may target other fire safety practices or measures. Different survey methodologies have also been used across jurisdictions. Such methodological differences between the surveys undertaken by the jurisdictions mean that nationally consistent data are not currently available.

### *Equity and effectiveness — preparedness*

The equity dimension of preparedness indicators relates to whether specific parts of the community with special needs or difficulties in accessing government services benefit from fire services' activities. The effectiveness dimension of preparedness indicators relates to fire service organisations' ability to prepare, and assist the community to prepare, for fire events.

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*Proportion of residential structures with smoke alarms*

The proportion of residential structures with smoke alarms is an indicator of governments' objective to reduce the adverse effects of fire on the community through preparedness measures (box 9.6).

**Box 9.6 Proportion of residential structures with smoke alarms**

'Proportion of residential structures with smoke alarms' is defined as the number of households with a smoke alarm installed, divided by the total number of households.

The higher the proportion of households with a smoke alarm installed, the greater is the likelihood that the adverse effects of fire will be avoided or reduced.

Data reported for this indicator are not complete and not directly comparable.

Current nationally comparable and complete time series data are not available on the proportion of residential structures with smoke alarms. Nationally consistent data for all jurisdictions were last available for the reference period February to November 2000, from the discontinued ABS PSM. Where available, subsequent data suggest increasing percentages of households have installed a smoke alarm/detector (table 9A.12). However, as these data are sourced from various jurisdictional collections they are not strictly comparable.

The most recent cross-sectional, nationally consistent data available relevant to the preparedness aspect of 'level of safe fire practices in the community' are for four jurisdictions on a variety of safety precautions (NSW, Victoria, Queensland and the ACT), for October 2007 (table 9A.11). Results indicated that across those four jurisdictions more than 90 per cent of households had smoke alarms (ABS 2008a). Related data for the same time period are available for WA (ABS 2008b).

*Proportion of commercial structures with sprinklers*

'Proportion of commercial structures with sprinklers' is an indicator of governments' objective to prevent the adverse effects of fire on the community through preparedness measures (box 9.7).

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### **Box 9.7 Proportion of commercial structures with sprinklers**

'Proportion of commercial structures with sprinklers' is defined as the number of commercial structures with sprinklers installed, divided by the total number of commercial structures.

The higher the proportion of commercial structures with sprinklers installed, the greater is the likelihood that the adverse effects of fire are reduced. This indicator will not provide information on the operational status of sprinkler systems or their contribution to fire prevention.

Nationally comparable data are not available for this indicator.

### *Equity and effectiveness — response*

The equity dimension of response indicators relates to whether specific parts of the community with special needs or difficulties in accessing government services benefit from fire services' activities. The effectiveness dimension of response indicators relates to fire service organisations' ability to respond to and suppress fires.

### *Statewide, and remoteness area, response times to structure fires*

'Statewide response times to structure fires' and 'remoteness area response times to structure fires' are indicators of governments' objective to reduce the adverse effects of fire on the community through timely response activities (box 9.8).

### **Box 9.8 Statewide and remoteness area response times to structure fires**

Statewide and remoteness area response times are defined as the times within which 50 per cent and 90 per cent of structure fires are responded to, measured by when the first fire appliance arrives at the scene.

Structure fires are those fires in housing and other buildings. The response time is defined as the interval between the receipt of the call at the communications centre and the arrival of the first appliance at the scene (that is, when the vehicle is stationary and the handbrake is applied). This and other intervals are illustrated in figure 9.7.

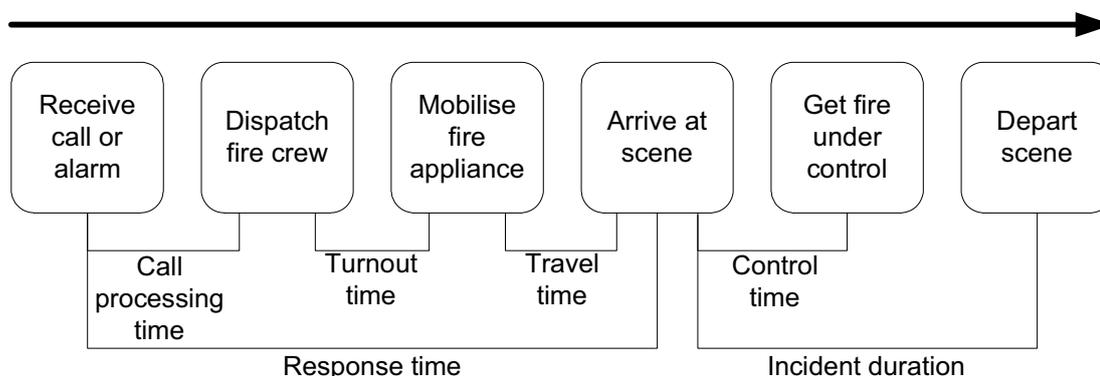
Percentile calculations are based on emergency responses to structure fire incidents and include responses by both permanent and volunteer brigades (unless otherwise noted in jurisdictions' caveats).

Shorter response times suggest the adverse effects on the community of emergencies requiring fire services are reduced. Data reported for this indicator are not directly comparable.

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Figure 9.8 **Response time points and indicators for fire events**

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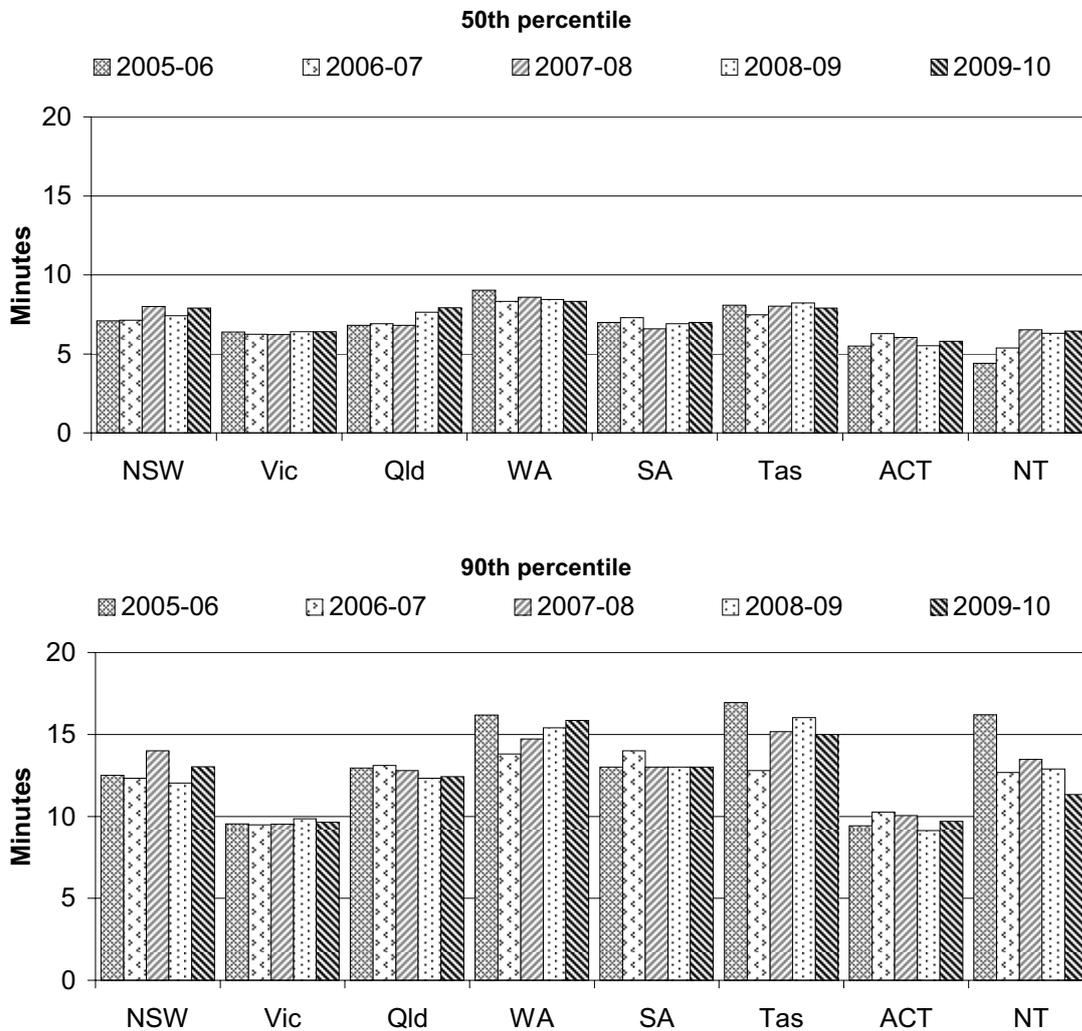
Response times need to be interpreted with caution because the data are not strictly comparable across jurisdictions. There are many factors that influence response times including:

- land area, and population size and density
- topography, road/transport infrastructure and traffic densities
- crewing configurations, response systems and processes, and travel distances.

In addition, reported response times can be affected by data collection systems. Jurisdictions use a combination of computer aided dispatch (CAD) and manual systems. The majority of data are retrieved from CAD systems, with manual systems providing approximately 10 per cent of data across all jurisdictions.

Response times vary between jurisdictions (figure 9.9).

Figure 9.9 Response times to structure fires, state-wide<sup>a, b, c</sup>

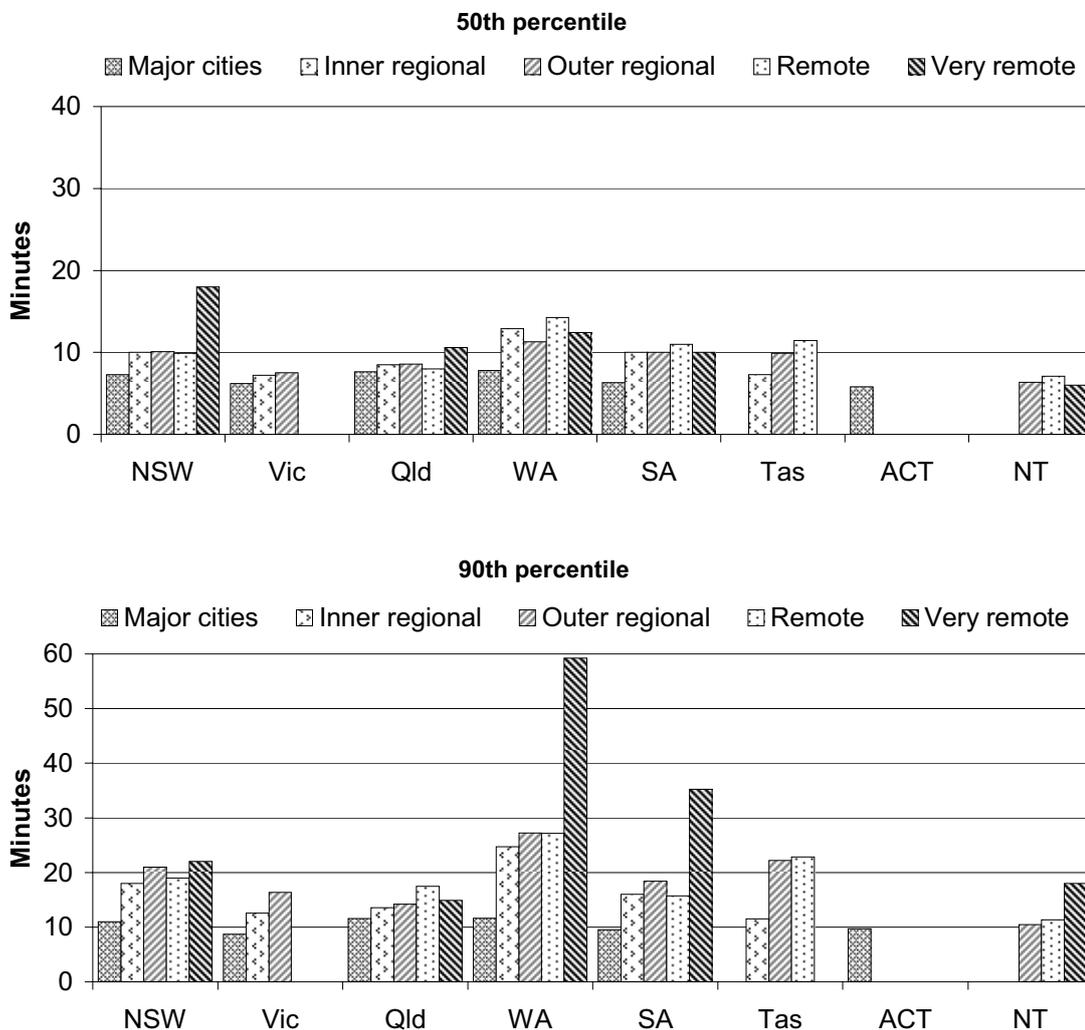


<sup>a</sup> Differences between jurisdictions in definitions of response times, geography, personnel mix, and system type (manual or CAD), affect the comparability of response times data. Data with incomplete time details are excluded from percentile calculations. <sup>b</sup> Qld: In 2008-09, 90 incidents were unable to be classified by remoteness and were removed from the calculations. Response times for QFRS Rural brigade crews are not included because response times are not accurately recorded. Only primary exposure incidents are included. <sup>c</sup> WA: Data include both career and volunteer responses where the response was provided under emergency conditions (lights and sirens). Incidents where response time information is incomplete are excluded from response time calculations. Response times for major cities, regional and remote areas are impacted by volunteer data that, particularly in remote areas of the state are affected by significant travel time to incidents.

Source: State and Territory governments (unpublished); table 9A.13.

Response times can be segmented into remoteness areas based on the ABS Australian Standard Geographical Classification (figure 9.10).

Figure 9.10 **Response times to structure fires, by remoteness area, 2009-10<sup>a, b, c, d, e, f, g, h</sup>**



<sup>a</sup> Differences between jurisdictions in definitions of response times, geography, personnel mix, and system type (manual or CAD), affect the comparability of response times data. For some jurisdictions, certain remoteness areas do not exist (e.g very remote in the ACT) or data are not available. Data with incomplete time details are excluded from percentile calculations. <sup>b</sup> Vic: There are no very remote areas in Victoria. <sup>c</sup> Qld: In 2009-10, two incidents were unable to be classified by remoteness and have been removed from calculations. In 2008-09, 90 incidents were unable to be classified by remoteness and were removed from the calculations. Response times for QFRS Rural brigade crews are not included because response times are not accurately recorded. Only primary exposure incidents are included. <sup>d</sup> WA: Data include both career and volunteer responses where the response was provided under emergency conditions (lights and sirens). Incidents where response time information is incomplete are excluded from response time calculations. Response times for major cities, regional and remote areas are impacted by volunteer data that, particularly in remote areas of the state are affected by significant travel time to incidents. <sup>e</sup> SA: The Country Fire Service and the Metropolitan Fire Service do not have geocoded data. SA data include incident records with both alarm and arrival times. Excludes response times of 12 hours or more. The high 90<sup>th</sup> percentile result for the 'very remote' category is due to the small number of reported fires, with some fires having response time of 1 to 3 hours. <sup>g</sup> ACT: All responses were within the major city. <sup>h</sup> NT: NT Fire and Rescue Services respond to structure fires outside gazetted Emergency Response Areas in the NT when required impacting on some response times.

Source: State and Territory governments (unpublished); table 9A.14.

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### *Containment to room of origin*

‘Containment to room of origin’ is an indicator of governments’ objective to reduce the adverse effects of fire emergency events on the community by response and mitigation strategies (box 9.9).

#### **Box 9.9    Containment to room of origin**

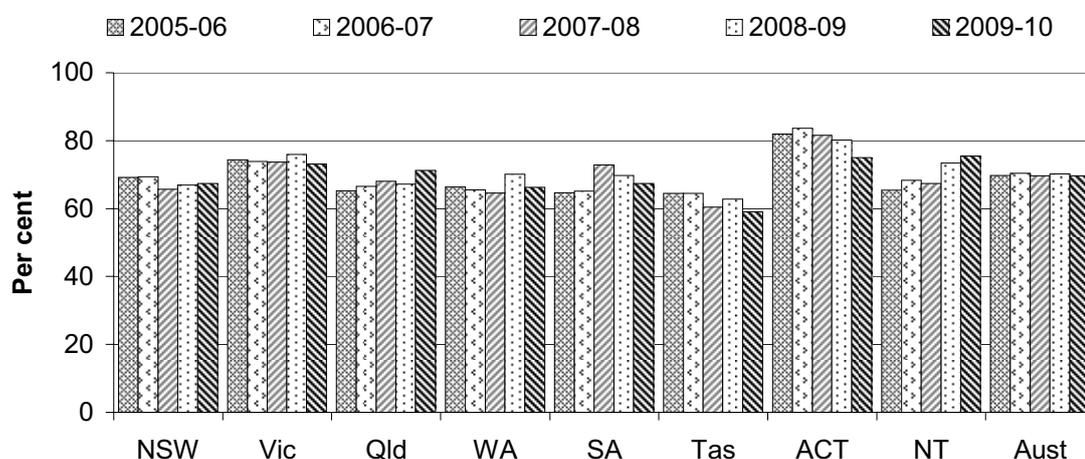
‘Containment to room of origin’ is defined as the number of structure fires contained to the object or room of origin divided by the total number of structure fires. Structure fires are those fires in housing and other buildings.

A higher proportion of structure fires contained to the object or room of origin is more desirable.

Data reported for this indicator are not directly comparable.

The proportion of fires, from all ignition types, contained to the object or room of origin varies between jurisdictions, and within jurisdictions over time (figure 9.11).

Figure 9.11 **Structure fires (all ignition types) contained to the object/room of origin<sup>a, b, c, d, e, f, g</sup>**



<sup>a</sup> NSW: The decline in the percentage of structure fires confined to the object or room of origin between 2006-07 and 2007-08 is artificial. The data for 2007-08 for the first time conform to the nationally agreed definition for this measure by including data from both the NSW RFS and the NSWFB. <sup>b</sup> Vic: Data are incomplete for 2005-06. <sup>c</sup> Qld: QFRS Rural Incident Database does not currently record the necessary information to calculate this measure. Structure fires within the Urban Levy Boundary are included, excluded are non-emergency calls and those where QFRS experienced delays due to either extreme weather conditions or where the initial response was by another agency or brigade. <sup>d</sup> WA: Incidents where containment codes are not completed, and where the fire only affects the outside of a structure are excluded from containment calculations. Confinement results in this report are based on different counting rules to those published in FESA's annual report. FESA excludes all incidents where no damage is reported and includes small fires confined to non-combustible containers, which are excluded in RoGS. The inclusion of these data fires increases FESA's 2009-10 result from 66.3 to 76.4 per cent. <sup>e</sup> SA: Data exclude the Country Fire Service. <sup>f</sup> Tas: Data are for *all* fire brigades, both full-time and volunteer. <sup>g</sup> Aust: Average excludes rural fire service data for some years as per the jurisdictions' caveats.

Source: State and Territory governments (unpublished); table 9A.15.

Nationally in 2009-10, the proportion of incendiary and suspicious structure fires contained to the object or room of origin was 56.1 per cent and for accidental structure fires 80.4 per cent. Nationally, rates have shown little movement over the 5 years to 2009-10. However, trends in individual jurisdictions' rates have varied (table 9A.15).

### *Equity and effectiveness — recovery*

The equity dimension of recovery indicators relates to whether specific parts of the community with special needs or difficulties in accessing government services benefit from recovery strategies, services and activities. The effectiveness dimension of recovery indicators relates to community restoration, and to communities' and fire service organisations' ability to return to a state of preparedness (box 9.10).

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**Box 9.10 Performance indicators — recovery**

There are two elements to recovery: supporting communities in reconstruction of the physical infrastructure and restoration of emotional, social, economic, ecological and physical wellbeing following a fire event, and return of communities and fire service organisations to a state of preparedness after experiencing a fire event.

Recovery indicators are identified as a key development area for future Reports.

### *Efficiency*

#### *Fire service organisations' expenditure per person*

'Fire service organisations' expenditure per person' is a proxy indicator of the efficiency of governments in delivering emergency management services (box 9.11).

**Box 9.11 Fire service organisations' expenditure per person**

'Fire service organisations' expenditure per person' is defined as total fire service organisation expenditure per person in the population.

All else being equal, lower expenditure per person represents greater efficiency. However, efficiency data are difficult to interpret. While high or increasing expenditure per person may reflect deteriorating efficiency, it may also reflect changes in aspects of the service (such as improved response) or the characteristics of fire events (such as more challenging fires). Similarly, low or declining expenditure per person may reflect improving efficiency or lower quality (response times) or less challenging fires.

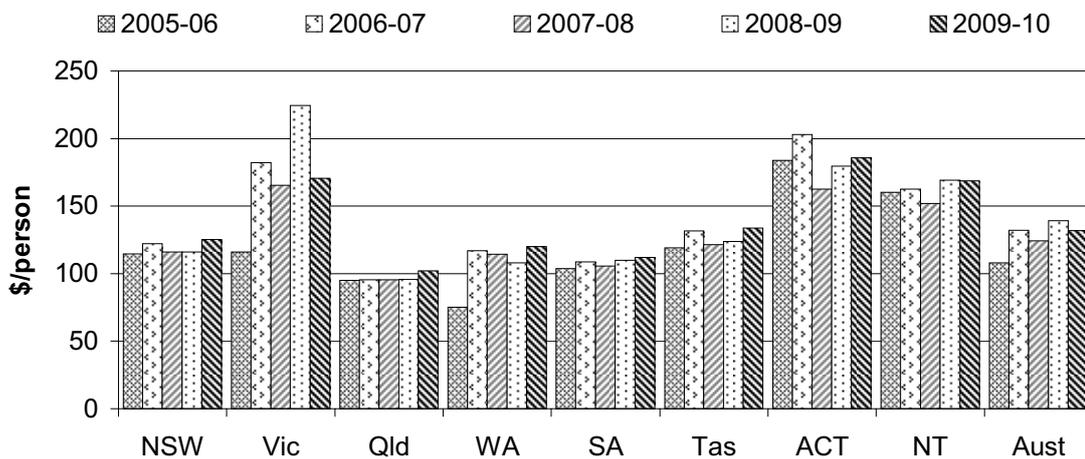
Expenditure per person is employed as a proxy for efficiency. Expenditure per fire is not used as a proxy for fire service organisation efficiency because an organisation that applies more resources to the prevention and preparedness components to reduce the number of fire incidents could erroneously appear to be less efficient.

Data reported for this indicator are not directly comparable.

Both total cost of fire service organisations and the cost to government of funding fire service organisations are reported. Both are reported, because revenue from other sources is significant for a number of jurisdictions.

Nationally, the total expenditure on fire service organisations per person in 2009-10 was approximately \$132 (figure 9.12).

**Figure 9.12 Fire service organisations expenditure per person (2009-10 dollars)<sup>a, b, c, d, e, f</sup>**

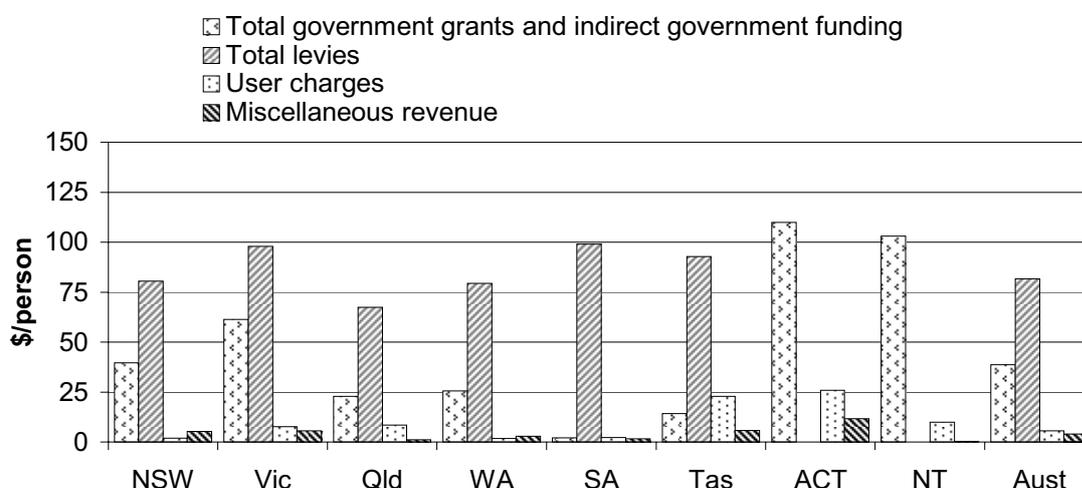


<sup>a</sup> Data are adjusted to 2009-10 dollars using the GDP price deflator (2009-10 = 100) (table AA.26). Due to differences in definitions and counting rules, data reported may differ from those in agency annual reports and other sources. Total fire expenditure includes levies on insurance companies and property owners, user charges, fundraising and donations and indirect revenue. <sup>b</sup> Historical rates in this figure may differ from those in previous Reports. Population data are revised using Final Rebased ERP data following each Census of Population and Housing (the most recent census was 2006). Financial year population estimates are the midpoint estimate of the relevant financial year (that is, as at 31 December). <sup>c</sup> Vic: 2006-07 is the first year in which the Victorian data includes expenditure for the Department of Sustainability and Environment (DSE) and explains the marked increase for that year. 2008-09 data include a significant increase in expenditure due to emergency funding arising from the Black Saturday Bushfires. <sup>d</sup> WA: FESA provides a wide range of emergency services under an integrated management structure. Data for 2006-07 and subsequent years cannot be segregated by service and include SES and volunteer marine services as well as fire. Data for the Department of Environment and Conservation are not included. <sup>e</sup> ACT: 2005-06 expenditure includes a significant upgrade of Emergency Services Communications systems and inclusion of Joint Emergency Services Training Costs. 2006-07 expenditure includes placement of an Ericson sky crane in the ACT as part of the National Aerial Firefighting Strategy. <sup>f</sup> Qld: Expenditure in 2009-10 included costs of \$6.8 million associated with the Natural Disaster Relief and Recovery Arrangements declared bushfire event in September-October 2009.

Source: State and Territory governments (unpublished); table 9A.17.

Nationally, total government grants and indirect government funding of fire service organisations per person in 2009-10 was \$38.65. Levies per person in 2009-10 averaged \$81.58 nationally, with relatively minor contributions from user charges and miscellaneous revenue (table 9A.18). The major sources of funding varied considerably across jurisdictions (figure 9.13).

**Figure 9.13 Fire service organisation funding per person, 2009-10<sup>a, b, c</sup>**



<sup>a</sup> Some jurisdictions do not obtain funds from all four funding sources identified in the figure. <sup>b</sup> Qld: Revenue in 2009-10 included income of \$6.8 million associated with the National Disaster Relief and Recovery Arrangements declared bushfire event in September-October 2009. <sup>c</sup> NSW: The data for 2009-10 for the first time include data from the Department of Environment, Climate Change and Water.

Source: State and Territory governments (unpublished); table 9A.18.

## Outcomes

Outcomes are the impact of services on the status of an individual or group (while outputs are the services delivered) (chapter 1, section 1.5). These outcome indicators: ‘fire death rate’, ‘fire injury rate’, ‘median dollar losses from structure fire’ and ‘property losses from structure fire per person’, relate to the objective of ESOs to minimise the effect of fire on life, property and the environment. Caution should be exercised in interpreting data for some indicators, given the significant fluctuations from year to year, particularly for jurisdictions with relatively small populations.

## Fire death rate

‘Fire death rate’ is an indicator of governments’ objective to minimise the adverse effects of fire events on the community and enhance public safety (box 9.12).

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**Box 9.12 Fire death rate**

'Fire death rate' is defined as the number of fire deaths per million people.

A low or decreasing fire death rate represents a better outcome.

Fire deaths are identified from cause of death information supplied by the medical practitioner certifying the death or by a coroner. Fire deaths are reported by year of registration of death at State and Territory Registrars of Births, Deaths and Marriages.

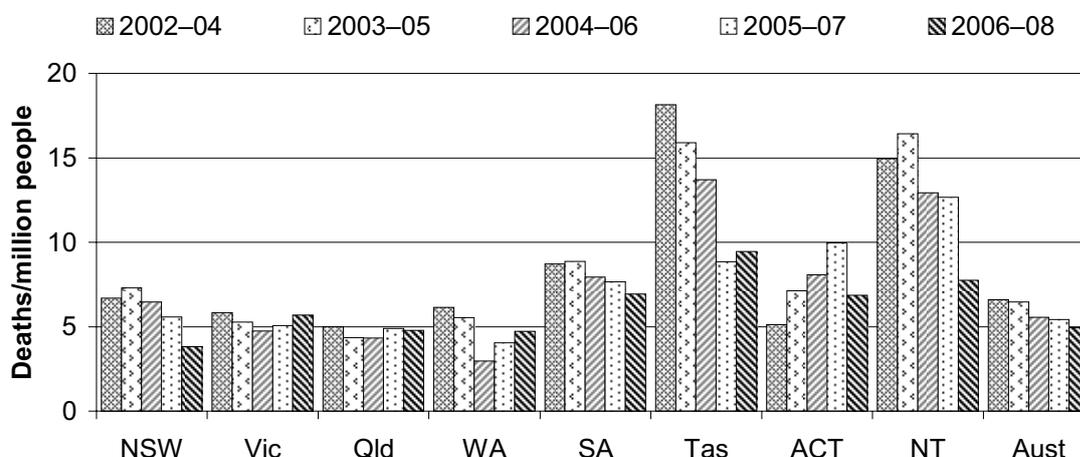
Data reported for this indicator are comparable. Latest data available are for 2008.

Data quality information for this indicator is at [www.pc.gov.au/gsp/reports/rogs/2011](http://www.pc.gov.au/gsp/reports/rogs/2011)

Nationally, there were 112 fire deaths in 2008. Exposure to smoke, fire and flames accounted for 72 deaths, 19 fire deaths occurred from intentional self-harm by smoke, fire and flames and 4 deaths were due to assault by smoke, fire and flames. The remaining fire deaths were of undetermined intent (table 9A.6). The fire death rate was 5.2 deaths per million people in 2008.

Fire deaths data are volatile over time, because of the small number of fire deaths. To overcome data volatility, a three year weighted average fire death rate is reported (figure 9.14).

**Figure 9.14 Annual fire death rate, three year rolling average<sup>a, b, c, d, e</sup>**



<sup>a</sup> Fire deaths data may differ slightly from those published in earlier reports due to ABS revisions incorporated in the 2011 Report. Cells in table 9A.6 have been randomly adjusted to avoid the release of confidential data. Where necessary, totals have been adjusted separately to the component cells and totals are not necessarily the sum of the component cells. <sup>b</sup> Fire deaths are coded to the ICD and Related Health Problems Revision 10 (ICD-10) and include ICD fire death codes X00-X09 plus X76, X97 and Y26. Fire deaths data are reported by the State or Territory of the deceased's usual residence, and by the year the death was registered. <sup>c</sup> The small number of deaths means it is difficult to establish patterns and provide detailed analysis. <sup>d</sup> Australian totals include Other Territories. <sup>e</sup> Historical rates in this figure may differ from those in previous Reports. Population data are revised using Final Rebased ERP data following each Census of Population and Housing (the most recent census was 2006). Calendar year population estimates are the midpoint estimate of the relevant calendar year (that is, as at 30 June).

Source: ABS (various years) *Causes of Death, Australia*, Cat. no. 3303.0 (unpublished); table 9A.6.

Nationally, the three year weighted average fire death rate shows a small but steady decline since 2002, with a rate of 4.9 deaths per million people for 2006–08.

### *Fire injury rate*

'Fire injury rate' is an indicator of governments' objective to minimise the adverse effects of fire events on the community and enhance public safety (box 9.13).

### Box 9.13 Fire injury rate

'Fire injury rate' is defined as the number of fire injuries per 100 000 people.

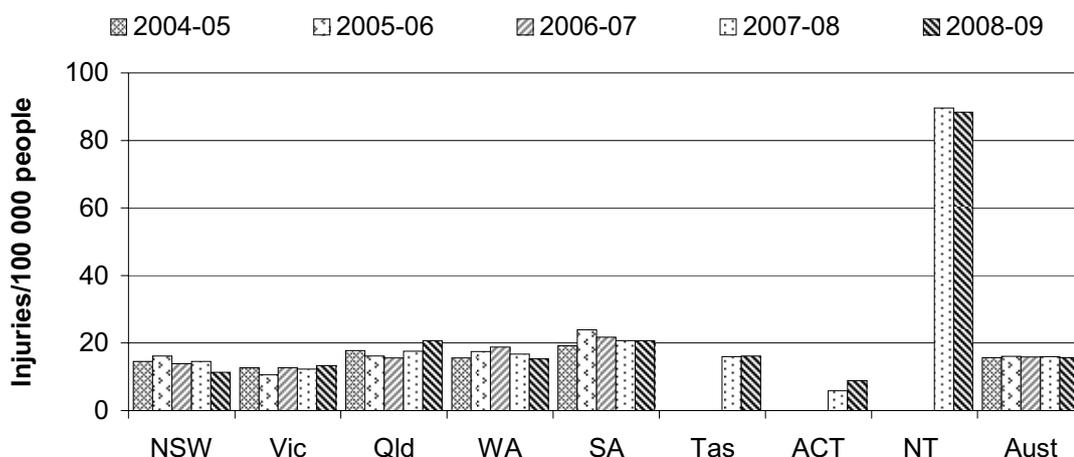
A lower fire injury rate represents a better outcome.

Fire injuries are represented by hospital admissions (excluding emergency department non-admitted casualties) and are reported by the State or Territory where the admission occurs. A person injured by fire may be treated more than once, and in more than one State or Territory. Deaths from fire injuries after hospitalisation have been removed from the fire injuries data for the time series because these are counted in the fire death rate.

Data reported for this indicator are comparable. Latest available data are for 2008-09.

Nationally in 2008-09, there were 3390 hospital admissions due to fire injury (table 9A.7) and the rate per 100 000 people was 15.7 (figure 9.15).

Figure 9.15 Annual fire injury rate<sup>a, b, c</sup>



<sup>a</sup> Fire injuries are coded to the ICD and Related Health Problems Revision 10 (ICD-10) and include ICD fire injury codes X00-X09 plus X76, X97 and Y26. Fire injuries are reported by the State or Territory where the injury is treated. Excludes secondary fires resulting from explosions, transport incidents, and emergency department non-admitted casualties. <sup>b</sup> Tas, ACT and NT: Data for 2003-04 to 2006-07 are not available.

<sup>c</sup> Historical rates in this figure may differ from those in previous Reports. Population data are revised using Final Rebased ERP data following each Census of Population and Housing (the most recent census was 2006). Financial year population estimates are the midpoint estimate of the relevant financial year (that is, as at 31 December).

Source: Australian Institute of Health and Welfare (AIHW), *National Hospital Morbidity Database* (unpublished); table 9A.7.

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Fire injury rates are volatile over time, given the small number of fire injuries. To overcome data volatility, three year weighted average fire injury rates are reported in the data attachment table for periods and jurisdictions with published data (table 9A.7).

### *Losses from structure fire*

‘Median dollar losses from structure fire’ (box 9.14) and ‘property loss from structure fire per person’ (box 9.15) are indicators of the effect of fire on property.

#### **Box 9.14 Median dollar losses from structure fire**

‘Median dollar losses from structure fire’ is defined as the median dollar losses from structure fire (a fire in a house or other building), adjusted for inflation. The median is the middle number in a sequence and is regarded as a more appropriate measure of ‘typical’ losses than the average (or mean) loss.

Lower or decreasing median dollar losses represent a better outcome.

Data reported for this indicator are not directly comparable.

#### **Box 9.15 Property losses from structure fire per person**

‘Property losses from structure fire per person’ is defined as the property loss from structure fire (a fire in housing or other building) per person, adjusted for inflation.

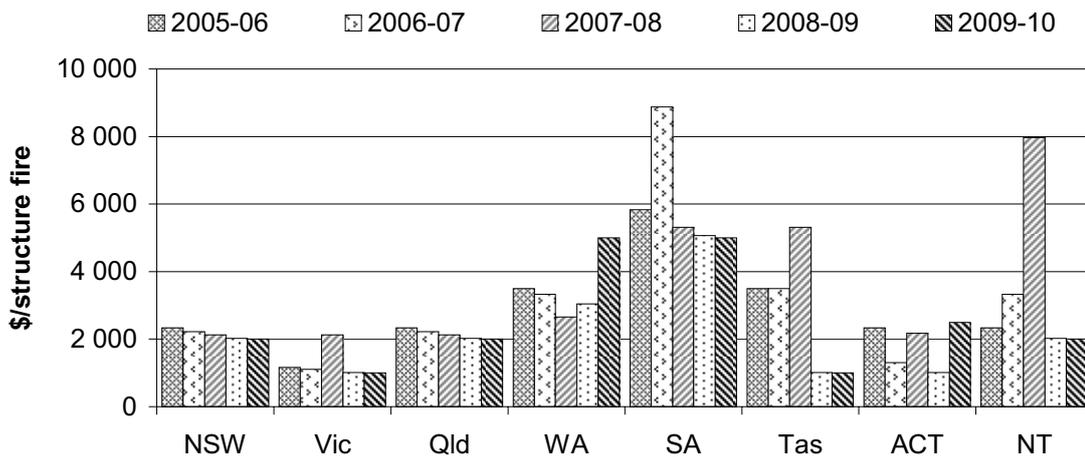
Lower or decreasing total property losses from structure fire per person represent better outcomes.

Data reported for this indicator are not directly comparable.

These data (expressed in real terms) have not been adjusted for jurisdictional differences in the costs and values of various types of building. Further, the method of valuing property loss from fire varies across jurisdictions.

The median dollar loss varies across jurisdictions and over time. No clear national trends are evident (figure 9.16).

Figure 9.16 **Median dollar loss per structure fire (2009-10 dollars)<sup>a, b, c, d, e, f</sup>**



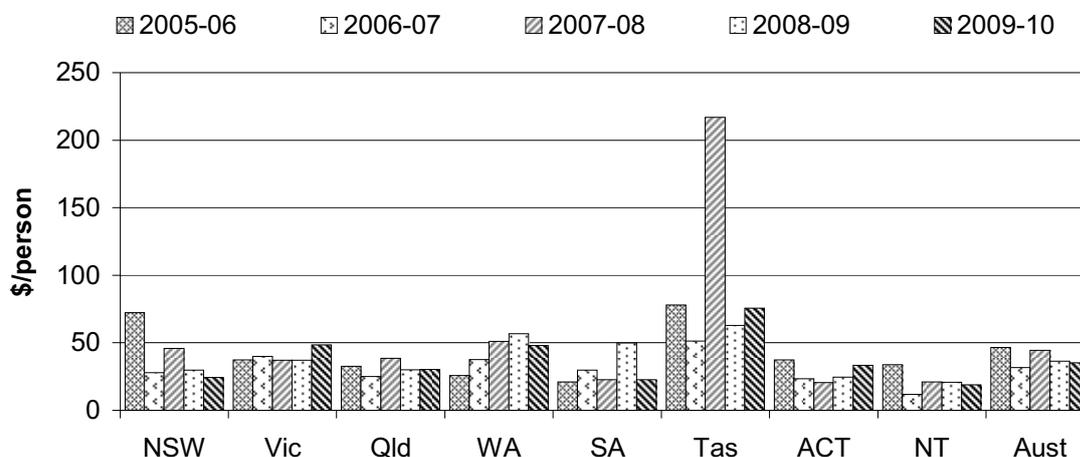
<sup>a</sup> Data are adjusted to 2009-10 dollars using the GDP price deflator (2009-10 = 100) (table AA.26). Estimates have not been validated by the insurance industry, or adjusted for interstate valuation differences. <sup>b</sup> Vic: Due to data collection issues, data are incomplete for 2005-06. 2008-09 data do not include loss arising from the Black Saturday Bushfires in 2009. <sup>c</sup> Qld: Accurate identification of incidents attended by QFRS Rural crews is not possible at this stage due to incomplete voluntary reporting procedures. <sup>d</sup> SA: 2006-07 data may be under reported because MFS data entry was not completed by the submission deadline. <sup>e</sup> WA: Dollar losses are based on estimated values provided by firefighters. <sup>f</sup> Tas: data are for *all* fire brigades, both full time and volunteer. Property loss does not include losses as a result of vegetation fires.

Source: State and Territory governments (unpublished); table 9A.8.

The property loss per person (expressed in real terms) has fluctuated over time in all jurisdictions (figure 9.17).

Data for the three year average property loss per person are also available in the attachment tables (table 9A.9).

**Figure 9.17 Property loss from structure fire per person  
(2009-10 dollars)<sup>a, b, c, d, e, f, g, h, i, j</sup>**



<sup>a</sup> Data are adjusted to 2009-10 dollars using the GDP price deflator (2009-10 = 100) (table AA.26). Estimates have not been validated by the insurance industry or adjusted for interstate valuation differences. <sup>b</sup> Historical rates in this figure may differ from those in previous Reports. Population data are revised using Final Rebased ERP data following each Census of Population and Housing (the most recent census was 2006). Financial year population estimates are the midpoint estimate of the relevant financial year (that is, as at 31 December). <sup>c</sup> NSW: Some structure fires resulted in direct dollar loss in excess of \$1 million each. In 2005-06 there were 32 such structure fires with five of these at \$10+ million each and one at \$89 million; 2006-07, 15 at \$1+ million each; 2007-08, 19 at \$1+ million each with four at \$5+ million each and one of \$100 million. <sup>d</sup> Vic: Due to data collection issues, data are incomplete for 2005-06. 2008-09 data do not include loss arising from the Black Saturday Bushfires in 2009. <sup>e</sup> Qld: Accurate identification of incidents attended by QFRS Rural crews is not possible at this stage due to incomplete voluntary reporting procedures. QFRS Urban stations are estimated to serve 87.6 per cent of Queensland's population. In 2007-08 one major incident accounted for \$41 million of the total property loss value. <sup>f</sup> WA: Dollar losses are based on estimated values provided by firefighters. <sup>g</sup> SA: 2006-07 data include a \$15 million fire accounting for 35 per cent of the reported dollar loss that year. Data entry for 2006-07 reported property loss from structure fire was incomplete. <sup>h</sup> Tas: Data are for all fire brigades, both full time and volunteer. For 2007-08, data include two significant fires where the property loss was \$60 million and \$20 million respectively. Property loss does not include losses as a result of vegetation fires. Due to industrial action 90 incident reports are incomplete in 2008-09. <sup>i</sup> Tas, ACT and NT: Due to small population sizes, rates in these jurisdictions may be affected significantly by single large-loss events. <sup>j</sup> Average for Australia excludes rural fire service data for some years as per the jurisdictions' caveats.

Source: State and Territory governments (unpublished); table 9A.9.

## 9.4 Road crash rescue events

A road crash rescue event is an incident involving a motor vehicle and the presumption that assistance is required from ESOs.

A primary aim of governments is to reduce death and injury and the personal suffering and economic costs of road crashes. Achieving this aim is challenging and complex. It requires a range of activities, including design and maintenance of vehicles and roads, driver training, road user education, enforcement of road rules,

emergency response and health care in the event of an incident. The agencies involved in this include emergency services organisations, police services, road and transport authorities, health and community services and others.

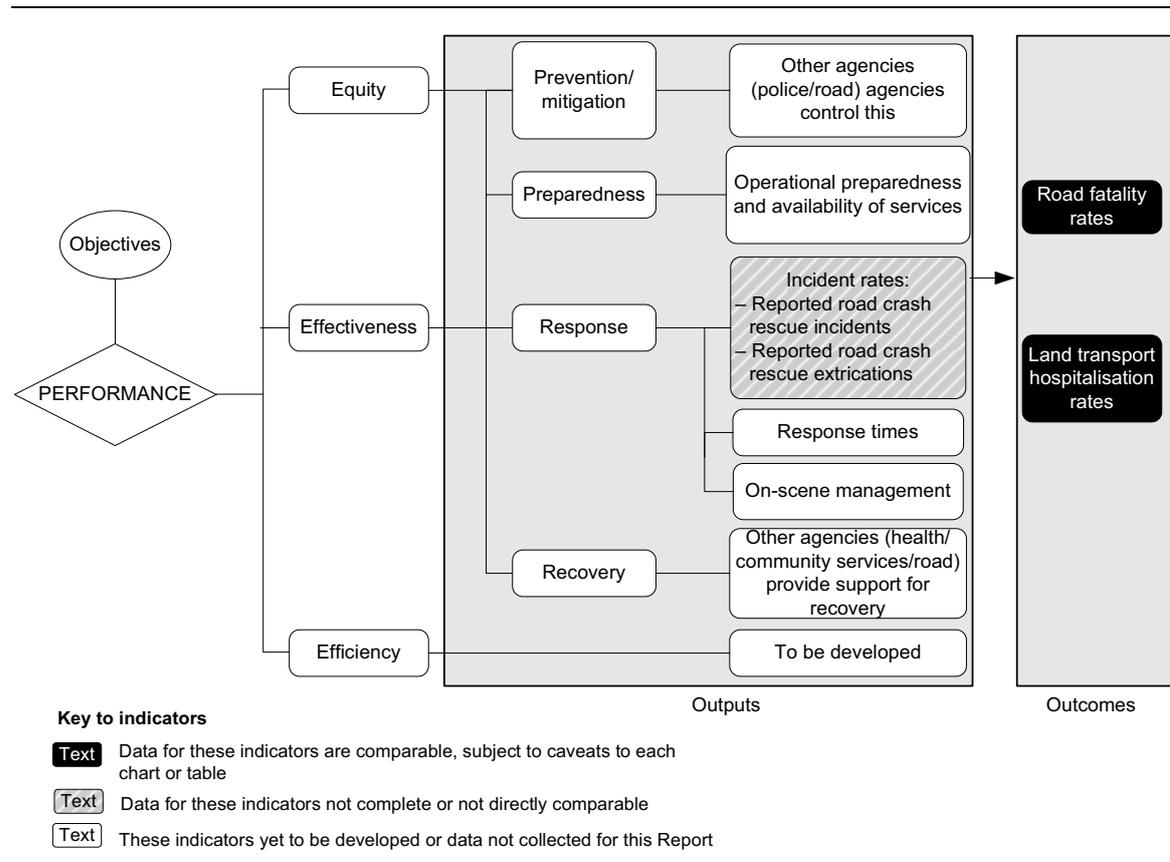
Emergency service organisations provide services that contribute to governments' aims through the provision of effective and efficient medical and rescue services. These rescue services are provided by a diverse range of ESOs; nationally, road crash rescue services are provided by over 20 organisations (table 9A.41).

Some aspects of police activities that are relevant to road crash rescue are addressed in chapter 6, section 6.6.

### Framework of performance indicators

Figure 9.18 presents the performance indicator framework for road crash rescue events.

Figure 9.18 Performance indicators for road crash rescue events



The framework represents the key elements of a road crash rescue reporting framework. A number of complex issues require further work to develop indicator

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definitions and identify key measures and data sources. This work will be undertaken progressively for future editions of the Report.

The focus of reporting in this section of the Report is on the preparedness, response and efficiency indicators for road crash rescue events. Related road safety reporting is included in the Police services chapter under road safety (chapter 6, section 6.6). Data relating to patient transportation are incorporated into ambulance events reporting later in this chapter (section 9.5).

#### *Equity and effectiveness — prevention/mitigation*

The prevention/mitigation and recovery elements of the performance framework for road crash rescue are largely controlled by agencies other than the ESOs covered by this chapter; for example, prevention of road crashes through community safety campaigns, regulation and law enforcement is predominately a police activity. Agencies involved in recovery range from traffic authorities reopening roadways, to the health and community sectors for rehabilitation of patients.

The National Road Safety Strategy (NRSS), and related Action Plan (ATC 2000 and 2009) provide the framework and priority areas for coordinating the road safety initiatives of Australian, State, Territory and local governments, as well as other major organisations with road safety responsibilities.

#### *Equity and effectiveness — preparedness*

‘Operational preparedness and availability of services’ indicators are linked to the NRSS and aim to improve trauma, medical and retrieval services. Indicators will focus on the number and availability of appropriately trained and authorised personnel (staff and volunteers), and location of facilities. Definitions and data are yet to be developed for reporting on a nationally comparable basis (box 9.16).

#### **Box 9.16 Operational preparedness and availability of services**

Specific measures of operational preparedness and availability of services are yet to be defined.

This indicator and associated measures are currently under development.

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### *Equity and Effectiveness — response*

The effectiveness dimension of response indicators relates to emergency service organisations' ability to respond to road crash rescue events.

#### *Reported road crash rescue incidents and extrications*

'Reported road crash rescue incidents and extrications' is an indicator of governments' objective to reduce the adverse effects of road incidents on the community through appropriate response activities (box 9.17).

#### **Box 9.17 Reported road crash rescue incidents and extrications**

'Reported road crash rescue incidents' is defined as the number of reported incidents involving a motor vehicle and the presumption that assistance is required from emergency services organisations. It is measured by the rate of reported road crash rescue incidents per 100 000 people.

'Reported road crash rescue extrications' is defined as an assisted release and removal of trapped people (usually casualties) from motor vehicles by specially equipped and trained emergency service crews, arising from incidents reported. It is measured by the rate of reported extrications per 100 000 people; per 100 000 registered vehicles; and per million vehicle kilometres travelled.

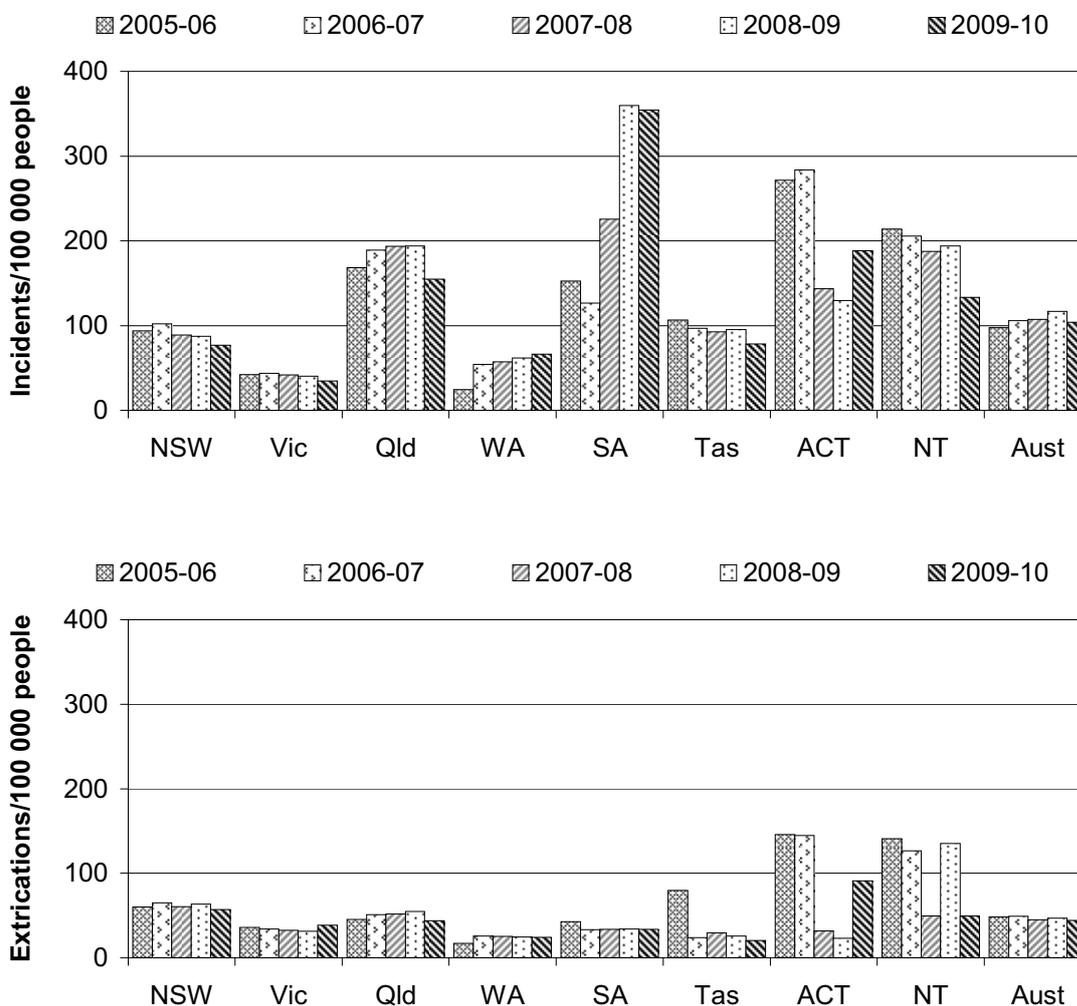
A lower or decreasing number of reported road crash rescue incidents and extrications, adjusted for population, indicates a better community outcome. Higher or increasing proportions of reported road crash rescue incidents and extrications indicate higher emergency response workloads.

Data for this indicator are not directly comparable.

Nationally, there were 23 012 road crash rescue incidents in 2009-10, or 103.9 incidents per 100 000 people (table 9A.19), and 9 824 (or 42.7 per cent) of reported incidents required an extrication response (table 9A.20).

Data for road crash rescue incidents and extrications per 100 000 people display some marked variations across jurisdictions — this may reflect different collection methods and the lack of comparability between jurisdictions. Although a five year time series is presented in figure 9.19, collection methods are improving over time, making trend analysis difficult.

**Figure 9.19 Reported road crash rescue incidents and extrications<sup>a, b, c, d, e, f</sup>**



<sup>a</sup> Vic: Due to data collection issues, data are incomplete for 2005-06. A higher number of extractions has been observed for 2009-10 due to incidents involving a greater number of vehicles. <sup>b</sup> Qld: QFRS Rural Incident Database does not currently record the necessary information to calculate this measure. The decrease in QFRS attendance at traffic incidents in 2009-10 can be attributed to the revised road crash rescue protocols implemented in September 2009 to reduce unnecessary attendance by the QFRS at mobile property crashes. <sup>c</sup> WA: Data include road crash rescue incidents attended by fire services and SES; Extractions data include those performed by career and volunteer fire services and SES volunteers. <sup>d</sup> Tas: Data include responses by fire services, ambulance services and SES. <sup>e</sup> ACT: Data were refined in 2007-08 to provide a more accurate reflection of road crash rescue incidents and extrications. <sup>f</sup> Historical rates in this figure may differ from those in previous Reports. Population data are revised using Final Rebased Estimated ERP data following each Census of Population and Housing (the most recent census was 2006). Financial year population estimates are the midpoint estimate of the relevant financial year (that is, as at 31 December).

Source: State and Territory governments (unpublished); tables 9A.19-20.

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### *Response times*

Response times are an important element of a comprehensive road crash rescue framework. Timely, reliable, effective and safe emergency response services reduce the negative impacts of road crash events. Definitions and data are yet to be developed for reporting on a nationally comparable basis (box 9.18).

#### **Box 9.18 Response times**

Specific response times indicators and associated measures for road crash rescue are currently under development.

### *On-scene management*

On-scene management (involving coordination of emergency response personnel, traffic control and securing the scene to prevent new crashes, clean up of hazardous materials, coordination of public cooperation, etc.) is an important factor in achieving the NRSS outcomes of improved trauma, medical and retrieval services (box 9.19).

#### **Box 9.19 On-scene management**

On-scene management indicators and associated measures are currently under development.

### *Equity and effectiveness — recovery*

The recovery element of the performance framework for road crash rescue is largely controlled by agencies other than the ESOs reporting in this chapter.

Complex interface and cross-cutting issues are associated with recovery indicators. For example the level of recovery from injury after major road emergency incidents may be influenced by a number of services including: ambulance, hospital, community and primary health care and disability services.

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## Efficiency

The Steering Committee has identified efficiency indicators as an important element of the performance indicator framework (chapter 1, section 1.5) (box 9.20).

### Box 9.20 Efficiency

Appropriate efficiency indicators, and associated data sources, for road crash rescue events are yet to be developed.

Identifying the cost of road crashes supports policy development and cost-benefit analysis for road safety programs and infrastructure projects, and is consistent with the overall objectives of emergency management. Road crash costs in Australia have recently been analysed by the Bureau of Infrastructure, Transport and Regional Economics (BITRE) (box 9.21).

### Box 9.21 The cost of road crashes in Australia

In February 2010, the Bureau of Infrastructure, Transport and Regional Economics (BITRE) released an evaluation report updating previous research and cost estimates for road crashes in Australia.

The social cost of road crashes in 2006 was an estimated \$17.85 billion (1.7 per cent of GDP). This was a real decrease of 7.5 per cent compared to 1996 (2006 dollars). Estimated human losses were approximately \$2.4 million per fatality, losses for a hospitalised injury were approximately \$214 000 per injury (including disability-related costs), and losses for non-hospitalised injury were approximately \$2200 per injury.

The research found that the estimated real cost of road crashes has declined in the ten years from 1996 to 2006. Road crash fatalities peaked in 1970 and many factors have contributed to reductions in the number of fatalities since then. These include investments in road infrastructure and road safety programs, regulated changes in vehicle safety standards (for example, mandatory seat belts), and better vehicle design and safety equipment such as airbags.

Further information can be sourced through the BITRE website: [www.bitre.gov.au](http://www.bitre.gov.au).

*Source: BITRE (2009) Road Crash Costs in Australia 2006*

## Outcomes

Outcomes are the impact of services on the status of an individual or group (while outputs are the services delivered) (see chapter 1, section 1.5).

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### *Road fatality rates and land transport hospitalisation rates*

Road fatality rates and land transport hospitalisation rates are indicators of governments' objective to reduce death and injury from road crash incidents. Many agencies and factors affect these outcomes. Relevant data for road deaths and land transport hospitalisations are reported in chapter 6 (section 6.6). Nationally, road transport incidents accounted for 1426 deaths in 2009-10, (table 6A.38) and 39 166 hospitalisations in 2008-09 (table 6A.39).

## **9.5 Ambulance events**

This section provides information on the performance of ESOs in providing services for ambulance events and in preparing the community to respond to emergencies. Ambulance events are incidents that result in demand for ambulance services to respond, including: emergency and non-emergency pre-hospital and out-of-hospital patient care; transport; inter-hospital patient transport; specialised rescue services; ambulance services to multi-casualty events; and capacity building for emergencies.

### **Emergency management services for ambulance events**

Ambulance service organisations are the primary agencies involved in providing services for ambulance events. In a limited number of cases, other organisations provide services such as medical transport for emergencies (table 9A.41). The descriptive information provided below on funding, incidents and human resources are for ambulance service organisations only. Ambulance assets are reported in table 9A.26.

#### *Revenue*

Total revenue of ambulance service organisations covered in this Report was approximately \$2.1 billion in 2009-10. Nationally, revenue (expressed in real terms) increased each year from 2005-06 to 2009-10, with an average annual growth rate of 6.1 per cent (table 9.4).

**Table 9.4 Revenue of ambulance service organisations (2009-10 dollars) (\$ million)<sup>a, b</sup>**

	<i>NSW</i>	<i>Vic</i>	<i>Qld</i>	<i>WA</i>	<i>SA</i>	<i>Tas</i>	<i>ACT</i>	<i>NT</i>	<i>Aust<sup>b</sup></i>
2005-06	496.0	485.8	382.4	115.0	130.2	31.3	22.8	18.5	1 682.1
2006-07	517.2	474.6	410.0	119.1	132.9	33.5	20.9	19.6	1 727.8
2007-08	577.4	497.4	435.5	126.3	146.4	35.3	22.7	21.0	1 862.2
2008-09	624.8	517.8	466.8	122.3	180.5	43.9	23.4	22.3	2 001.8
2009-10	652.7	541.0	491.1	135.6	180.3	50.9	23.2	18.8	2 093.8

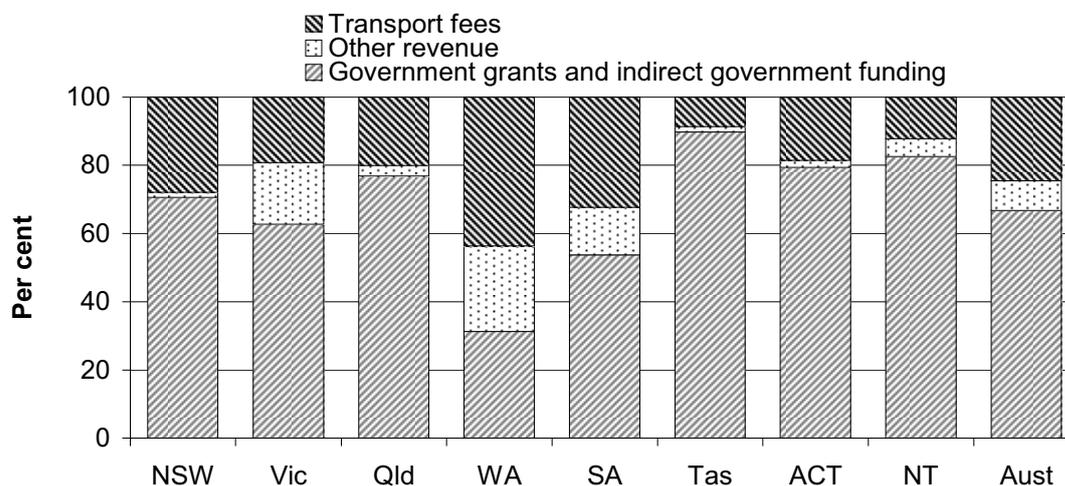
<sup>a</sup> Data are adjusted to 2009-10 dollars using the GDP price deflator (2009-10 = 100) (table AA.26). Due to differences in definitions and counting rules, data reported may differ from data in agency annual reports and other sources. <sup>b</sup> Totals may not sum due to rounding.

Source: State and Territory governments (unpublished); table 9A.22.

Ambulance service organisations are funded by a variety of sources, with non-government sources making a significant contribution.

The primary sources of revenue across all jurisdictions in 2009-10 were grants from State and Territory governments, transport fees (from government hospitals, private citizens and insurance) and other revenue (subscriptions, donations and miscellaneous revenue) (figure 9.20).

**Figure 9.20 Major sources of ambulance service organisation revenue, 2009-10<sup>a</sup>**



<sup>a</sup> Other revenue is equal to the sum of subscriptions, donations and miscellaneous revenue.

Source: State and Territory governments (unpublished); table 9A.22.

Nationally, 66.7 per cent of funding for ambulance service organisations in 2009-10 was provided as direct government revenue and indirect government revenue, with the remainder sourced from transport fees and other revenue (table 9A.22).

## Incidents

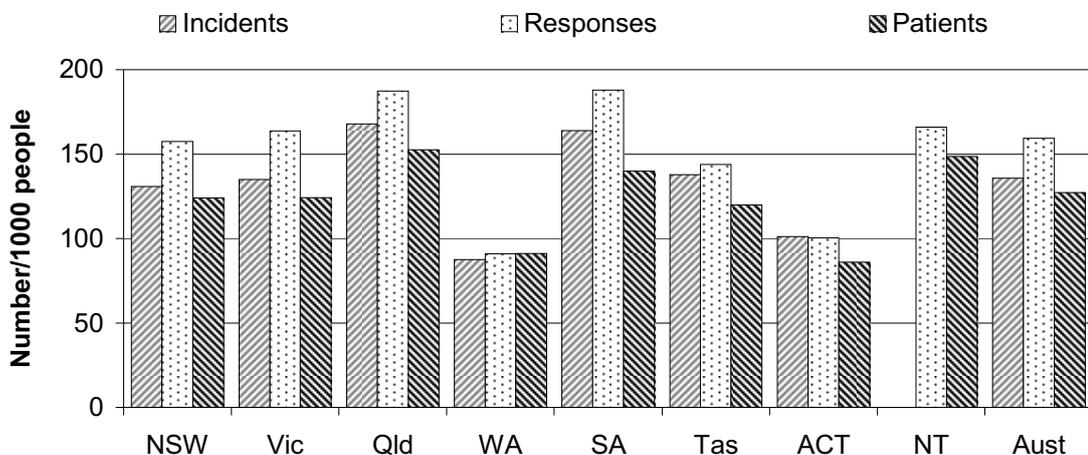
Ambulance service organisations attended 3.01 million incidents nationally in 2009-10 (excluding the NT) (table 9A.23). Most of these were emergency incidents (40.9 per cent), followed by non-emergency incidents (34.0 per cent) and urgent incidents (24.8 per cent).

### *Ambulance incidents, responses and patients per 1000 people*

The numbers of incidents, responses and patients are interrelated. Multiple responses/vehicles may be sent to a single incident, and there may be more than one patient per incident. There may also be responses to incidents that do not have people requiring treatment and/or transport.

Nationally, there were approximately 159 responses per 1000 people, and 127 patients per 1000 people, in 2009-10 (figure 9.21).

**Figure 9.21 Reported ambulance incidents, responses and patients, 2009-10<sup>a, b, c, d, e</sup>**



<sup>a</sup> An incident is an event that results in a demand for ambulance resources to respond. An ambulance response is a vehicle or vehicles sent to an incident. There may be multiple responses/vehicles sent to a single incident. A patient is someone assessed, treated or transported by the ambulance service. <sup>b</sup> Vic: Incidents and responses are for road ambulances only. <sup>c</sup> WA: Does not have a policy of automatically dispatching more than one unit to an incident unless advised of more than one patient. Separate statistics are not kept for incidents and responses. Numbers shown under incidents are cases. <sup>d</sup> NT: A response is counted as an incident. Data for incidents are not available and are not included in the rate for Australia. <sup>e</sup> Historical rates in this figure may differ from those in previous Reports. Population data are revised using Final Rebased ERP data following each Census of Population and Housing (the most recent census was 2006). Financial year population estimates are the midpoint estimate of the relevant financial year (that is, as at 31 December).

Source: State and Territory governments (unpublished); table 9A.23.

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### *Emergency department triage category by ambulance transport rate*

Emergency department presentation rates and demand for ambulance services are closely linked. The majority of people who are acutely ill or injured and need to attend a hospital emergency department will call the ambulance service to provide immediate pre-hospital care and then take them to hospital.

The Emergency Department National Triage Scale category allocated to a patient on arrival at the emergency department is a nationally comparable measure of how acutely ill the patient is on arrival at the hospital, ranging from triage category 1 (for a patient in immediate need of attention) to triage category 5 (for patients who have a presenting condition that indicates they can safely wait for 2 hours to see a doctor) (chapter 10, box 10.4).

Nationally, in 2008-09 (later data are not available), 84.3 per cent of emergency department patients in triage category 1 arrived by ambulance, air ambulance or helicopter rescue services, and 48.0 per cent of patients in triage category 2. For all triage categories, 23.3 per cent of patients arrived by ambulance, air ambulance or helicopter rescue services (table 9.5).

**Table 9.5 Emergency department patients who arrived by ambulance, air ambulance or helicopter rescue services, by triage category 2008-09 (per cent)<sup>a</sup>**

<i>Triage category</i>	<i>NSW</i>	<i>Vic</i>	<i>Qld</i>	<i>WA</i>	<i>SA</i>	<i>Tas</i>	<i>ACT</i>	<i>NT</i>	<i>Aust</i>
1 — Resuscitation	82.8	82.9	87.1	85.8	85.6	90.1	84.4	72.9	84.3
2 — Emergency	48.2	46.7	53.5	40.3	50.2	55.0	39.3	41.3	48.0
3 — Urgent	34.3	33.9	36.9	25.8	36.6	36.7	29.8	25.1	34.0
4 — Semi-urgent	19.4	14.2	16.1	9.8	14.4	14.1	12.5	10.7	15.7
5 — Non-urgent	5.8	2.5	3.9	2.5	4.7	2.8	2.7	3.8	4.3
<b>Total</b>	<b>24.2</b>	<b>21.4</b>	<b>26.9</b>	<b>17.8</b>	<b>26.4</b>	<b>23.6</b>	<b>19.1</b>	<b>16.3</b>	<b>23.3</b>

<sup>a</sup> Data represent the 78 per cent of emergency department presentations for which patient-level data were available. Data include all presentations.

Source: AIHW (2010) *Australian Hospital Statistics*, National Non-admitted Patient Emergency Department Care Database.

### *Aero-medical arrangements in Australia*

Arrangements for air ambulance or aero-medical services vary throughout Australia. Some of these arrangements involve services provided entirely by State and Territory ambulance services or by sub-contractors to these services, while others are provided completely externally to the State ambulance services. Some arrangements involve a mix of the two, where external organisations provide aircraft and/or air crew while ambulance service organisations provide paramedics

to staff the air ambulances. The result is that the revenue (funding) and expenditure for air ambulance services are included in ambulance reports from some jurisdictions while in other jurisdictions none of these costs are included.

The Australian Government also provides some capital and recurrent funding for aero-medical service provision through the Royal Flying Doctor Service, mainly for primary health services to rural and remote communities. In some jurisdictions, these same aircraft are used to transfer patients requiring higher level care.

It is not possible for ambulance service organisations to provide full activity and financial data for air ambulance services in Australia. The Council of Ambulance Authorities (CAA) has tried to identify, as comprehensively as possible, air ambulance services provided by ambulance service organisations directly, or by other service providers such as the Royal Flying Doctor Service. In doing so, the CAA has counted the total number of aircraft available in each jurisdiction during 2009-10, and the component of expenditure that is funded through ambulance service expenditure (that is, the expenditure figures do not represent total expenditure, only that component funded through ambulance services) (table 9.6).

**Table 9.6 Aero medical resources and expenditure, 2009-10<sup>a, b, c, d</sup>**

	<i>NSW</i>	<i>Vic</i>	<i>Qld</i>	<i>WA</i>	<i>SA</i>	<i>Tas</i>	<i>ACT</i>	<i>NT</i>	<i>Aust</i>
Operated by State Ambulance Service									
Fixed wing	4	4	–	–	–	1	–	–	9
Helicopter	5	5	–	1	–	–	–	–	11
Operated by other service providers									
Fixed wing	1	–	13	13	7	–	–	–	34
Helicopter	5	–	15	2	3	1	1	–	27
<b>Total aircraft</b>	15	9	28	16	10	2	1	–	81
<b>Expenditure (\$'000)</b>	80 361	36 444	–	1 322	na	3 570	569	–	122 266

<sup>a</sup> These figures do not represent the total air ambulance medical expenditure for jurisdictions, but only that funded through ambulance services and reported as part of the total ambulance service expenditure. <sup>b</sup> WA, SA and NT: Fixed wing services are provided by the Royal Flying Doctor Service (RFDS). In addition, AMS, a NT Government operated aero-medical service, operates in the 'top end' of the NT. <sup>c</sup> Tas: Aircraft and pilot are provided by the RFDS under contract, aero medical crew are provided by the State. – Nil or rounded to zero. <sup>d</sup> Not available. <sup>d</sup> Change in aircraft and helicopter numbers compared with the previous year, are largely due to changes in the data dictionary.

Source: Council of Ambulance Authorities (CAA) (unpublished).

### *Human resources*

Data on human resources are reported by operational status on a full time equivalent (FTE) basis. Human resources include any person involved in delivering and/or managing the delivery of ambulance services, including:

- 
- ambulance operatives (including patient transport officers, students and base level ambulance officers, qualified ambulance officers, other clinical personnel and communications operatives)
  - operational and corporate support personnel (including management, operational planners and coordinators, education and training personnel, corporate support personnel, non-operative communications and technical personnel)
  - remunerated and non-remunerated volunteers and ambulance community first responders. Ambulance community first responders are a type of volunteer that provide an emergency response (with no transport capacity) and first aid care before ambulance arrival.

Nationally, 13 732 FTE salaried personnel were involved in the delivery of ambulance services in 2009-10. The majority of salaried ambulance personnel in 2009-10 were ambulance operatives (82.2 per cent) (table 9A.24).

Nationally, 5588 volunteer personnel (comprising 5175 operatives and 413 support personnel) participated in the delivery of ambulance services in 2009-10. The proportion of volunteer personnel and the nature of their role varied across jurisdictions. Given the decentralised structure of its ambulance service operations, WA has a relatively higher number of volunteer operational and corporate support personnel (table 9A.24).

Nationally there were 1465 ambulance community first responders in 2009-10 (table 9A.24). In some locations the first responder service is provided by another emergency service agency, for example, a fire service.

## **Framework of performance indicators**

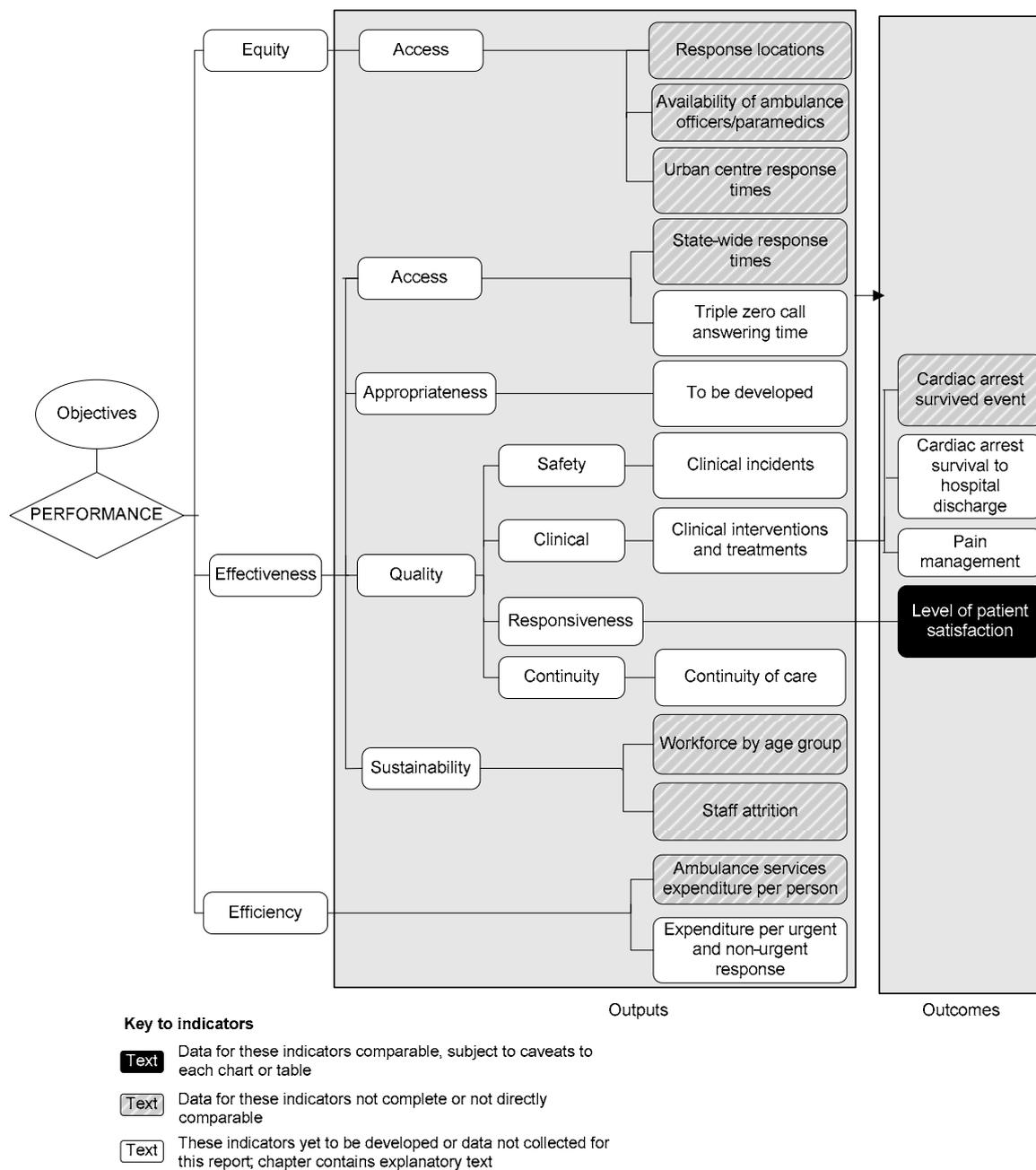
Figure 9.22 presents the performance indicator framework for ambulance events. This framework is based on the general framework for the health section of the Report. It was introduced in the 2009 Report to replace the framework presented in previous reports — which was based on the general framework for all emergency events.

The performance indicator framework for ambulance events shows which data are comparable in the 2011 Report. For all data, supporting text and footnotes include caveats relevant to interpretation. Indicators that are considered comparable are only comparable subject to accompanying caveats. Chapter 1 discusses data comparability from a Report wide perspective (see section 1.6). Definitions of all indicators are provided in section 9.8.

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Caution should be exercised in making comparisons between the ambulance service organisations because of differences in geography, population dispersal and service delivery models. The Report's Statistical Appendix contains demographic and socioeconomic data that may assist in interpreting the performance indicators presented in this section.

**Figure 9.22 Performance indicators for ambulance events**



## Key performance indicator results

### Outputs

Outputs are the services delivered (while outcomes are the impact of these services on the status of an individual or group) (see chapter 1, section 1.5). Output indicators for ambulance services are: ‘response locations’; ‘availability of

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ambulance officers/paramedics'; 'urban centre response times'; 'state-wide response times'; 'triple zero call answering time'; 'clinical incidents'; 'clinical interventions and treatments'; 'continuity of care'; 'workforce by age group'; 'staff attrition'; 'ambulance service organisations expenditure per person'; and 'expenditure per urgent and non-urgent response'.

### *Equity — access*

Equity of access indicators measure access to services by groups in the community who may have special needs.

### *Response locations*

'Response locations' is an indicator of governments' objective of providing accessible emergency ambulance services to communities (box 9.22).

#### **Box 9.22 Response locations**

'Response locations' is defined as the number of paid (or salaried), mixed and volunteer response locations per 100 000 people. Locations are primary ambulance response locations where paid, volunteer or a mix of paid and volunteer ambulance operatives are responding in an ambulance vehicle and providing pre-hospital care.

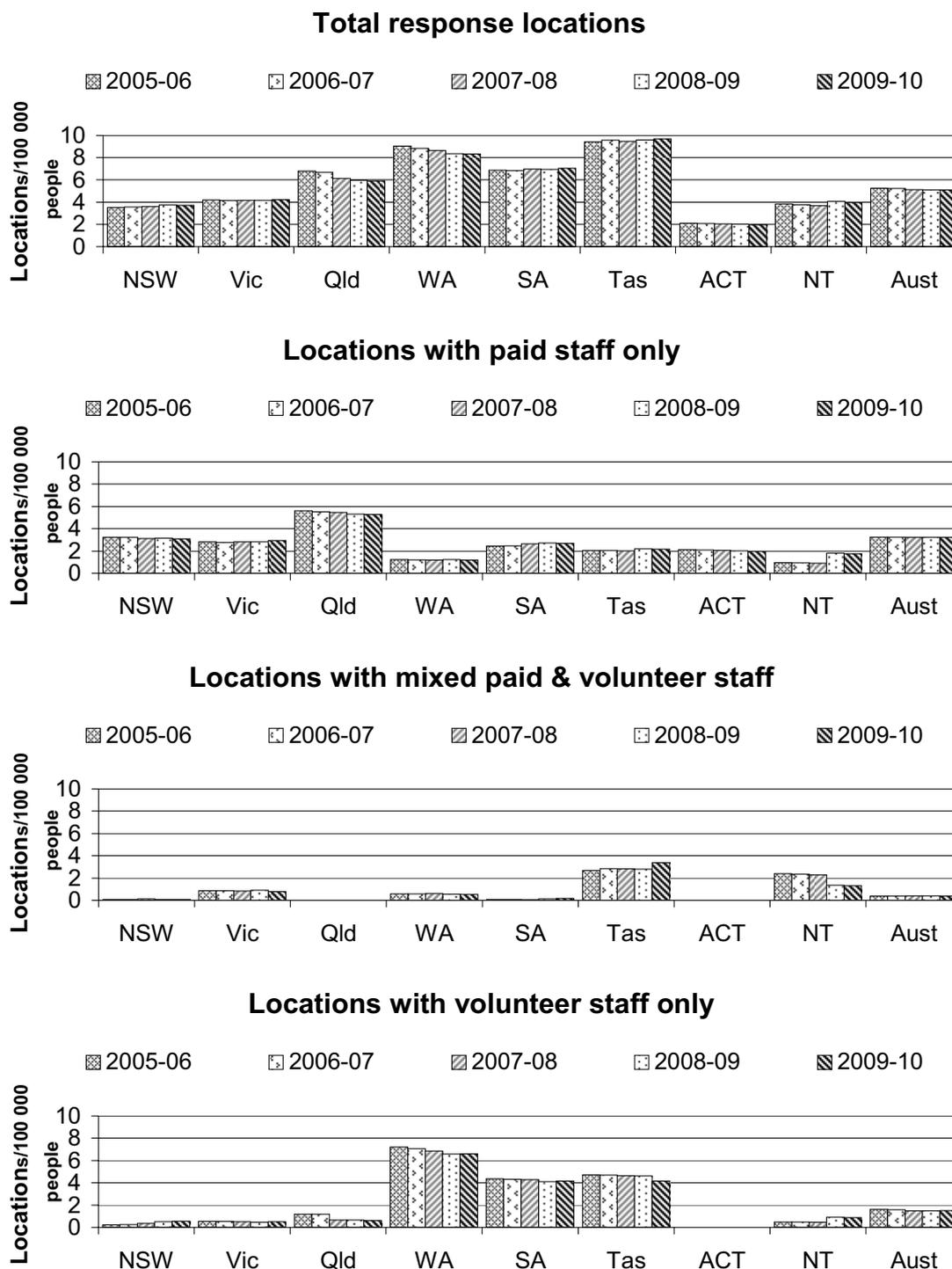
Higher or increasing numbers of paid, mixed and/or volunteer response locations, after adjusting for population, suggests better ambulance service response capacity.

This indicator complements the 'availability of paramedics' indicator, as some jurisdictions' ambulance workforce comprises a large proportion of volunteers, particularly in rural and remote locations. This indicator also helps explain variation in expenditure for ambulance services across jurisdictions. For example, in some jurisdictions, smaller rural areas are serviced by paid ambulance personnel whereas in others, there may be a mix of paid and volunteer personnel or wholly volunteer personnel. Service delivery strategies have a significant impact on cost and help explain differentials in expenditure per person between jurisdictions. For example figure 9.23 shows that WA and Tasmania have the highest numbers of response locations per person yet they both have lower than average expenditure per person (figure 9.29) which is in part explained by their relatively higher reliance on volunteers for rural service delivery.

Data for this indicator are not directly comparable.

Nationally, there were 5.1 paid, mixed and volunteer response locations per 100 000 people in 2009-10 (table 9A.27). The number of salaried, mixed and volunteer response locations per 100 000 people varied across jurisdictions (figure 9.23).

Figure 9.23 Number of paid, mixed and volunteer response locations<sup>a, b, c</sup>



<sup>a</sup> Historical rates in this figure may differ from those in previous Reports. Population data are revised using Final Rebased ERP data following each Census of Population and Housing (the most recent census was 2006). Financial year population estimates are the midpoint estimate of the relevant financial year (that is, as at 31 December). Some jurisdictions do not satisfy the criteria for all the staffing categories. <sup>b</sup> Response locations data for 2007-08 and subsequent years reflect changes in the new data definition, which does not include first responder locations. <sup>c</sup> ACT: There are no mixed or volunteer only response locations in the ACT.

Source: State and Territory governments (unpublished); table 9A.27.

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### *Availability of ambulance officers/paramedics*

‘Availability of ambulance officers/paramedics’ is another indicator of governments’ objective of providing equitable and accessible ambulance services to communities (box 9.23).

#### **Box 9.23 Availability of ambulance officers/paramedics**

‘Availability of ambulance officers/paramedics’ is defined as the number of full time equivalent ambulance officers/paramedics per 100 000 people. Ambulance officers/paramedics includes student and base level ambulance officers and qualified ambulance officers but excludes patient transport officers.

Higher or increasing availability of ambulance officers/paramedics, after adjusting for population, suggests better ambulance service response capacity.

The role of paramedics is expanding to provide primary health care, improve emergency response capabilities and strengthen community healthcare collaborations in rural and remote communities (Stirling et al 2007). Many rural and remote communities do not have access to adequate health care due, in part, to the difficulty in recruiting and retaining health professionals to these areas. Paramedics provide some of these communities with extended access to health service delivery. Expanding roles are also developing in metropolitan areas as a response to overstretched emergency departments where paramedics often continue caring for the patient on arrival at hospital.

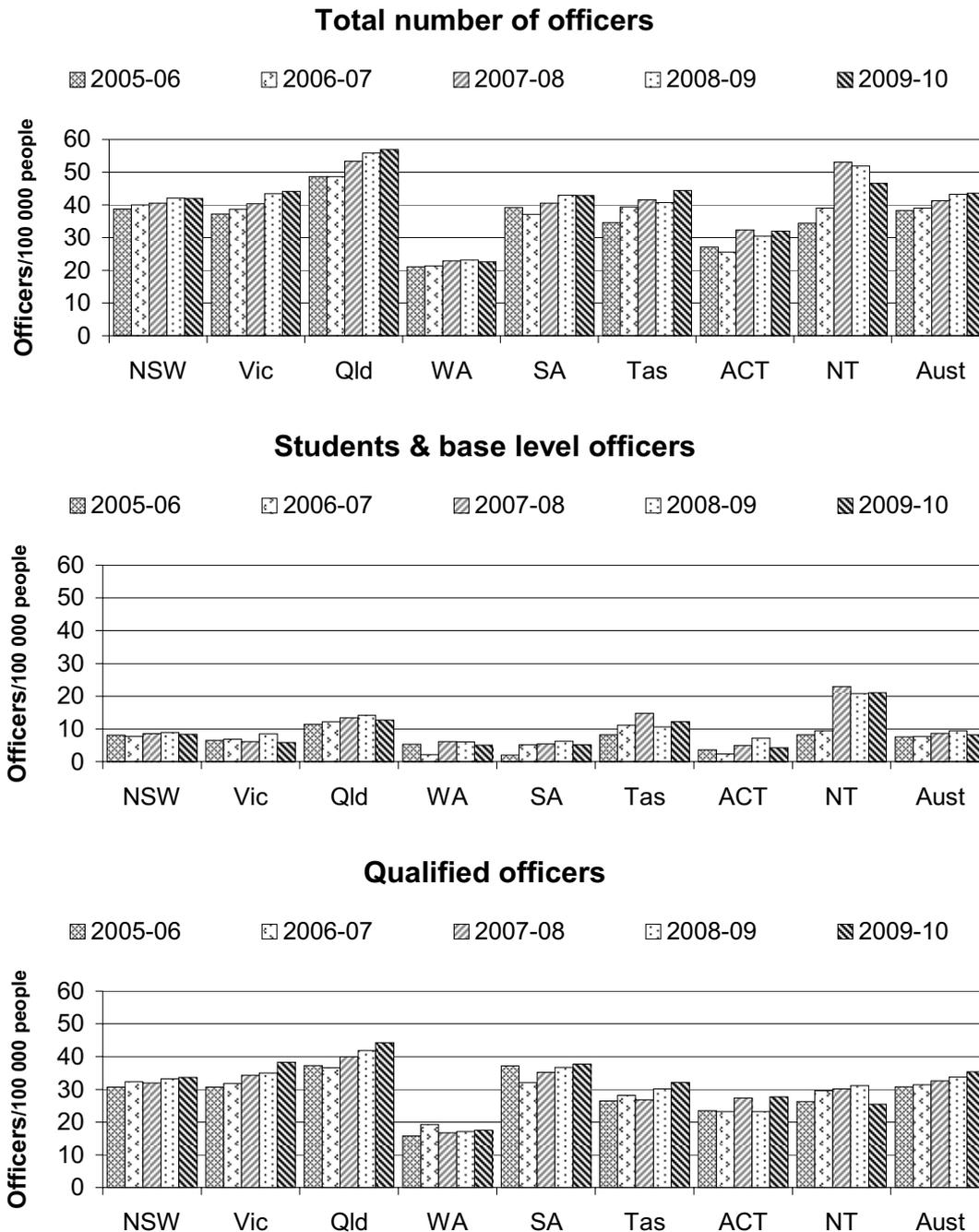
This indicator needs to be interpreted with care because ambulance responses in some jurisdictions, particularly in rural and remote locations, are predominantly provided by volunteers. Therefore the results reported may indicate a lower level of access for these jurisdictions. However, this indicator is complemented by the response locations indicator, which identifies jurisdictions that provide an ambulance response utilising volunteers. The higher the proportion of paramedics in a jurisdiction the higher the cost of service provision. In small rural areas which have low frequency of medical emergencies it is very costly to provide paramedic personnel and it also raises issues with skills maintenance for paramedics when the caseload they are exposed to is low.

Data for this indicator are not directly comparable.

Nationally, there were 43.6 FTE ambulance officers/paramedics per 100 000 people in 2009-10 (table 9A.24).

The number of FTE ambulance officers/paramedics per 100 000 people varied across jurisdictions (figure 9.24).

**Figure 9.24 Number of full time equivalent ambulance officers/paramedics<sup>a, b</sup>**



<sup>a</sup> Data relate to paid staff only. <sup>b</sup> Historical rates in this figure may differ from those in previous Reports. Population data are revised using Final Rebased ERP data following each Census of Population and Housing (the most recent census was 2006). Financial year population estimates are the midpoint estimate of the relevant financial year (that is, as at 31 December).

Source: State and Territory governments (unpublished); table 9A.24.

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## *Response times*

‘Response times’ are indicators of governments’ objective of providing equitable, accessible and effective ambulance services to communities (box 9.24).

### **Box 9.24 Response times**

‘Response times’ is defined by two measures:

- the time within which 50 per cent of the first responding ambulance resources arrive at the scene of an emergency in code 1 situations
- the time within which 90 per cent of the first responding ambulance resources arrive at the scene of an emergency in code 1 situations.

The response time is defined as the time taken between the initial receipt of the call for an emergency ambulance and the ambulance’s arrival at the scene of the emergency (figure 9.24). Emergency responses are categorised by an assessment of the severity of the medical problem:

- code 1 — responses to potentially life threatening situations using warning devices
- code 2 — responses to acutely ill patients (not in life threatening situations) where attendance is necessary but no warning devices are used.

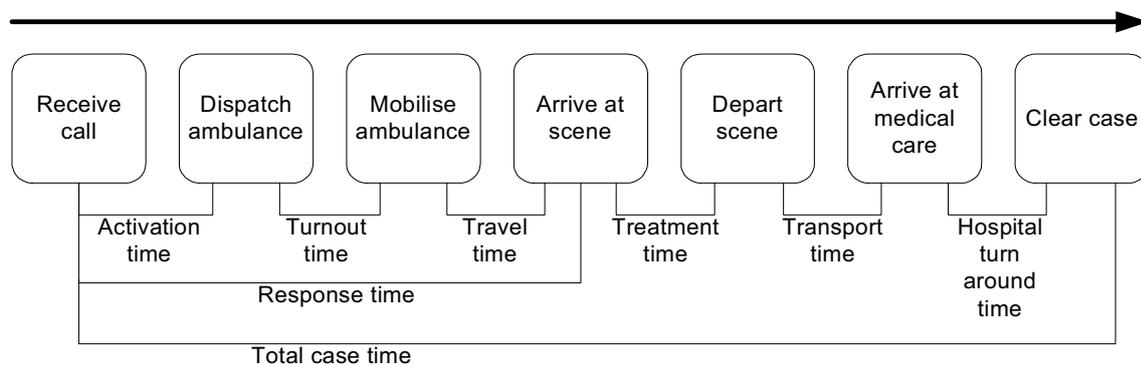
Shorter response times suggest the adverse effects on the community of emergencies requiring ambulance services are reduced.

Response time data need to be interpreted with care, because performance is not strictly comparable across jurisdictions.

- Response time data for some jurisdictions (when calculated on a State-wide basis) represent responses to urban, rural and remote areas, while others include urban areas only.
- Response time data in some jurisdictions include responses from volunteer stations where turnout times are generally longer because volunteers are on call rather than on duty.
- Response times can be affected by the dispersion of the population (particularly rural/urban population proportions), topography, road/transport infrastructure and traffic densities.

Although definitions of response times are consistent, not all jurisdictions have systems in place to capture all components of response time for all cases, from the time of the call to arrival at the scene. Differences across jurisdictions in definitions of geography, personnel mix, and system type for capturing data, affect the comparability of response times data. The commencement of recording ambulance service response times varies as per the jurisdictions’ caveats.

**Figure 9.25 Response time points and indicators for ambulance events**



### *Urban centre response times*

‘Urban centre response times’ is an indicator of governments’ objective of providing equitable and accessible ambulance services to communities (box 9.25).

#### **Box 9.25 Urban centre response times**

‘Urban centre response times’ is the response time, as defined in box 9.24, for urban centre responses.

Shorter, or reducing, response times suggest the adverse effects on the community of emergencies requiring ambulance services are reduced.

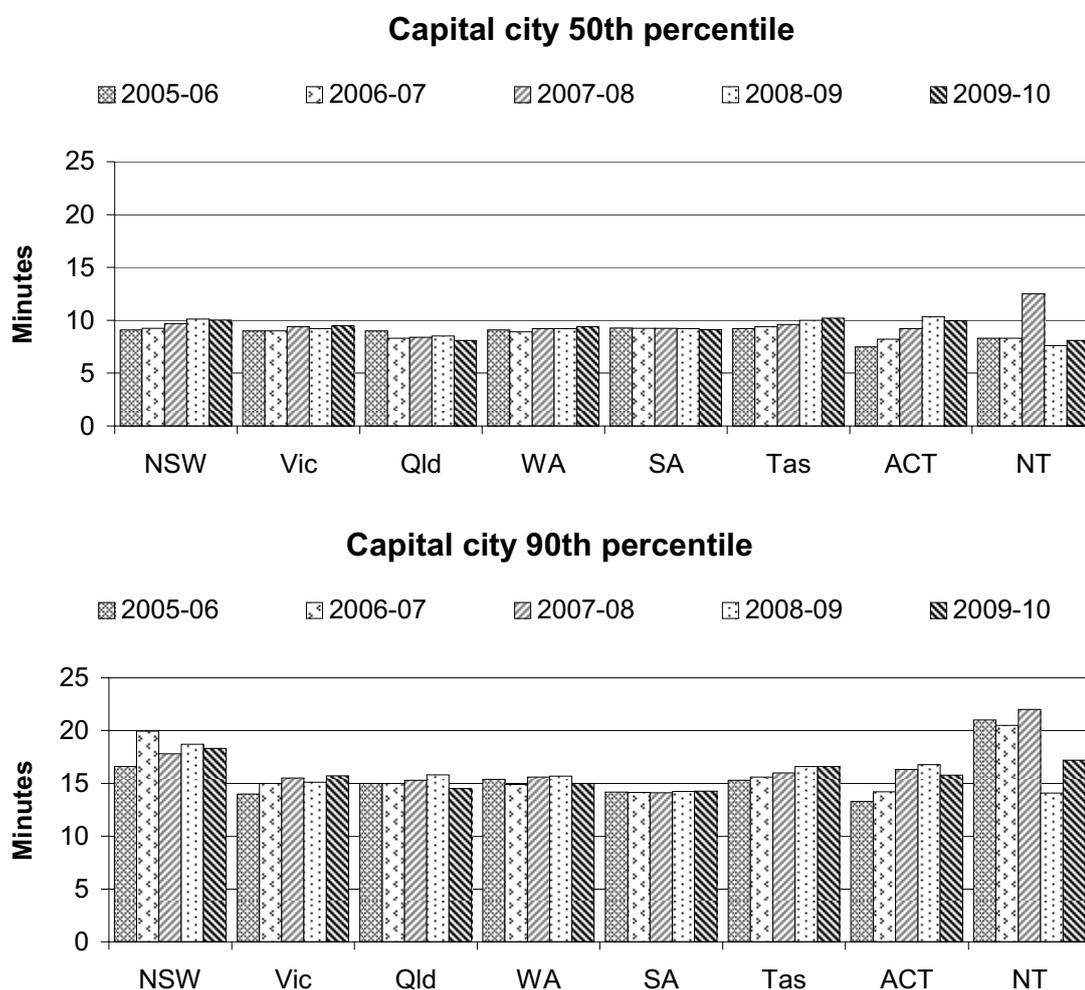
Population densities across Australian capital cities varies considerably and this can impact on response time performance. This indicator might be further developed to report data for urban centres with populations of 50 000 and above in future Reports.

Data for this indicator are not directly comparable.

Nationally in 2009-10, the time within which 50 per cent of the urban centre first responding ambulance resources arrived at the scene of an emergency in code 1 situations ranged from 8.1 to 10.2 minutes, and the time within which 90 per cent of the urban centre first responding ambulance resources arrived at the scene of an emergency in code 1 situations ranged from 14.3 to 18.3 minutes across jurisdictions (figure 9.26).

Urban centre response times within most jurisdictions remained steady between 2005-06 and 2009-10 (table 9A.29).

Figure 9.26 Ambulance response times (urban centre)<sup>a, b, c, d, e</sup>



<sup>a</sup> Response times commence from the following time points: Vic, SA and Tas first key stroke; NSW, Qld and WA transfer to dispatch; and the NT crew dispatched. In 2007-08 the ACT response times commence from the first key stroke, whereas, in 2005-06 to 2006-07 response times commenced from incident creation. Therefore, ACT data across years are not directly comparable. Capital city response times are calculated using urban centre boundaries based on the ABS Urban Centres Localities structure. Response times for NSW and SA do not strictly adhere to the urban centre boundaries. <sup>b</sup> NSW: Did not triage emergency calls prior to 2005-06. Results for code 1 cases represent '000' and urgent medical incidents. <sup>c</sup> Vic: Prior to 2007-08, data sourced from Patient Care Records completed by paramedics; from 2007-08 metropolitan data sourced from CAD system and not directly comparable with previous years. <sup>d</sup> Qld: Casualty room attendances are not included in response count and, therefore, are not reflected in response times data. Response time calculations for percentages and percentiles for both Capital City and State sourced from Computer Aided Dispatch (CAD) system. <sup>e</sup> SA: Prior to 2006-07 code 1 response times were calculated on all responses to category 1 and 2 cases and based on patient case cards. Code 1 response times for 2006-07 are now calculated from SA Ambulance CAD data and are more aligned to the definitions provided by the CAA. Code 1 response times for 2006-07 exclude second and subsequent vehicles arriving at an incident and exclude incidents where the category of dispatch was upgraded. As a result, the data are not directly comparable with prior years.

Source: ABS (2008 and unpublished) *Statistical Geography: Volume 3 — Australian Standard Geographical Classification (ASGC) Urban Centres Localities, 2006*, Cat. no. 2909.0, Canberra; State and Territory governments (unpublished); table 9A.29.

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### *Effectiveness — access*

Effectiveness of access indicators measure how well the outputs of a service achieves the stated objective(s) of that service in a timely and affordable manner to the community.

#### *State-wide response times*

‘State-wide response times’ is an indicator of governments’ objective of providing accessible and effective ambulance services to communities (box 9.26).

**Box 9.26 State-wide response times**

‘State-wide response times’ is the response time, as defined in box 9.24, for state-wide responses.

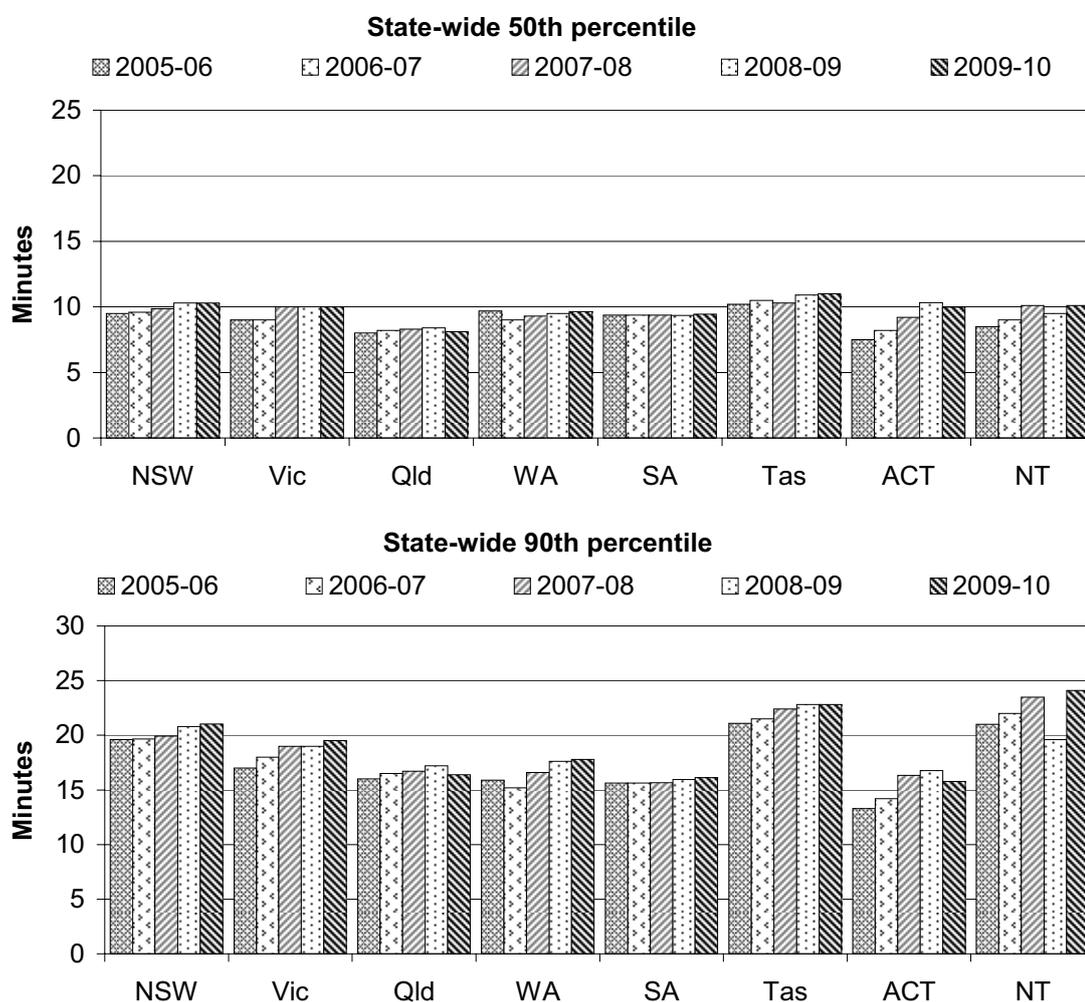
Shorter, or reducing, response times suggest the adverse effects on the community of emergencies requiring ambulance services are reduced.

Data for this indicator are not directly comparable.

Nationally in 2009-10, the time within which 50 per cent of the state-wide first responding ambulance resources arrived at the scene of an emergency in code 1 situations ranged from 8.1 to 11.0 minutes across jurisdictions, and the time within which 90 per cent of the state-wide first responding ambulance resources arrived at the scene of an emergency in code 1 situations ranged from 15.8 to 24.1 minutes across jurisdictions (figure 9.27).

State-wide response times within most jurisdictions remained relatively steady between 2005-06 and 2009-10. Some jurisdictions’ data indicate increases in response times over this 5 year period (table 9A.29).

Figure 9.27 Ambulance response times, state-wide<sup>a, b, c, d, e, f, g</sup>



<sup>a</sup> Response times commence from the following time points: Vic, SA and Tas first key stroke; NSW, Qld and WA transfer to dispatch; and the NT crew dispatched. In 2007-08 the ACT response times commence from the first key stroke, whereas, in 2005-06 to 2006-07 response times commenced from incident creation. Therefore, ACT data across years are not directly comparable. <sup>b</sup> NSW: Did not triage emergency calls prior to 2005-06. Results for code 1 cases represent '000' and urgent medical incidents. A volunteer ambulance service audit was undertaken in 2008-09 which led to improved reporting. <sup>c</sup> Vic: Data are incomplete for 2004-05 due to industrial action in the month of July 2004. The basis of response time reporting changed in 2007-08 and results are not directly comparable with previous years. <sup>d</sup> Qld: Casualty room attendances are not included in response count and, therefore, are not reflected in response times data. Response time calculations for percentages and percentiles for both Capital City and State sourced from Computer Aided Dispatch (CAD) system. <sup>e</sup> WA: Ambulance first responder locations data are not available for 2007-08. <sup>f</sup> SA: Prior to 2006-07 code 1 response times were calculated on all responses to category 1 and 2 cases and based on patient case cards. Code 1 response times for 2006-07 are now calculated from SA Ambulance CAD data and are more aligned to the definitions provided by the CAA. Code 1 response times for 2006-07 exclude second and subsequent vehicles arriving at an incident and exclude incidents where the category of dispatch was upgraded. As a result, the data are not directly comparable with prior years. <sup>g</sup> Tas: a high proportion of population is in small rural areas, relative to other jurisdictions, which may affect average response times.

Source: State and Territory governments (unpublished); table 9A.29.

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### *Triple zero call answering time*

‘Triple zero call answering time’ has been identified for development as an indicator of governments’ objective of providing accessible and effective ambulance services to the community (box 9.27). Data for this indicator were not available for the 2011 Report.

#### **Box 9.27 Triple zero call answering time**

‘Triple zero call answering time’ is yet to be defined.

Data collection for the triple zero call answering time indicator is under development through the CAA.

### *Effectiveness — appropriateness*

Appropriateness indicators measure governments’ objective to deliver ambulance services that meet clients’ needs (box 9.28).

#### **Box 9.28 Performance indicator — appropriateness**

‘Appropriateness’ indicators measure how well services meet clients’ needs.

Appropriateness has been identified as a key area for development in future Reports.

### *Effectiveness — quality — safety*

Quality indicators reflect the extent to which a service is suited to its purpose and conforms to specifications where specific aspects of quality can be reported against.

Safety is the avoidance, or reduction to acceptable levels, of actual or potential harm from ambulance services. Safety has been identified as a key area for development in future Reports.

### *Clinical incidents*

‘Clinical incidents’ has been identified as an overarching indicator of governments’ objective to deliver safe ambulance services to the community (box 9.29).

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**Box 9.29 Clinical incidents**

‘Clinical incidents’ are broadly defined as adverse events that occur because of ambulance service deficiencies and which result in death or serious harm to a patient.

Clinical incidents will incorporate a wider range of categories than sentinel events. (A sentinel event is an adverse event that occurs because of health system and process deficiencies and which results in the death of, or serious harm to, a patient.)

A clinical incidents indicator is to be developed in accordance with national health-wide reporting standards.

*Effectiveness — quality — clinical*

‘Clinical’ indicators measure the effectiveness and quality of clinical interventions and treatments. Clinical indicators have been identified as a key area for development in future reports.

*Clinical interventions and treatments*

‘Clinical interventions and treatments’ has been identified as an overarching indicator of governments’ objective to meet clients’ needs through delivery of quality ambulance services (box 9.30).

**Box 9.30 Clinical interventions and treatments**

‘Clinical interventions and treatments’ is yet to be defined.

In the short to medium term, the clinical dimension is likely to provide indicators of service outputs and outcomes. These indicators are currently under development through the CAA. In the longer term additional clinical measures might include indicators of the effectiveness of ambulance services interventions and treatments.

Current development work is focused on an indicator of ‘cardiac arrest survival to hospital discharge’ in the short term and, in the medium term, an indicator of ‘pain management’ (in the ambulance events outcomes section).

The indicator ‘cardiac arrest survived event rate’ reported in the outcomes section of this chapter has strong links to clinical interventions and treatments.

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### *Effectiveness — quality — responsiveness*

Responsiveness is the provision of services that are client orientated and respectful of clients' dignity, autonomy, confidentiality, amenity, choices, and social and cultural needs.

The indicator 'patient satisfaction' reported in the outcomes section of this chapter has strong links to responsiveness.

### *Effectiveness — quality — continuity*

Continuity is the provision of uninterrupted, timely, coordinated healthcare, interventions and actions across programs, practitioners and organisations. The Steering Committee has identified continuity as a key area for development in future Reports.

#### *Continuity of care*

'Continuity of care' is an indicator of governments' objective to meet clients' needs through delivery of coordinated health care, including ambulance services (box 9.31). No data were available for the 2011 Report.

#### **Box 9.31 Continuity of care**

'Continuity of care' has been broadly defined as transporting the right patient to the right hospital. Some ambulance services are using secondary triage strategies where patients with particular conditions (for example, cardiac and stroke) are transported directly to the hospital or specialised centre where the best treatment for their needs can be provided, rather than transported to the closest hospital where those services may not be available.

This indicator is under development through the CAA.

### *Effectiveness — sustainability*

Sustainability is the capacity to provide infrastructure (that is, workforce, facilities, and equipment) into the future, be innovative and respond to emerging needs of the community.

### Workforce by age group

'Workforce by age group' is an indicator of governments' objective to deliver sustainable ambulance services (box 9.32).

#### Box 9.32 Workforce by age group

'Workforce by age group' is defined as the age profile of the workforce, measured by the proportion of the operational workforce in 10 year age brackets (under 30, 30–39, 40–49, 50–59 and 60 and over). The data are reported as percentages, by jurisdiction.

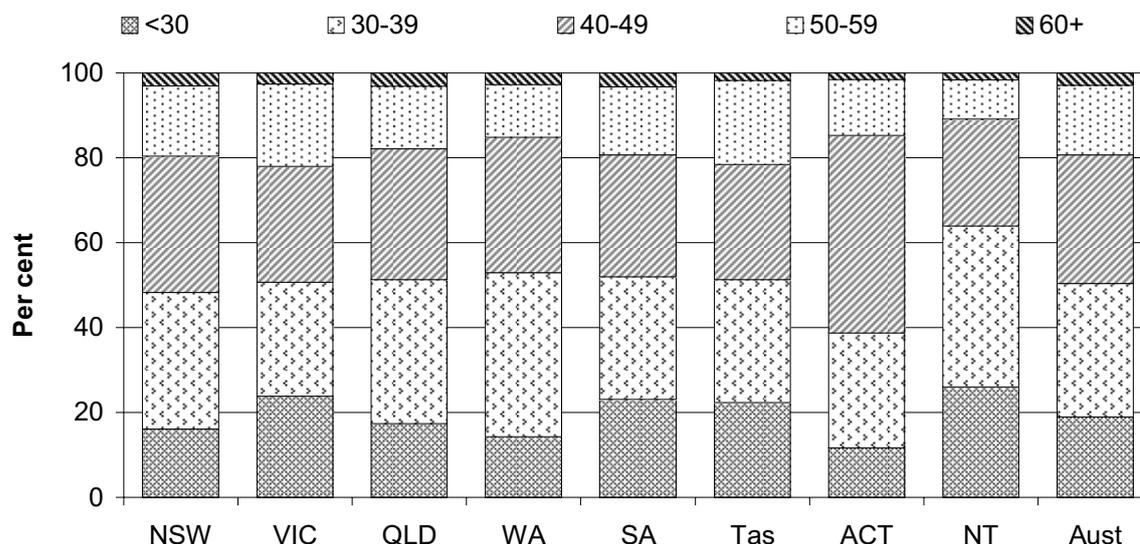
The smaller the proportion of the workforce who are in the younger age groups and/or the larger the proportion who are closer to retirement, the more likely sustainability problems are to arise in the coming decade as the older age group starts to retire.

A three year time series is available in the attachment tables of the 2011 Report.

Data for this indicator are not strictly comparable.

The age profile of the ambulance workforce for each jurisdiction is shown in figure 9.28. Nationally in 2009-10, around 81 per cent of the ambulance workforce were aged under 50. A three year time series is available in attachment table 9A.25.

Figure 9.28 Ambulance workforce, by age group, 2009-10



Source: State and Territory governments (unpublished), table 9A.25.

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## Staff attrition

‘Staff attrition’ is an indicator of governments’ objective to deliver sustainable ambulance services (box 9.33).

### Box 9.33 Staff attrition

‘Staff attrition’ is defined as level of attrition in the operational workforce. It is calculated as the number of FTE employees who exit the organisation as a proportion of the number of FTE employees. It is based on staff FTE defined as ‘operational positions where paramedic qualifications are either essential or desirable to the role’.

Low or decreasing levels of staff attrition are desirable.

Data for this indicator are not strictly comparable.

The proportion of attrition in the ambulance workforce for each jurisdiction is shown in figure 9.29. Nationally, staff attrition fell from 4.9 per cent in 2007-08 to 4.1 per cent in 2009-10.

Figure 9.29 Ambulance staff attrition



Source: State and Territory governments (unpublished), table 9A.25.

## Efficiency

Care needs to be taken when comparing efficiency data across jurisdictions because there are differences in the reporting of a range of cost items and funding arrangements (funding policies and taxing regimes). Some jurisdictions, for example, have a greater proportion of government funding relative to levies

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compared with other jurisdictions. Also, differences in geographic size, terrain, climate, and population dispersal may affect costs of infrastructure and numbers of service delivery locations per person.

*Ambulance service organisations' expenditure per person*

'Ambulance service organisations' expenditure per person' is an indicator of governments' objective to deliver efficient ambulance services (box 9.34).

**Box 9.34 Ambulance service organisations' expenditure per person**

'Ambulance service organisations expenditure per person' is defined as ambulance service organisations expenditure divided by the population. Expenditure, and funding, per person are employed as proxies for efficiency. Two measures are reported:

- total expenditure (from all government and non-government sources) on ambulance service organisations per person — this measure indicates efficiency of use of resources from all sources
- total government grants and indirect government funding of ambulance service organisations per person — this measure indicates efficiency of use of resources from government sources.

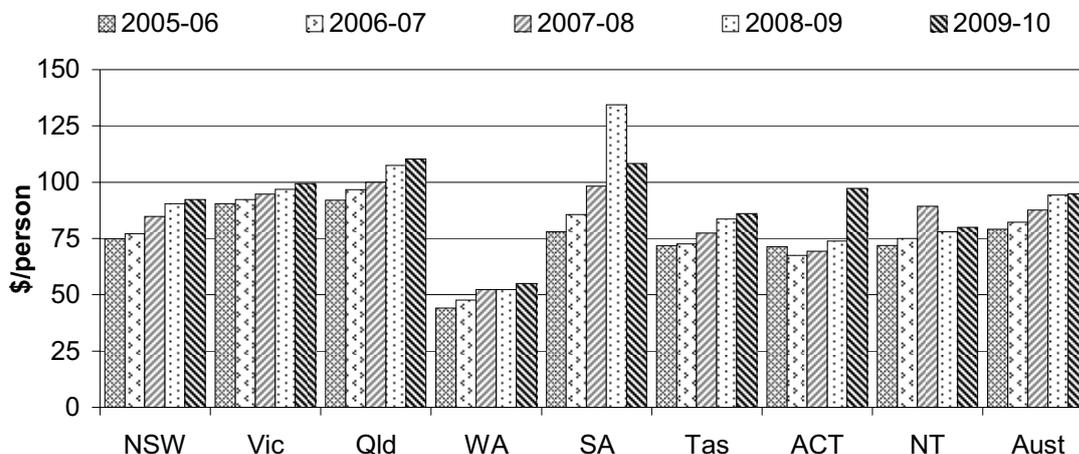
Holding other factors constant, a decrease in expenditure per person represents an improvement in efficiency. However, efficiency data are difficult to interpret. Although high or increasing expenditure per person may reflect deteriorating efficiency, it may also reflect changes in aspects of the service (such as improved response) or changes in the characteristics of emergencies requiring ambulance services (such as more serious para-medical challenges). Similarly, low or declining expenditure per person may reflect improving efficiency or lower quality (slower response times) or less severe cases.

Data for this indicator are not directly comparable.

Nationally, total expenditure on ambulance service organisations per person was \$94.85 in 2009-10 (figure 9.30).

Nationally, total government grants and indirect government funding of ambulance service organisations per person was \$63.07 in 2009-10 (figure 9.31).

**Figure 9.30 Ambulance service organisations expenditure per person (2009-10 dollars)<sup>a, b, c, d, e</sup>**

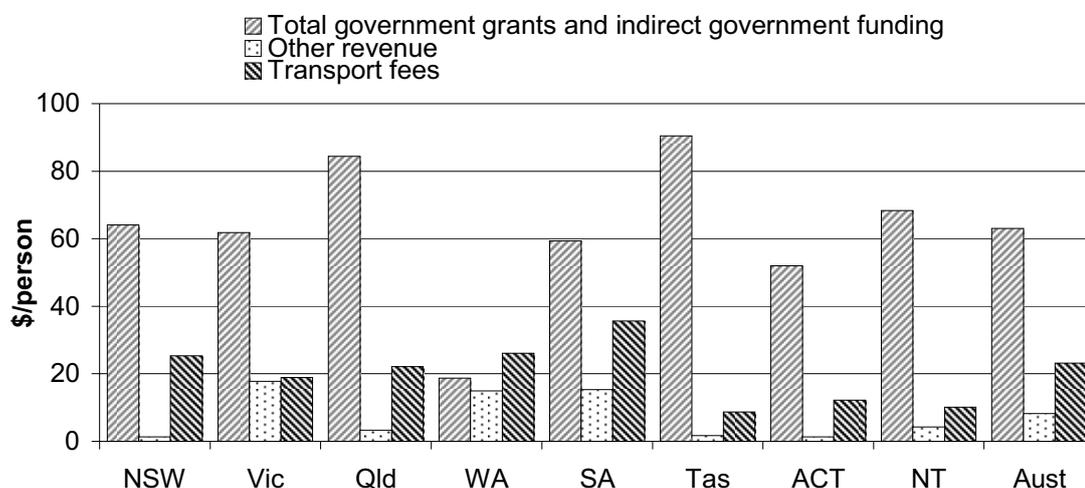


<sup>a</sup> Data are adjusted to 2009-10 dollars using the GDP price deflator (2009-10 = 100) (table AA.26).

<sup>b</sup> Historical rates in this figure may differ from those in previous Reports. Population data are revised using Final Rebased ERP data following each Census of Population and Housing (the most recent census was 2006). Financial year population estimates are the midpoint estimate of the relevant financial year (that is, as at 31 December). <sup>c</sup> WA and NT: use a contracted service model for ambulance services. <sup>d</sup> SA: 2008-09 data reflect three significant events that year: (1) increase in wages (2) subsequent back pay paid to frontline paramedics as a result of the 'work value' case (from the 2007 enterprise bargaining agreement) reaching finalisation and (3) an increase in the number of frontline paramedics recruited. <sup>e</sup> ACT: For 2005-06 and later years, ACT Ambulance Service data are collated using the new Emergency Services Agency Capability Model, which utilises a different cost attribution model for shared costs across the Emergency Services Agency. Therefore, the financial figures for 2005-06 and later years cannot be directly compared with those of previous years.

Source: State and Territory governments (unpublished); table 9A.32.

Figure 9.31 **Sources of ambulance service organisations revenue per person, 2009-10<sup>a</sup>**



<sup>a</sup> Other revenue is equal to the sum of subscriptions, donations and miscellaneous revenue.

Source: State and Territory governments (unpublished); table 9A.33.

### *Expenditure per urgent and non-urgent response*

‘Expenditure per urgent and non-urgent response’ has been identified for development as an indicator of governments’ objective to deliver efficient ambulance services (box 9.35).

#### **Box 9.35 Expenditure per urgent and non-urgent response**

‘Expenditure per urgent and non-urgent response’ is yet to be defined. This indicator is under development through the CAA. Data for this indicator were not available for the 2011 Report.

### *Outcomes*

Outcomes are the impact of services on the status of an individual or group (while outputs are the services delivered) (see chapter 1, section 1.5).

### *Cardiac arrest survived event rate*

‘Cardiac arrest survived event rate’ is an indicator of governments’ objective to deliver effective ambulance services (box 9.36).

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### Box 9.36 **Cardiac arrest survived event rate**

'Cardiac arrest survived event rate' is defined as the percentage of patients aged 16 years and over who:

- were in out-of-hospital cardiac arrest (excluding paramedic witnessed)
- where any chest compressions and/or defibrillation was undertaken by ambulance/Emergency Medical Services (EMS) personnel, and
- who have a return to spontaneous circulation (ROSC) on arrival at hospital.

For the out-of-hospital setting, a survived event means a sustained ROSC with spontaneous circulation (that is, the patient having a pulse) until administration and transfer of care to the medical staff at the receiving hospital (Jacobs, et al. 2004).

A further disaggregation of this indicator is defined as the percentage of patients aged 16 years and over who:

- were in out-of-hospital cardiac arrest (excluding paramedic witnessed)
- where the arrest rhythm on the first ECG assessment was either Ventricular Fibrillation or Ventricular Tachycardia (VF/VT), and
- who have a return of spontaneous circulation (ROSC) on arrival at hospital.

Patients in Ventricular Fibrillation (VF) or Ventricular Tachycardia (VT) are more likely to have better outcomes compared with other causes of cardiac arrest as these conditions are primarily correctable through defibrillation.

Paramedic witnessed cardiac arrests are included in the measures reported to show that cardiac arrests that are treated immediately by the paramedic have a better likelihood of survival due to this immediate and rapid intervention. This is substantially different to cardiac arrests occurring prior to the ambulance arriving where such increasing periods of treatment delay are known to negatively influence outcome.

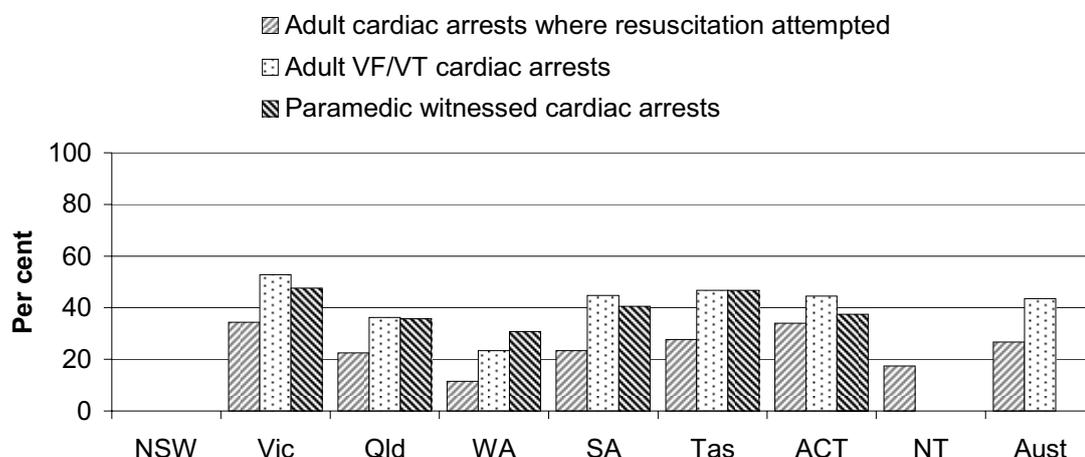
A higher or increasing rate for each measure is desirable. Data and associated measures for this indicator are not directly comparable.

The survival rate from out-of-hospital witnessed cardiac arrests varied across jurisdictions in 2009-10 (figure 9.32).

Cardiac arrest data reported in figure 9.32 are not comparable across jurisdictions and the CAA is undertaking a review to improve data comparability for this indicator.

Available data on the further breakdown of this indicator are reported in attachment table 9A.28. Time series data, where available, are also provided in attachment table 9A.28.

Figure 9.32 Cardiac arrest survived event rate, 2009-10<sup>a, b, c, d, e, f, g</sup>



<sup>a</sup> A 'survived event' is defined as the patient having return of spontaneous circulation (ROSC) on arrival to hospital (that is, the patient having a pulse). This is not the same as the patient surviving the cardiac arrest as having ROSC is only one factor that contributes to the overall likelihood of survival. <sup>b</sup> The measure 'adult cardiac arrests where resuscitation attempted' provides an overall indicator of outcome without specific consideration to other factors known to influence survival. <sup>c</sup> NSW: Data consistency issues mean that this measure is unable to be reported in 2009-10. NSW is awaiting the development of a national methodology for calculation of this measure prior to revising its internal processes. <sup>d</sup> Vic: Excludes patients with unknown rhythm on arrival at hospital. <sup>e</sup> WA: Data are provided for the capital city only. Cardiac Arrest survival figures are only populated to Mar-10. <sup>f</sup> NT: For 2008-09 VF/VT arrests data are not available. <sup>g</sup> Cardiac arrest data are not comparable between jurisdictions due to different methods of reporting. Data are only comparable between years for each individual jurisdiction (unless caveats say otherwise).

Source: State and Territory governments (unpublished); table 9A.28.

### Cardiac arrest survival to hospital discharge

'Cardiac arrest survival to hospital discharge' has been identified for development as an indicator of governments' objective to deliver effective ambulance services (box 9.37).

#### Box 9.37 Cardiac arrest survival to hospital discharge

'Cardiac arrest survival to hospital discharge' is yet to be defined.

A higher or increasing rate is a desirable outcome.

This indicator is under development through the CAA. Data for this indicator were not available for the 2011 Report.

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### *Pain management*

'Pain management' has been identified for development as an indicator of governments' objective to deliver effective ambulance services (box 9.38).

#### **Box 9.38 Pain management**

'Pain management' is yet to be defined.

This indicator is under development through the CAA. Data for this indicator were not available for the 2011 Report.

### *Level of patient satisfaction*

'Level of patient satisfaction' is an indicator of governments' objective to deliver responsive ambulance services (box 9.39). The performance of ambulance service organisations can be measured in terms of the satisfaction of those people who directly used the service.

#### **Box 9.39 Level of patient satisfaction**

'Level of patient satisfaction' is defined as the total number of patients who were either 'satisfied' or 'very satisfied' with ambulance services they had received in the previous 12 months, divided by the total number of patients that responded to the *National Patient Satisfaction Survey* (CAA 2010).

A higher level or increase in the proportion of patients who were either 'satisfied' or 'very satisfied' suggests greater success in meeting patient needs.

This indicator does not provide information on why some patients were not satisfied. It also does not provide information on the level of patient expectations.

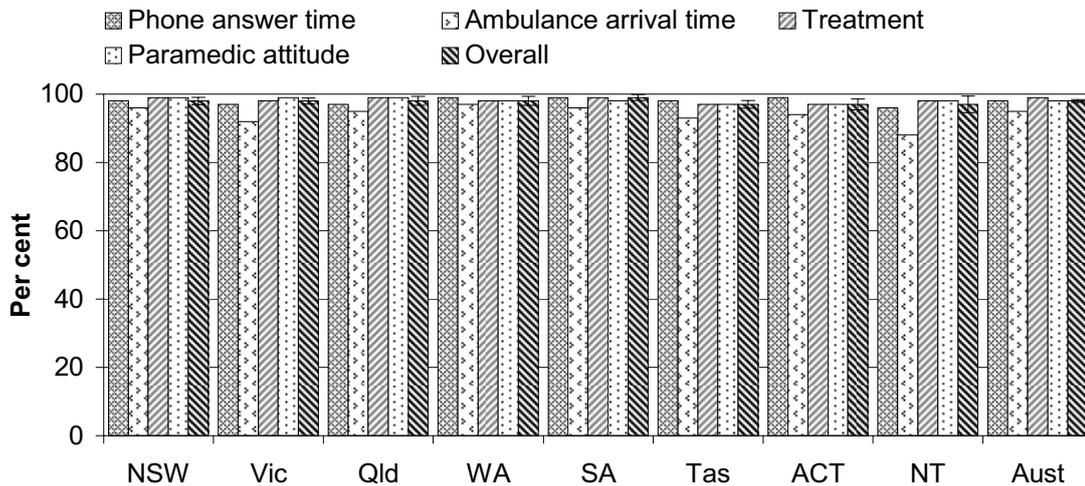
Data for this indicator are comparable.

Data for 2006 to 2010 were collected by jurisdictions and collated by the CAA. The CAA survey obtained 4503 usable responses nationally from patients who used an ambulance service in 2010 (table 9A.30).

The estimated overall satisfaction levels for ambulance patients were similar across all jurisdictions and all years (time series data are reported in table 9A.30). Standard errors for the 95 per cent confidence interval, available with 2009 and 2010 patient satisfaction data, indicate that there are no statistically significant differences between jurisdictions for overall patient satisfaction. Similarly, there are small

differences between jurisdictions for particular aspects of the ambulance service (figure 9.33).

**Figure 9.33 Proportion of ambulance users who were satisfied or very satisfied with the ambulance service, 2010<sup>a</sup>**



<sup>a</sup> Based on a survey of people who used an ambulance service in the previous 12 months. Jurisdictions conducted the surveys at various times during each year. Standard errors for the 95 per cent confidence interval for overall patient satisfaction are included for 2010.

Source: CAA 2006–10 *National Patient Mailout Satisfaction Research*; table 9A.30.

## 9.6 Future directions in performance reporting

A number of developments are underway to improve the comparability and accuracy of data, and to expand the scope of reporting on emergency services. Performance indicators for fire, road crash rescue and ambulance services are being improved with the assistance of the Australasian Fire and Emergency Service Authorities Council (AFAC), the ACSES and the CAA.

### Fire events

Performance measures are currently being developed for the reporting of fires in the landscape. The long-term aim is to report annually on the measures for each relevant jurisdiction across Australia. The key landscape fire performance measures that have been agreed to in concept, subject to the availability of data, for inclusion in future editions of the Report are:

- landscape fire deaths per 100 000 people
- landscape fire injuries per 100 000 people

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and, subject to identification of appropriate denominators to facilitate comparative reporting:

- number of primary dwellings affected by wildfire
- total number of hours by volunteers on wildfire suppression.

The focus of current work is on developing agreed data definitions and identifying appropriate data sources.

### **Road crash rescue events**

An updated performance indicator framework was included in the 2010 Report, along with text to provide a more comprehensive picture of the strategies and programs delivered by governments to reduce the impact of road trauma.

The section continues to provide road crash rescue information on the number of road crash rescue incidents and the number of events in which extrications occurred, and to reference other sections of the Report where data relevant to the performance indicator framework for road crash rescue events are published. Nevertheless, the challenge remains to demonstrate the cost, benefits and value of the full range of emergency risk management services related to road trauma. In this context, information on the cost of road crashes in Australia has been included in box 9.21 (BITRE 2009).

The focus of development work in the immediate future will be to derive indicator definitions, identify appropriate measures and develop data for reporting against the preparedness and response elements of the emergency management performance indicator framework.

### **Ambulance events**

Ambulance event reporting continues to focus upon further developing the indicators introduced to the 2009 Report. This will entail continuing development and implementation of data collections for some indicators, and refining those indicators that already have data reported, with ongoing work to increase data completeness and comparability.

### **Other event types**

Other event type services for which performance reporting has yet to be developed include: rescues (other than road crash rescues); natural emergency events (other

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than landscape fires); emergency relief and recovery; and quarantine and disease control.

## **9.7 Jurisdictions' comments**

This section provides comments from each jurisdiction on the services covered in this chapter.

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## New South Wales Government comments

“ The NSW Government continues its commitment to reducing death and injury, and the social, economic and environmental impacts caused by emergencies. In 2009-10, the Commonwealth and NSW signed a National Partnership Agreement on Natural Disaster Resilience providing \$7.9 million in grants, managed by Emergency Management NSW (EMNSW), to reduce the impact of natural disasters and increase agencies' capabilities to prepare for, prevent, respond to and recover from disasters. EMNSW continued to administer more than 140 projects under the legacy Natural Disaster Mitigation Program.

In 2009-10, the Ambulance Service of NSW provided over 1.1 million emergency and other responses, or 3104 per day. The establishment of the Ambulance Research Institute has filled a significant gap in pre-hospital clinical research. Operational changes include the introduction of Special Operations Team paramedics to expand rapid response capability. IT upgrades, state-wide standardisation of Control Centre procedures and a new training curriculum have significantly improved call handling capacity. New equipment now in use includes mechanical restraint devices, 60 new stretchers and a further two Megalift vehicles for use in bariatric and special operations. The Ambulance Service has also implemented initiatives focussing on staff welfare to promote positive cultural change and a healthy, supportive workplace environment.

In 2009-10, the NSW Rural Fire Service (RFS) implemented a comprehensive public awareness campaign, *Prepare.Act.Survive*, to inform households how to prepare and plan for bush fires. The bush fire information line was upgraded to increase call-taking capacity and overflow arrangements were negotiated with the NSW Police Force. Bush fire mitigation crews, boosted by an additional 58 staff, completed 354 hazard reduction works, including 409 jobs for the Assist Infirm, Disabled and Elderly Residents (AIDER) program. The RFS conducted over 2000 community education events and opened six new or refurbished fire control centres. In 2009-10, the NSW Fire Brigades (NSWFB) made significant advances in community safety, emergency response and operational preparedness. Firefighters responded to a total of 135 278 calls. The NSWFB continued its major community partnerships with McDonald's and GIO, enabling it to deliver more fire prevention programs including the new 'After the fire' Recovery Kit and BrigadeKids CD and website. Significant organisational and cultural reform is also underway, to build a safer and healthier workplace.

The NSW State Emergency Service (SES) committed 403 786 hours to operational response in 2009-10, including responding to 117 flood rescues, and significant flood response operations in western NSW. Two tsunami warnings were issued, and the response arrangements were effective in alerting key agencies of the possible threat. Personnel were deployed to Melbourne and Perth to assist interstate counterparts with storm recovery operations. The SES provided a road crash capability through 83 Road Crash Rescue Units. It provided support for the community first responder program, in conjunction with the Ambulance Service of NSW, with 10 Community First Responder Units.

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## Victorian Government comments

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On 16 February 2009, the Victorian Government established the 2009 Victorian Bushfires Royal Commission to investigate the causes and responses to the bushfires which swept through parts of Victoria in late January and February 2009.

The Royal Commission's Interim Report and Final Report were handed down on 17 August 2009 and 31 July 2010 respectively and the Victorian Government is now well advanced in revising its bushfire safety policy.

The Royal Commission's recommendation that people in bushfire prone areas need a range of safety options will be a key feature of the policy. These options include leaving early; defending a well prepared home; and shelter options such as Neighbourhood Safer Places and private bushfire shelters. The suitability of these options for each community will be determined through community engagement and local planning.

Victorian Government has also established a Fire Services Commissioner responsible for the overall response to major fires in Victoria. The Commissioner will work with the fire services agencies to refine the Command and Control Arrangements for Bushfires in Victoria and to develop appropriate delegations of the control responsibility as envisaged by the Royal Commission.

During the year, Victoria's ambulance service capability was enhanced by the opening of several new branches and station upgrades as well as the introduction of single MICA paramedic responders in metropolitan Melbourne and the major rural cities of Ballarat, Bendigo, Geelong and the La Trobe Valley.

The Government's investment in high quality ambulance services is continuing through an additional \$56 million investment over four years targeted at rural and regional Victoria.

Ambulance Victoria's operational capability is also being enhanced through the transfer of its rural communication centres to a single centre managed by Victoria's Emergency Services Telecommunications Authority (ESTA).

ESTA has a statutory accountability for handling Triple Zero calls and also provides and manages the operational communications for the dispatch of police, fire, metropolitan ambulance services and State Emergency Services in Victoria.

On Saturday 6 March 2010, severe thunderstorms developed over Victoria with a major 'super cell' unleashing an intense hailstorm. Many areas of Victoria were subjected to high winds, very heavy rainfall, lightning and damaging hailstorms up to 100 millimetres in diameter with the majority of damage caused by flash flooding due to the high rainfall.

ESTA reports that Saturday, 6 March represents the third highest tally of daily call presentations in its history.

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## Queensland Government comments

“ Following a review of the *Disaster Management Act 2003*, which commenced in 2009, Queensland’s disaster management framework will be strengthened to deliver better response outcomes for communities impacted by disaster.

Queensland has been increasing its focus on building community resilience in recent years, due to a rise in the number and severity of natural disaster events. The Natural Disaster Resilience Program (NDRP), funded under the National Partnership Agreement (NPA) on Natural Disaster Resilience, aims to reduce communities’ vulnerability to natural hazards by supporting local governments and other stakeholders to build community resilience. Round 1 of the NDRP in Queensland saw 38 projects approved at an allocation of over \$7 million, targeting key risks identified in the State’s natural hazard risk profile.

In 2009-10, Natural Disaster Relief and Recovery Arrangements were activated four times, covering 99.8 per cent of the State, in response to cyclone, storm, flood and bushfire events with a total estimated cost exceeding \$1.246 billion. The Bureau of Meteorology predicts Queensland could experience up to six cyclones over the 2010-11 summer and well above average rainfalls with potential flooding due to the La Nina climate phase which is expected to continue into at least early 2011. Queensland is preparing for one of the most potentially busy storm seasons since the 1970s.

Following release of the 2009 Victorian Bushfires Royal Commission interim recommendations, Queensland successfully integrated ‘Emergency Alert’ into disaster notification protocols under the NPA on the Development of a Telephone-Based National Emergency Warning System. ‘Emergency Alert’ utilises SMS capability to provide early warnings of disaster to communities via address-based landlines and mobile telephones. Additionally, the Queensland Fire and Rescue Service (QFRS) developed the PREPARE.ACT.SURVIVE. campaign which includes new national standards such as the Bushfire Danger Ratings.

A substantial amount of time and resources is dedicated by the QFRS into partnering with the community to mitigate risks through education and fire safety activities. These activities have seen the number of accidental residential structure fires contained, despite an increasing population. Following the introduction of revised road crash rescue protocols in September 2009, aimed at reducing unnecessary attendance by the QFRS at mobile property crashes, attendance by the QFRS at traffic incidents has also reduced.

Demand management continued to be a focus of the Queensland Ambulance Service in 2009-10, with achievements including: commencement of the Secondary Triage and Referral pilot system, an alternative response to low acuity Triple Zero (000) callers that rigorously assesses and matches callers’ needs with resources; commencement of the Queensland Health Authorised Transport arrangements; and recruitment of an additional 50 officers bringing the total number of additional officers recruited from 1 July 2007 to 30 June 2010 to 555.

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## Western Australian Government comments

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The Fire and Emergency Services Authority of WA (FESA) delivers emergency services throughout the State via a network of regionally-based FESA resources and with the support of local volunteers.

During 2009-10, we faced significant challenges from natural hazards with large scale incidents including Tropical Cyclone Laurence, the Toodyay and Badgingarra bushfires, the West Coast storm and a magnitude 5 earthquake. These incidents resulted in significant losses, with 38 properties destroyed during the Toodyay bushfire, damage to heritage listed buildings from the earthquake and more than \$10 million damage caused by the West Coast storm.

Crews from fire services and the State Emergency Service worked together in the response efforts, and appreciated the high level of support provided by other government agencies, including interstate support for the West Coast storm.

FESA focussed this year on reviewing bushfire risk across Western Australia to ensure effective mitigation and capacity to provide timely and efficient response. The impacts of recommendations resulting from the Victorian Bushfire Royal Commission are being assessed by an interagency bushfire committee. Meanwhile, we continued with established mitigation strategies such as the Kimberley Fire Management program and implemented new initiatives for the management of Unallocated Crown Land and Unmanaged Reserves.

Building the capacity of staff and volunteers, as well as community stakeholders is a key strategic objective. The receipt of additional funding for the ongoing provision of a second Type 1 helicopter to support bushfire response in the South West of our State was a key achievement. In addition, enhanced support was provided to local governments through the extension of the Community Fire Manager and Community Emergency Services Manager program.

The introduction of enhanced community information systems, including StateAlert, increased capacity to provide online information during significant emergencies and timely provision of information on Total Fire Bans and weather alerts will support continued improvements to community preparedness.

Road ambulance services are delivered by non government providers for most of the State with St John Ambulance the principal provider.

WA reported a 12.8 per cent increase in emergency ambulance responses and a 7.7 per cent increase in urgent ambulance responses. The number of patients transported was up 6.6 per cent to 189 199.

Ambulance services in rural and remote communities remain largely dependent upon volunteers. Almost 3 000 volunteers play an important role as ambulance operatives or ambulance operational and business support staff. The number of community first responders increased 18.7 per cent to 559.

Increasing workload and hospital blockage leading to ramping of ambulance vehicles continue to have an impact on response capacity and response times.

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## South Australian Government comments

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To improve public safety the SA Government published a *Strategic Direction 2008-2014 Statement* for fire and emergency services that commits the sector to Community Engagement, Seamless Integration, Improved Communication, Building Partnerships, Improving Community Resilience and Being Accountable.

Several key projects and initiatives were undertaken during 2009-10 including:

- amending the *Fire and Emergency Services Act 2005* to further refine governance and legislative arrangements and support the recommendations for operational improvements identified in the Bushfire Management Review; and the Wangary Bushfire Coronial Inquest
- developing SAFECOM's Strategic Plan 2010–2015
- implementing initiatives and recommendations of SA's Bushfire Task Force established to examine the issues arising from the Royal Commission into the Victorian bushfires of 7 February 2009.

**SA Ambulance Service (SAAS)** - Highlights for 2009-10 included:

- expanding the Extended Care Paramedic (ECP) program across the metropolitan area, increasing the number of qualified ECPs to 18
- opening new stations in Port Adelaide and Quorn, with construction of a new station in Prospect well underway
- continuing the rollout of initiatives identified in *Defining the road ahead: Service Delivery Model (2008-2012)*, including the implementation of automatic vehicle location (AVL) systems and expanding the volunteer-supported crewing model
- developing a new strategic plan, *Vision 2015*
- achieving satisfied or very satisfied service level ratings by 99 per cent of patients surveyed (CAA National Patient Satisfaction Research)
- achieving emergency response time targets.

**Fire, emergency and ambulance service** initiatives for 2010-11 include:

- enhancing a new telephone and text messaging warning system
- enhancing a new national framework for fire warnings
- participating in the SA Computer Aided Dispatch (SACAD) project to provide new computer aided dispatch systems
- promoting long-term retention and recruitment of volunteers
- working closely with the Council of Ambulance Authorities and the Australasian Fire Authorities Councils' initiatives for service excellence.

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### **Tasmanian Government comments**

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Tasmania has a number of unique characteristics that influence the provision of emergency services throughout the State and affect response/turnout times and infrastructure costs. These characteristics include a small and dispersed population, diseconomies of scale, reliance on a network of dedicated volunteers in rural and remote areas and the State's rugged topography. Tasmania's two major urban centres have low population density compared to the large urban centres in other states.

Tasmania's data includes both urban and rural fire and ambulance service performance. As Tasmania has the highest percentage of all jurisdictions of its population in rural areas and the lowest proportion (34.9 per cent, compared to a national average of 68 per cent) in highly accessible areas, reliable comparisons of response performance to other jurisdictions are difficult.

Tasmania Fire Service (TFS) comprises four career brigades and 229 volunteer brigades that respond to fires in all metropolitan and rural areas. Tasmania reports all incidents attended by these brigades, and the TFS bears the full cost of funding both the operating and capital costs of its brigades.

TFS continues to deliver a broad range of educational and promotional programs to assist at-risk sectors of the community prevent fires and minimise the impact of fires that occur. Figures including independent survey results indicate that fire-safety programs targeting at-risk households are particularly effective, with significant decreases in house fire rates over the last 10 years.

TFS was assigned responsibility for road crash rescue in and around metropolitan areas in 2006-07. State Emergency Services (SES) continue to provide road crash rescue services for rural areas.

Ambulance Tasmania (AT) provides emergency ambulance care, medical retrieval services and a non-emergency patient transport service. In addition, AT provides fixed-wing and staff for helicopter aero-medical services.

Tasmania is currently the only State that provides a free-of-charge ambulance service to the public and consequently there is a far greater reliance on government funding for ambulance services than in all other jurisdictions. The State Government has increased funding to improve services in both urban and rural areas.

Tasmania continues to enjoy a high level of ambulance patient satisfaction. This factor reflects positively on its ambulance personnel.

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### **Australian Capital Territory Government comments**

“ The ACT Emergency Services Agency (ESA), which is part of the Department of Justice and Community Safety, comprises the ACT Ambulance Service, the ACT Fire Brigade, the ACT Rural Fire Service and the ACT State Emergency Service along with emergency management and support areas. It also incorporates the affiliated Snowy Hydro Southcare aeromedical service.

The ACT ESA provides services across a broad geographic base to encompass the Bush Capital Planning Model. This geographic spread provides challenges to meet benchmark response standards and community expectations.

Over the past twelve months the ESA has continued to foster the ‘all hazards all agencies’ approach to delivering emergency services and emergency management for the ACT and surrounding region. The operational capability of the ESA was further improved or enhanced through the continued work of the following key projects:

- finalisation of a new purpose built headquarters incorporating a state of the art workshop, with all services and support functions co-located
- continuing commitment to the operation of Snowy Hydro Southcare aeromedical services with NSW
- significant training initiatives to further staff and volunteer capabilities
- finalising a strategic station relocation feasibility study
- finalising the construction of a multi agency training facility.

During 2009-10 the four services of the ACT Emergency Services Agency provided in excess of 47 900 responses to incidents within the ACT as well as eight Remote Area Firefighting Teams to assist with fire suppression in the Blue Mountains, Hawkesbury Shire and Armidale. The ACT Rural Fire Service also provided support to the NSW Rural Fire Service during the year.

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## Northern Territory Government comments

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At the commencement of the 2010 fire season in the Top End, the NT Fire and Rescue Service (NTFRS) introduced new bushfire management arrangements covering several recommendations from the Interim Report of the Victorian Bushfire Royal Commission. Specifically, the NT adopted the nationally agreed theme of PREPARE-ACT-SURVIVE to replace the ‘Stay or Go’ policy. A new public information and warning system, in collaboration with Bushfires NT and the ABC, and a re-aligned Fire Danger Rating scale, in league with the Bureau of Meteorology, incorporating a new category of ‘Catastrophic’ for fire danger index of 100 and above, were also implemented. Information about the changes was posted on the NTFRS website and fact sheets and publications were distributed through public media events.

The National Emergency Alert System became operational in the NT on 1 March 2010. The Emergency Alert is a telephone warning system that may be used in a life threatening, large scale emergency to send alerts via landline telephones and mobile phones, based on the handset’s registered address. A trial was conducted in Palmerston in late February, with a significant number of residents contacting the Emergency Operation’s Centre to confirm the alert had been received.

The NTFRS saw a reduction in landscape fires in 2009-10. Much of this decrease can be attributed to the continuing benefit of an enhanced cool season strategic hazard reduction burning program. Under this program significant grassfire risk in the urban/rural interface is identified and minimised or eliminated through a combination of weed control and prescribed fire.

The NT Government is committed to the recruitment of 40 additional fire fighters. In 2009-10, 23 new fire fighters graduated and joined the service.

A NTFRS and NT Emergency Service joint Urban Search and Rescue (USAR) facility was completed in Darwin which provides urban search and rescue technicians with realistic scenarios. With over 17 voids of various sizes interconnected by tunnels, the facility has proven to be an excellent confined space and vertical rescue training venue.

Major activities for NT Emergency Service over the reporting period included assisting with the response to Tropical Cyclone Paul, which was active in the Western side of the gulf of Carpentaria. The Cyclone caused extensive flooding in East Arnhemland, storms in Alice Springs which caused flooding and storm damage responses, and a number of marine and inland searches throughout the Territory.

Tropical Cyclone Community Service radio announcements and Talking Posters, in nine Indigenous languages, have now been introduced as part of the Territory’s emergency public education.

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## 9.8 Definitions of key terms and indicators

<b>Alarm notification not involving fire</b>	Fire alarm notification due to the accidental operation of an alarm, the failure to notify fire services of an incorrect test by service personnel or a storm induced voltage surge.
<b>All agencies</b>	<p>All agencies should be involved to some extent in emergency management. The context of emergency management for specific agencies varies and may include:</p> <ul style="list-style-type: none"><li>• ensuring the continuity of their business or service</li><li>• protecting their own interests and personnel</li><li>• protecting the community and environment from risks arising from the activities of the organisation</li><li>• protecting the community and environment from credible risks.</li></ul> <p>Emergency management measures may be referred to in a number of organisational and community contexts, including risk management, environmental management, occupational health and safety, quality management, and asset management.</p>
<b>All hazards</b>	<p>The all hazards approach concerns arrangements for managing the large range of possible effects of risks and emergencies. This concept is useful to the extent that a large range of risks can cause similar problems and such measures as warning, evacuation, medical services and community recovery will be required during and following emergencies. Many risks will, however, require specific response and recovery measures and will almost certainly require specific prevention and mitigation measures.</p>
<b>Ambulance community first responders</b>	<p>A type of volunteer that provide an emergency response (with no transport capacity) and first aid care before the ambulance arrival.</p>
<b>Ambulance service response times</b>	<p>The response time is defined as the time taken between the initial receipt of the call for an emergency ambulance and the ambulance's arrival at the scene of the emergency. Emergency responses are categorised by an assessment of the severity of the medical problem:</p> <ul style="list-style-type: none"><li>• code 1 — responses to potentially life threatening situations using warning devices</li><li>• code 2 — responses to acutely ill patients (not in life threatening situations) where attendance is necessary but no warning devices are used.</li></ul> <p>Response times are reported as percentiles in this report.</p>
<b>Ambulance expenditure</b>	<p>Includes salaries and payments in the nature of salaries to ambulance personnel, capital expenditure (such as depreciation and the user cost of capital) and other operating expenditure (such as running expenditure, contract expenditure, provision for losses and other recurrent expenditure). Excludes interest on borrowings.</p>
<b>Ambulance incident</b>	<p>An event that results in one or more responses by an ambulance service.</p>
<b>Ambulance non-government revenue</b>	<p>Includes revenue from subscription fees, transport fees, donations and other non-government revenue. Excludes funding revenue from Australian, State and local governments.</p>
<b>Ambulance patient</b>	<p>A person assessed, treated or transported by the ambulance service.</p>

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<b>Ambulance personnel</b>	Any person employed by the ambulance service provider who delivers an ambulance service, manages the delivery of this service or provides support for the delivery of this service. Includes salaried ambulance personnel, remunerated volunteer and nonremunerated volunteer ambulance personnel.
<b>Ambulance response</b>	A vehicle or vehicles sent to an incident. There may be multiple responses/vehicles sent to a single incident.
<b>Ambulance services</b>	Provide emergency and non-emergency pre-hospital and out-of-hospital patient care and transport, inter-hospital patient transport, specialised rescue services, ambulance services to multi-casualty events, and community capacity building to respond to emergencies.
<b>Availability of ambulance officers/paramedics</b>	The number of full time equivalent ambulance officers/paramedics per 100 000 people. Ambulance officers/paramedics includes student and base level ambulance officers and qualified ambulance officers but excludes patient transport officers.
<b>Cardiac arrest survived event rate</b>	For the out-of-hospital setting, survived event rate means sustained return of spontaneous circulation (ROSC) with spontaneous circulation until administration and transfer of care to the medical staff at the receiving hospital (Jacobs, et al. 2004)
<b>Community first responder</b>	See 'Ambulance community first responders'
<b>Emergency ambulance response</b>	An emergency ambulance response (code 1) to a pre-hospital medical incident or accident (an incident that is potentially life threatening) that necessitates the use of ambulance warning (lights and sirens) devices.
<b>Events in which extrication(s) occurred</b>	An event in which the assisted removal of a casualty occurs. An incident with multiple people extricated is counted the same as an incident with one person extricated.
<b>Extrication</b>	Assisted removal of a casualty.
<b>False report</b>	An incident in which the fire service responds to and investigates a site, and may restore a detection system.
<b>Fire death</b>	A fatality where fire is determined to be the underlying cause of death. This information is verified by coronial information.
<b>Fire death rate</b>	The number of fire deaths per 100 000 people in the total population.
<b>Fire expenditure</b>	Includes salaries and payments in the nature of salaries to fire personnel, capital expenditure (such as depreciation and the user cost of capital) and other operating expenditure (such as running expenditure, training expenditure, maintenance expenditure, communications expenditure, provision for losses and other recurrent expenditure). Excludes interest on borrowings.
<b>Fire incident</b>	A fire reported to a fire service that requires a response.
<b>Fire injury</b>	An injury resulting from or relating to a fire or flames, requiring admission to a public or private hospital. Excludes emergency department outpatients and injuries resulting in a fire death.
<b>Fire injury rate</b>	The number of fire injuries per 100 000 people in the total population.
<b>Fire personnel</b>	Any person employed by the fire service provider who delivers a firefighting or firefighting-related service, or manages the delivery of this service. Includes paid and volunteer firefighters and support personnel.

<b>Fire safety measure</b>	<ul style="list-style-type: none"> <li>• Operational smoke alarm or detector</li> <li>• Fire sprinkler system</li> <li>• Safety switch or circuit breaker</li> <li>• Fire extinguisher</li> <li>• Fire blanket</li> </ul>	<ul style="list-style-type: none"> <li>• Fire evacuation plan</li> <li>• External water supply</li> <li>• The removal of an external fuel source</li> <li>• External sprinkler</li> <li>• Other fire safety measure.</li> </ul>
<b>Indirect revenue</b>	All revenue or funding received indirectly by the agency (for example, directly to Treasury or other such entity) that arises from the agency's actions.	
<b>Landscape fires</b>	Vegetation fires (for example, bush, grass, forest, orchard and harvest fires), regardless of the size of the area burnt.	
<b>Median dollar loss per structure fire</b>	The median (middle number in a given sequence) value of the structure loss (in \$'000) per structure fire incident.	
<b>Non-urgent ambulance response</b>	A non-urgent response (code 3 and code 4) by required ambulance or patient transport services that does not necessitate the use of ambulance warning devices (lights and sirens).	
<b>Non-structure fire</b>	A fire outside a building or structure, including fires involving mobile properties (such as vehicles), a rubbish fire, a bushfire, grass fire or explosion.	
<b>Other incident</b>	<p>An incident (other than fire) reported to a fire service that requires a response. This may include:</p> <ul style="list-style-type: none"> <li>• overpressure ruptures (for example, steam or gas), explosions or excess heat (no combustion)</li> <li>• rescues (for example, industrial accidents or vehicle accidents)</li> <li>• hazardous conditions (for example, the escape of hazardous materials)</li> <li>• salvages</li> <li>• storms or extreme weather.</li> </ul>	
<b>Percentiles</b>		
<b>50<sup>th</sup> / 90<sup>th</sup> percentile ambulance service response times</b>	The time within which 50 per cent / 90 per cent of emergency (code 1) incidents are responded to by an ambulance	
<b>50<sup>th</sup> / 90<sup>th</sup> percentile fire service response times</b>	The time within which 50 per cent / 90 per cent of first fire resources respond.	
<b>Response locations (ambulance)</b>	The number of paid, mixed and volunteer response locations per 100 000 people. Locations are primary ambulance response locations where salaried, volunteer or mixed ambulance operatives are responding in an ambulance vehicle and providing pre-hospital care.	
<b>Response time (fire services)</b>	The interval between the receipt of the call at the dispatch centre and the arrival of the vehicle at the scene (that is, when the vehicle is stationary and the handbrake is applied).	
<b>Road crash rescue</b>	An incident involving a motor vehicle and the presumption that assistance is required from emergency services organisations.	

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<b>Staff attrition (ambulance)</b>	The level of attrition in the operational workforce. It is calculated as the number of FTE employees who exit the organisation as a proportion of the number of FTE employees. It is based on staff FTE defined as 'operational positions where paramedic qualifications are either essential or desirable to the role'.
<b>Structure fire</b>	A fire inside a building or structure, whether or not there is damage to the structure.
<b>Structure fire contained to object or room of origin</b>	A fire where direct fire/flame is contained to the room of origin (that is, excludes wildfires and vehicle fire in unconfined spaces). A room is an enclosed space, regardless of its dimensions or configuration. This category includes fires in residential and non-residential structures.
<b>Urgent ambulance response</b>	An urgent (code 2) undelayed response required (arrival desirable within 30 minutes) that does not necessitate the use of ambulance warning devices (lights and sirens).
<b>User cost of capital</b>	The opportunity cost of funds tied up in the capital used to deliver services. Calculated as 8 per cent of the current value of non current physical assets (including land, plant and equipment).
<b>Volunteer (ambulance)</b>	<p><i>Remunerated volunteer ambulance operatives:</i> all personnel who volunteer their availability, however are remunerated in part for provision of an ambulance response (with transport capability).</p> <p><i>Non-remunerated volunteer ambulance operatives:</i> all personnel engaged on an unpaid casual basis who provide services generally on an on-call basis and are principally involved in the delivery of ambulance services. These staff may include categories on the same basis as permanent ambulance operatives (with transport capability).</p> <p><i>Non remunerated volunteer operational and corporate support staff:</i> all personnel engaged on an unpaid casual basis who provide services generally on an on-call basis and are principally involved in the provision of support services. These staff may include categories on the same basis as permanent ambulance operatives.</p>
<b>Volunteer (fire)</b>	<p><i>Volunteer firefighters:</i> staff of the fire service organisation, who deliver or manage a firefighting service directly to the community and who are formally trained and qualified to undertake firefighting duties but do not receive remuneration other than reimbursement of 'out of pocket expenses'.</p> <p><i>Volunteer support staff:</i> all staff that are not remunerated of the fire service organisation, staff shared with other services, and umbrella department's staff. For fire service organisations, any staff that are not remunerated whose immediate client is the firefighter. These can be people in operational support roles provided they do not receive payment for their services other than reimbursement of 'out of pocket expenses'.</p>
<b>Volunteer (S/TES)</b>	Staff/volunteers of S/TES organisations that do not receive payment for their services other than some reimbursement of 'out of pocket expenses'.
<b>Workforce by age group</b>	The age profile of the workforce, measured by the proportion of the operational workforce in 10 year age brackets (under 30, 30–39, 40–49, 50–59 and 60 and over).

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## 9.9 List of attachment tables

Attachment tables are identified in references throughout this chapter by an '9A' suffix (for example, table 9A.3 is table 3). Attachment tables are provided on the Review website ([www.pc.gov.au/gsp](http://www.pc.gov.au/gsp)). Users without access to the website can contact the Secretariat to obtain the attachment tables (see contact details on the inside front cover of the Report).

### Fire events

- Table 9A.1** Major sources of fire service organisations' revenue (2009-10 dollars)
- Table 9A.2** Reported fires and other primary incidents attended to by fire service organisations (no.)
- Table 9A.3** Fire service organisations and land management agencies reported total landscape fires (bush and grass) incidents
- Table 9A.4** Accidental residential structure fires reported to fire service organisations per 100 000 households
- Table 9A.5** Fire service organisations' human resources
- Table 9A.6** Fire deaths
- Table 9A.7** Fire injuries
- Table 9A.8** Median dollar loss per structure fire (2009-10 dollars)
- Table 9A.9** Property loss from structure fire (2009-10 dollars per person)
- Table 9A.10** Fire incidents attended by fire service organisations per 100 000 people
- Table 9A.11** Household preparedness for emergencies, October 2007
- Table 9A.12** Households with a smoke alarm or smoke detector installed
- Table 9A.13** Response times to structure fires, state-wide (minutes)
- Table 9A.14** Structure fires and response times to structure fires, by geographic areas
- Table 9A.15** Structure fires contained to the object or room of origin (per cent)
- Table 9A.16** Fire service organisations' costs (\$'000) (2009-10 dollars)
- Table 9A.17** Fire service organisations' expenditure per person (2009-10 dollars)
- Table 9A.18** Fire service organisations' funding per person (2009-10 dollars)

### Road crash rescue events

- Table 9A.19** Reported road crash rescue incidents (number)
- Table 9A.20** Reported road crash rescue extrications (number)

### SES/TES services

- Table 9A.21** S/TES volunteer human resources (number)

### Ambulance events

- Table 9A.22** Major sources of ambulance service organisations revenue (2009-10 dollars)
- Table 9A.23** Reported ambulance incidents, responses, patients and transport
- Table 9A.24** Ambulance service organisations' human resources
- Table 9A.25** Ambulance service organisations' human resources, operational workforce, by age group and attrition
- Table 9A.26** Ambulance assets (number)

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<b>Table 9A.27</b>	Ambulance stations and locations, by staff type
<b>Table 9A.28</b>	Cardiac Arrest Survived Event Rate
<b>Table 9A.29</b>	Ambulance code 1 response times (minutes)
<b>Table 9A.30</b>	Satisfaction with ambulance service organisations
<b>Table 9A.31</b>	Ambulance service costs (\$'000) (2009-10 dollars)
<b>Table 9A.32</b>	Ambulance service organisations' expenditure per person (2009-10 dollars)
<b>Table 9A.33</b>	Ambulance service organisations' revenue per person (2009-10 dollars)

**Contextual and other information**

<b>Table 9A.34</b>	Communications and dispatching systems
<b>Table 9A.35</b>	Selected fire risk management/mitigation strategies
<b>Table 9A.36</b>	Prevention activities of fire service organisations
<b>Table 9A.37</b>	Delivery and scope of activity of primary fire service organisations
<b>Table 9A.38</b>	All activities of fire service organisations
<b>Table 9A.39</b>	All activities of State Emergency Services and Territory Emergency Services
<b>Table 9A.40</b>	Treatment of assets by emergency management agencies
<b>Table 9A.41</b>	Summary of emergency management organisations by event type
<b>Table 9A.42</b>	Reported fires and other primary incidents, urban and rural inclusions and exclusions
<b>Table 9A.43</b>	Top three known ignition factors for structure fires

## 9.10 References

- ABS (Australian Bureau of Statistics) 2001, *Population Survey Monitor*, Cat. no. 4103.0, Canberra.
- 2008a, *Household preparedness for emergencies*, Cat. no. 4818.0.55.001, Canberra
- 2008b, *Community preparedness for emergencies*, Cat. no. 4818.5, Canberra.
- AIC (Australian Institute of Criminology) 2008, *Bushfire Arson Bulletin No. 51*.
- ATC (Australian Transport Commission) 2000, *National Road Safety Strategy 2001–2010* <http://www.atcouncil.gov.au/documents/pubs/strategy.pdf> (accessed 04 October 2009).
- 2009, *National Road Safety Action Plan 2009 and 2010*, [http://www.atcouncil.gov.au/documents/pubs/ATC\\_actionplan0910.pdf](http://www.atcouncil.gov.au/documents/pubs/ATC_actionplan0910.pdf) (accessed 04 October 2009).
- Australian Government Disaster Assist 2009, *Victorian Bushfires — January/February 2009* <http://www.disasterassist.gov.au> (accessed 22 September 2009).
- Bureau of Infrastructure, Transport and Regional Economics (BITRE) 2009 *Road Crash Costs in Australia 2006*, Canberra

---

EMA (Emergency Management Australia) 2004, *Emergency Management in Australia — concepts and principles*, [www.ema.gov.au](http://www.ema.gov.au) (accessed 04 October 2009).

— 2007, *Natural disaster relief and recovery arrangements*, [www.ema.gov.au](http://www.ema.gov.au) (accessed 04 October 2009).

Ganewatta, G. and Handmer, J. 2007, *The Value of Volunteers in State Emergency Services*, prepared for ACSES and AFAC.

Jacobs I, et al 2004, AHA Scientific Statement, *Cardiac Arrest and Cardiopulmonary Resuscitation Outcome Reports*, Update of the Utstein Templates for Resuscitation Registries, A Statement for Healthcare Professionals from a Task Force of the International Liaison Committee on Resuscitation (American Heart Association, European Resuscitation Council, Australian Resuscitation Council, New Zealand Resuscitation Council, Heart and Stroke Foundation of Canada, Inter American Heart Foundation, Resuscitation Councils of South Africa). *Circulation* November 23, 2004, 110(21): pp. 3385–97. *Circulation* is available at <http://www.circulationaha.org>

SCRCSSP (Steering Committee for the Review of Commonwealth/State Service Provision) 2002, *Report on Government Services 2002*, Productivity Commission, Canberra.

SCRGSP (Steering Committee for the Review of Government Service Provision) 2009, *Overcoming Indigenous Disadvantage: Key Indicators 2009*, Productivity Commission, Canberra

Stirling, C.M., O’Meara P., Pedler, D., Tourle, V., and Walker, J. 2007. *Engaging rural communities in health care through a paramedic expanded scope of practice*. *Rural and Remote Health*. 7: 839. <http://www.rrh.org.au> (accessed 17 December 2007).