



**Centre of Full Employment and Equity**

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**Occupational health effects for firefighters: The extent and implications of physical and psychological injuries and the sources of occupational stress**

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## **Executive summary**

### **Terms of Reference**

The Centre of Full Employment and Equity (CofFEE) was commissioned by the Fire Brigade Employees Union (NSW) to research the impact of firefighting from an occupational health and safety (OH&S) perspective.

The Report has three components:

1. The international literature into the physical and psychological health of firefighters, including:
  - a. the impact of the inherent duties and exposure to hazardous substances and the increased prevalence of illnesses such as coronary and respiratory disease and various types of cancer.
  - b. the impact of stress on psychological health, including the prevalence of posttraumatic stress disorder (PTSD), depression, anxiety, suicide and substance abuse.
2. The effectiveness of mechanisms provided by NSW Fire and Rescue (FRNSW) to address the adverse health effects for firefighters; and
3. Reporting and analysis of the results of the four focus group sessions where firefighters discussed the stress factors, they must deal with in their daily firefighting duties and their role within the wider FRNSW organisational structure. The analysis considers firefighter perceptions of how these stress factors had changed over time.

### **Background**

Firefighters engage in an occupation that is characterised by high-stress, high-risk and low- control of the job-related tasks. FRNSW's most recent Annual Report (FRBSW, 2022) indicates that although the volume of incidents to which FRNSW responds to in a one-year period has not changed significantly over the last ten years, the mix of incident types has changed. In more recent years, demand for FRNSW services have been impacted by risks arising from climate change and needs arising from the state's ageing population as well as increased demand for responses to natural disasters, medical assistance and non-fire rescues and an increased level of support to other agencies.

The distinction between physical and psychological health is not an entirely straightforward one. In addition to the risks to physical health, the dangerous nature of firefighting - suppressing fires and exposure to dangerous substances - also entails considerable anxiety that can produce stress reactions in individuals. Attendance at traumatic incidents can result in psychological distress.

The fundamental problem facing fire service managers is the need to balance the fiscal constraints under which all State public sector institutions operate in Australia, with the need to maintain community protection from fire-related life and property loss, and without compromising the health and safety of frontline career and volunteer firefighters. In times of economic constraint there is a real danger that community and firefighter safety will be compromised by injudicious cuts in fire service capability.

## Physical health impacts of firefighting

The study provides an overview of the literature that examines the impact of inherent duties and exposure to hazardous substances, and the increased prevalence of illnesses such as coronary and respiratory disease and various types of cancer amongst career firefighters.

It analyses the extensive literature on the health impacts of firefighting. It considers the so-called 'healthy worker effect', which makes studying occupational health impacts difficult because firefighters are generally fitter and healthier than other workers at the point of employment due to a rigorous recruitment process. Therefore, findings of adverse health impacts for firefighters are likely to be understated to a greater extent than for the workforce.

Firefighters have one of the most dangerous occupations and have higher than average rates of workplace deaths and injuries. Risks to firefighters arise from hazards associated with fires and non-fire events. Firefighters perform physically demanding work, encompassing multiple fire ground tasks: fire attack, search and rescue, exterior ventilation, and overhaul activities. Firefighters also respond to emergency situations and are frequently first on scene for medical first response (MFR), motor vehicle accidents, and other emergencies such as floods, earthquakes, cyclones, and terrorism. Overexertion and occupational stress have been linked to increased risk of stroke and myocardial infarctions and a leading cause of on-duty fatalities for firefighters is heart attack.

Further, the risks have evolved over time and firefighters are dealing more frequently with wildland fires as these incidents increasingly encroach on urban areas. There have also been substantial changes to the types of hazards that firefighters are exposed to such as exposure to polycyclic aromatic hydrocarbons, asbestos, chemicals in firefighting foams, flame retardants, and the like.

There is substantial evidence that firefighters, who work in hazardous situations and are exposed to very high concentrations of a range of toxic and carcinogenic chemicals. There have been a multitude of studies of cancer risk as well as studies on other physical health risks for firefighters. In July 2022, the World Health Organization declared firefighting "a cancer-causing profession" in its monograph on the identification of carcinogenic hazards to humans (Demers *et al.*, 2022).

Exposure to dangerous substances has clearly resulted in a higher likelihood of firefighters developing a variety of cancers. The management of PPE brings additional risk through the presence of pathogens and other contaminants. Szmytke *et al.* (2022) have examined the risks associated with highly toxic compounds and carcinogenic found that firefighters' protective clothing accumulates harmful substances.

Research also confirms that firefighting presents a significant risk of cardiovascular disease and that there is a need for proven preventative strategies.

Analysing the international statistics also confirms the higher fatality rate of firefighters. In addition to fatalities, a number of adverse health issues are associated with firefighting, including, injuries due to burns and falls; respiratory and cardiovascular disease, strains or sprains, overexertion, and cuts or lacerations.

Gender issues must now be dealt with in terms of health issues as the profession diversifies. Shuster (2000) provided a comprehensive review of the literature covering the experience of women in firefighting and the physical and psychological stresses

they face that are different from male firefighters. Shuster (2000) lists a range of 'stressors ... unique to women in this occupation'. A qualitative investigation into women firefighters' perceptions of health and safety risks, including cancer, found that participants were concerned about general occupational risks including cancer associated with hazardous exposures, sleep disruption and stress, as well as women's health concerns including specific cancers, pregnancy and breastfeeding, and lack of resources (Solle *et al.*, 2021).

The particularly thorny issue of sexual harassment must be treated from the top down. Problems relating to bullying, harassment of any description are best thought of as signifying system-wide cultural issues that requires strong leadership at the management level from the outset.

The link between firefighting duties and cancer has been increasingly legally recognised in several countries via the growth of presumptive legislation. While Canada and the US have led the way in this area, Australia began introducing presumptive legislation in 2012 at the federal level, which has been broadened in scope and intent since. There have also been major legislative advances in the states and territories, including New South Wales on the rights of firefighters 'to make claims for workers compensation entitlements and support, if diagnosed with a specified primary cancer' (NSW State Insurance and Regulatory Authority, 2023). On November 22, 2018, the NSW government passed *The Workers Compensation Legislation Amendment (Firefighters) Bill*, which expanded the policy in relation to 'Presumptions relating to certain cancers' for firefighters (Parliament of NSW, 2018: 3). Other Australian states are also in the process of extending their legislative remit in this area.

### **Psychological impacts of firefighting**

The study examines the research literature that considers the impact of stress on psychological health of career firefighters, including the prevalence of posttraumatic stress disorder (PTSD), depression, anxiety, suicide, and substance abuse. These syndromes arise because firefighters may experience significant trauma and adverse psychological effects from working in dangerous situations as well as attending serious road accidents and responding to medical emergencies. These effects can compound over time. Numerous studies have found that there is a correlation between trauma exposure and post-traumatic stress disorder (PTSD). In the Australian context, Skeffington *et al.* (2017) observed this relationship in Western Australian firefighters.

Firefighter Joshua Darby's extensive study of psychological risk in Fire and Emergency NZ highlighted gaps in organisational responses to psychological risk. Darby refers to the 2018 national survey by Beyond Blue on the mental health and wellbeing of emergency responders in Australia, which noted that compared to the general adult population rates, emergency responders had substantially higher rates of psychological distress, probable PTSD, and suicidal thoughts. Beyond Blue's 2018 national survey found that 'career firefighters had twice the levels of very high psychological distress (8%) and over the twice of the levels of high distress (19%) than that of the Australian adult population (4% and 8%)' (Beyond Blue Ltd, 2018). Furthermore, emergency responders who had served more than 10 years had substantially higher rates of psychological distress, suicidal thoughts, and probable PTSD compared to those with less than two years of service (Beyond Blue Ltd, 2018 quoted in Darby, 2019: 15).

Darby (2019: 22), however, points to the need for a more expansive definition and understanding of psychological risk and speaks of a 'constellation of traumatic distress

symptoms, inclusive of depression and anxiety that while not meeting the criteria for a PTSD diagnosis, will pose a substantial threat to the SHW of firefighters’.

Psychological impacts may be triggered by a single traumatic incident or be cumulative in nature. These should not be considered in isolation from additional stressors that are inherent characteristics of the job such as long periods of inactivity punctuated by periods of high activity, shiftwork, and organisational issues.

There is a high level of comorbidity of psychological illness and substance misuse. This is a serious concern for firefighters since substance abuse – ‘has the potential to impair cognitive and behavioural performance and thus pose workplace productivity problems and safety risks’ (Bacharach *et al.*, 2008: 155-156) and 30 per cent of firefighters were estimated to have alcohol problems, twice the rate of the general population. Studies indicate that with each additional trauma exposure, rates of post-traumatic stress disorder, depression and heavy drinking continuing to rise in a linear manner.

Research into rates of suicide and firefighters point to the high level of psychological risk associated with this group. Martin *et al.* (2017: 177) note that ‘Firefighter and Emergency Medical Services (EMS) personnel experience higher rates of lifetime suicidal ideation and attempts than the general population and other protective service professions’. In the Australian context, Beyond Blue (2018) found that Australian firefighters have three times the rate of suicidal ideation (6.9 per cent) and twice the rate of suicide attempts (0.7 per cent) of the Australian population.

This review understands organisational stressors as defined by Joshua Darby in *Why we 360*, as “separate from the attendance of emergency callouts and critical incidents” (Darby, 2019: 14). Examples of workplace stressors include:

- a worker perceiving that their organisation does not value their contributions and/or wellbeing (Miller *et al.*, 2017).
- work overload, time pressures, the actual or threatened loss of job, bullying, personality conflicts (Lewis, 2014).

Joshua Darby found that Fire and Emergency NZ had identified psychological distress and injury as one of ten critical risks that threaten the safety of firefighters, but his research suggested that the organisation did not provide ‘a sufficient response in relation to this critical risk’ (Darby, 2019: 4). Darby further found that there were gaps between policy and practice in relation to these issues stemming from ‘insufficient governance and resourcing as well as a lack of sufficient connection to the needs of frontline staff (p. 4).

Although there is a much work to be done in relation to improving outcomes for firefighters experiencing psychological distress, there is extensive research on the impact of traumatic incidents – including the cumulative impact of traumatic events and the impact of responding to disasters – has been extensively studied. There has been less of a focus into the psychological impact of the day-to-day routine of working as a firefighter or the impact of other organisational aspects of fire services.

An issue assuming greater importance in an era defined by constrained budgets is the sufficiency of resources available to firefighters. Bacharach *et al.* (2008) explain that perceptions of the adequacy of resources influences the degree to which firefighters can control the work environment. Resource adequacy enables them to cope with the demands of the job and reduce the negative effects of occupational stressors on well-being by ‘reducing the severity and duration of arousal-type distress symptoms’.

Inadequate resources cause individuals to compensate by increasing effort which eventually results in ‘the development of distress symptoms.

There were 20 recommendations arising from Darby (2019: 5) including engagement with a trauma informed care approach that centres core principles of safety, trustworthiness and transparency, peer support, collaboration, empowerment, and humility and responsiveness. The absence of perceived organisational support can be associated with negative outcomes for workers and the organisation. Beyond Blue’s Answering the Call report surveyed 21,014 individuals and found that ‘poor workplace practices and culture were found to be as damaging to mental health as occupational trauma’ (Beyond Blue Pty Ltd, 2018).

Warning signs of psychological problems may come in a variety of forms. Some indicators that there may be a problem with stress that become evident on the job include declining or inconsistent performance; inability to concentrate; indecision; forgetfulness; loss of enthusiasm; increased errors and reduced reaction times (Comcare, 2008). Various forms of workplace conflict may be evident, such as conflict with senior personnel over operational or disciplinary matters or inappropriate management of junior staff (ACPMH, 2013). People may become withdrawn which is expressed in reluctance to give or offer support or absenteeism (Comcare, 2008). Stress may be accompanied by erratic behaviour, sudden mood changes; irritability; angry or aggressive outbursts or crying (Comcare, 2008); family conflict or drug and alcohol abuse (ACPMH, 2013).

Darby points to the value of a trauma-informed an approach as a way of responding authentically to perceived lack of connection. Kusmaul (2020) presents a trauma-informed approach as one that is not intended to diagnose or treat trauma-related conditions. Rather, it is a universal precautions approach that treats all survivors as if they might have adverse effects from traumatic events that are both known and unknown. It operates on the basis that adverse impacts may be affecting survivors and responders in a range of ways.

The trauma informed approach supports a range of approaches that are sensitive to multiple circumstances. A trauma informed approach would not exclude engagement with protective factors have been identified as potentially reducing the likelihood of psychological distress, such as coping strategies and social support, talking to workmates, camaraderie, and black humour. Rather, these strategies can be seen through the lens of a trauma informed approach, operating through feelings of safety and security, social integration, recognition by others, availability of assistance if needed, access to advice and a sense of being needed by others.

A scan of the literature on trauma informed care by Donaldson (2018) found that worker wellbeing is best supported through a combination of both organisational and individual measures. This work highlights the importance of senior leaders in developing and maintaining a culture in the workplace that reflects the values and beliefs needed to support the workforce.

The absence of robust data about organisational stressors in the context of psychological distress amongst firefighters creates challenges in understanding the role it may play in health outcomes.



## Focus group interviews and analysis

Four focus groups conducted with professional firefighters working in FRNSW were conducted on Friday, January 20, 2023, and Tuesday, January 24, 2023. Participants were selected based on their extensive experience and knowledge of fire services in NSW and were recruited by the FBEU. While it is not claimed that the overall participation is based on statistical sampling principles, effort was taken to ensure the groups provided diversity of viewpoints across gender, rank, and location (urban, regional). The transcripts were analysed by the qualitative analysis software NVIVO 12 and sorted into themes.

The focus group participants were asked to indicate which incidents they considered to be stressful and to identify the ten most stressful incidents in terms of the actual firefighting tasks (see Table 6.2). The two most stressful incidents involve the death of a co-worker, followed by a fire incident with multiple fatalities. Then came incidents where a child was seriously injured, or there were multiple burns victims. These results are very similar to those reported in international literature studies and reflect the same risk profiles that firefighting faces in all jurisdictions.

However, most of the respondents indicated that they thought that the sources of stress associated with their jobs had shifted somewhat over time. Interestingly, the major stress factors were related to more recent developments in the Service, including the fact that firefighters are often confronted with medical incidents that they feel unqualified to deal with, rather than the traditional ambit of firefighting.

An overwhelming sentiment expressed by respondents was that the shifts in the management culture and the broadening of responsibilities at the operational level, had accompanied a diminished support structure for the firefighters.

In this vein, while the respondents opined that the usual fire-related situations that they had to confront daily, and the uncertainty of those situations, were stressful, they considered that they had adequate experience and training to deal with those stresses. They accepted that the job was dangerous and created random situations – ‘part and parcel of the job’.

However, many respondents indicated that the predominant new source of workplace stress came from what they considered to be the mismanagement of the service. This problem ranged from a sense that there was a lack of empathy from management towards the operational firefighters, to budget cuts, inadequate training opportunities, and the imposition of tasks that the staff felt ill-equipped to execute effectively (for example, home safety visits).

The introduction of the new health check regime also has created major stress for firefighters, particularly those who are above 50 odd years of age and have been in the service for some years. The common view was that these checks were not aimed to improve the health and well-being of the firefighters, but, rather, were being used, capriciously in some cases, to end careers.

Another new source of stress in the view of the respondents comes with the increasing awareness of the workplace exposure to carcinogenic risks, which many firefighters, particularly those who admitted to having been in the system for some time, worried that they will have diminished life spans.

Further, many respondents stated that there was a culture of ‘bullying and harassment’ within the service.

They also indicated that some of the new protective gear that had been introduced into the Service in recent years, while providing increased protection from chemicals etc, created new issues, such as, a concern for heat stress and they suggested more firefighters are now requiring medical attention after an incident as a result.

Relatedly, a major theme that emerged in the focus groups was the sense that training standards had declined while at the same time the responsibilities being borne by the firefighters had widened into areas not traditionally associated with the fire services.

The focus group participants confirmed that many of the issues from the international literature are also issues in FRNSW. The participants concurred that there were major stresses faced in their daily jobs relating to firefighting, but they generally felt that they had the capability to perform these functions effectively, which helped them manage the trauma they faced.

It was unsurprising to learn that the usual stresses that are common to firefighters around the world also are at play within FRNSW: confronting situations; shift work; the uncertainty of what is ahead when the call to go out is made; and the like.

However, the firefighters also indicated that they incurred major stress when dealing with the MFR situations and distressed family members, which were exacerbated by their lack of adequate training which they felt rendered them unable to perform at optimal levels of efficiency. The perception that they were not properly equipped to deal with this aspect of their job was palpable.

Relatedly, while the traditional stressors were consistently identified, the participants noted that a major new stress was the growing sense of dislocation and distrust of the FRNSW management, who were characterised as careerists obsessed with achieving their own KPIs to advance their own fortunes while neglecting the needs and concerns of the operational firefighters.

This was a very strong resonance throughout the focus groups and indicates a major cultural problem exists within FRNSW.

There were many dimensions outlined in terms of this dislocation: spin versus action; the budget cuts to the service and the efficiency dividend approach imposed by the government had undermined the capacity of the service to perform at high standard; lack of consistency in decision-making by Commanders, lack of support from management; and inadequate funds for training while at the same time being burdened with new responsibilities.

A major new stress identified was the annual health check. The firefighters characterised this as a management strategy to cull older workers from their employment using an arbitrary and at times capricious system of health testing.

The participants also considered the support systems initiated by FRNSW including the peer support program was ineffective and they didn't feel they could trust the confidentiality of the processes. They indicated that informal support at the station-level was the most effective support network but acknowledged that depended on the team personnel and was not consistent across the service.

Ongoing problems with respect to diversity and inclusion were identified by female participants at the focus groups, which indicate that management still has work to do to improve the culture within the Service.

## **1. Terms of Reference and structure of the Report**

The Centre of Full Employment and Equity (CofFEE) was commissioned by the Fire Brigade Employees Union (NSW) to research the impact of firefighting from an occupational health and safety (OH&S) perspective.

The Report has three components:

4. The international literature into the physical and psychological health of firefighters, including:
  - a. the impact of the inherent duties and exposure to hazardous substances and the increased prevalence of illnesses such as coronary and respiratory disease and various types of cancer.
  - b. the impact of stress on psychological health, including the prevalence of posttraumatic stress disorder (PTSD), depression, anxiety, suicide and substance abuse.
5. The effectiveness of mechanisms provided by NSW Fire and Rescue (FRNSW) to address the adverse health effects for firefighters; and
6. Reporting and analysis of the results of the four focus group sessions where firefighters discussed the stress factors, they must deal with in their daily firefighting duties and their role within the wider FRNSW organisational structure. The analysis considers firefighter perceptions of how these stress factors had changed over time.

## 2. Background and context

Firefighters engage in an occupation that is characterised by high-stress, high-risk and low- control of the job-related tasks (Landen and Wang, 2010). Guidotti and Clough (1992: 152) outline the occupational health and safety risks faced by firefighters:

Occupational hazards experienced by firefighters may be categorized for convenience as physical, thermal and ergonomic, chemical, and psychological. The level of exposure experienced by a firefighter in a given fire depends on what is burning, the combustion characteristics of the fire, the structure on fire, the presence of nonfuel chemicals, the measures taken to control the fire, the presence of victims requiring rescue, and the position or line of duty held by the firefighter while fighting the fire.

FRNSW's most recent Annual Report (FRBSW, 2022) provides a breakdown of operational incidents by category. These data indicate that although the volume of incidents to which FRNSW responds to in a one-year period has not changed significantly over the last ten years, the mix of incident types has changed. In more recent years, demand for FRNSW services have been impacted by risks arising from climate change and needs arising from the state's ageing population as well as increased demand for responses to natural disasters, medical assistance and non-fire rescues and an increased level of support to other agencies.

The distinction between physical and psychological health is not an entirely straightforward one. Sources of work-related stress for firefighters include physical, psychological, and psychosocial hazards (Comcare, 2008). In addition to the risks to physical health, the dangerous nature of firefighting - suppressing fires and exposure to dangerous substances - also entails considerable anxiety that can produce stress reactions in individuals. Attendance at traumatic incidents can result in psychological distress. Moreover, psychosocial aspects such as the 'design, organisation and management of work and its social and environmental context that can cause psychological, social or physical harm' (Comcare, 2008: 8). The extension over time of firefighter duties to include not only the traditional role of fire prevention and suppression, but also attendance at motor vehicle accidents, rescue operations, and medical first response (MFR) has exposed firefighters to additional types of stress.

In 2013, the federal government reported on a Senate inquiry into preparedness for extreme weather events in Australia, including an assessment of the preparedness and adequacy or resources for emergency services to respond. The Commonwealth Department of Climate Change and Energy reported that climate change affects fire regimes by changing precipitation patterns, causing higher temperatures and increased CO<sub>2</sub> giving rise to greater vegetation growth (hence fuel). Higher temperatures also dry the fuel load making it more combustible, which is exacerbated by drought conditions. Climate change also increases the probability of extreme fire weather days (high temperature, low humidity, and high winds).

Forecasts published over the past decade report that the Forest Fire Danger Index (FFDI), derived from a measured "drought factor" (based on daily rainfall and period elapsed since the last rain), air temperature, wind speed and relative humidity, is trending toward substantially increased fire risk across Southeastern Australia as the present century unfolds, with inland Northern New South Wales and Victoria anticipated to be worst affected.

Within this environment of expanding workload, uncertainty around future extreme weather events, and increased understanding of emerging exposure risks such as those associated with per- and poly-fluoroalkyls (Rosenfeld *et al.*, 2023) and toxins associated with lithium-ion battery fires (Szmytke *et al.*, 2022) there are pressures on fire services in Australia and elsewhere.

The fundamental problem facing fire service managers throughout the world is that the maintenance of an effective fire emergency response capacity requires commitment of community resources, not just to staff and equip the front-line fire service itself, but for all the activities known to build community capacity to better manage the suppression of fire as a destructive force. Those charged with the responsibility of determining the appropriate level of resources for a fire service at any given time, need to balance the fiscal constraints under which all State public sector institutions operate in Australia, with the need to maintain community protection from fire-related life and property loss, and without compromising the health and safety of frontline career and volunteer firefighters. In times of economic constraint there is a real danger that community and firefighter safety will be compromised by injudicious cuts in fire service capability.

### 3. Fire Services in NSW

#### 3.1 Organisational structure of FRNSW

Fire and Rescue New South Wales is an agency of the New South Wales government, Australia, reporting to the Minister for Emergency Services Australia. The agency is responsible for a range of firefighting and rescue services in cities, towns and regions across the state. The most recent FRNSW Annual Report (FRNSW, 2022) sets out the organisational structure described in Figure 1 below. The units described as ‘Field Operations’ and ‘Strategic Capability’ in Figure 1 employ 96 per cent of the service’s paid staff.

Figure 1 FRNSW Organisational Chart

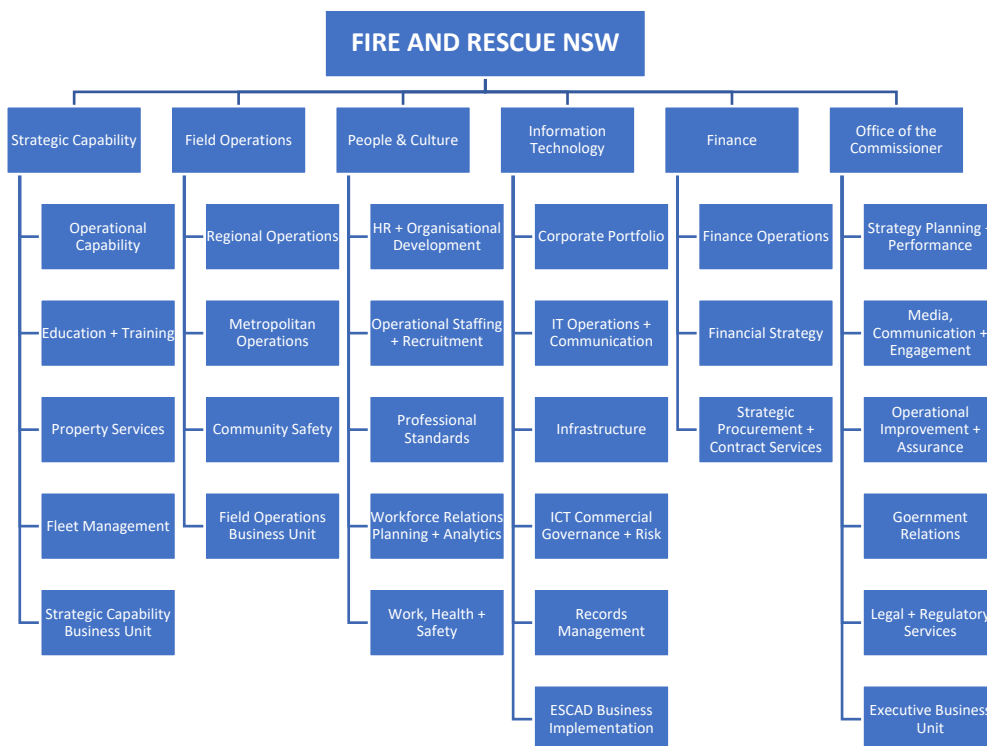


Figure 1: FRNSW Organisational Chart (FRNSW 2022: 14)

#### 3.2 Overview of role of FRNSW

The 2021-22 FRNSW Annual Report notes that there are 3,579 permanent firefighters and 3,243 on-call firefighters. There are, in addition, 515 trades and administrative staff, 26 senior executives and 4,666 community volunteers.

FRNSW has 334 fire stations across NSW and protects 90 per cent of the State’s population from emergencies involving fire, motor vehicle accidents and other dangerous situations. The organisation is responsible for protecting the State of NSW from hazardous materials emergencies and building collapse. It also provides terrorism consequence management. Stakeholders include the people, the environment, and the economy of NSW. A full list of responsibilities includes (FRNSW, 2022):

1. Fire Services
2. Rescue Services
  - a. Animal rescue
  - b. Flood rescue

- c. Road accident rescue
- d. Earthquakes
- e. Train crashes
- f. Building collapse
- g. Complex rescues
- 3. Bushfire services
- 4. Hazardous materials (Hazmat) emergencies
- 5. Community medical assistance
- 6. Urban search and rescue (USAR) capability
- 7. Counter terrorism services
- 8. Fire Investigation and Research Unit (FIRU)

### 3.3 Support programs provided by FRNSW

FRNSW is publicly committed to clear health and safety objectives and to making safety a guiding principle of all operations. In 2017, FRNSW introduced the ‘Plus Plan’, which is a five-year strategy for operational change and will guide the service’s investment in employee capability. At the centre of the ‘Plus Plan’ was the so-called ‘Success Model’, which defines the purpose of the organisation as seen by the management to be ‘Prepared for Anything to Protect the Irreplaceable’ (FRNSW, 2023a). This is a multi-dimension goal that not only considers the outcomes but also ensuring that ‘everyone has the capability to deliver and is accountable’.

FRNSW identified several immediate priorities under the Plan (FRNSW, 2022).

The *Safety and Resilience* theme initiatives include:

- Reducing firefighter exposure to carcinogens – creating defined zones in fire stations, investment in personal protective clothing (PPC), and new systems and technologies to maintain PPC.
- Enhancing firefighter capability – incorporating a development plan, operational improvements, and strategies to improve recruitment, retention, and recognition of on-call firefighters.
- Supporting mental health and wellbeing – linking health check data to health promotion programs, training and embedding 130 volunteer peer support officers, 5 occupational psychologist, four wellbeing officers and a wellbeing coordinator, a psychological triage program, and piloting a Tactical Athlete Resilience Program.

The *Innovation and Research* theme initiatives established in 2021-2022 include:

- Research and collaboration – investigating best practice responses to lithium-ion battery fires and related management, partnering with other state government agencies in relation to safety solutions for new infrastructure and training.
- Technology – establishing the Connected Firefighter program in response to the 2019-2020 Bushfire inquiry to deliver communications information technology and expanding the use of drone capabilities and functions.
- Sustainability – collaborating with state-based agencies and local communities to conduct hazard reduction activities and implementing sustainable products and processes in operations where possible.

The *Community and Partners* theme initiatives delivered:

- Prevention and education – providing resources for children in schools with education about alarms and escape plans.

- Prepared for anything - providing post-disaster clean-up and supporting NSW Ambulance service to provide medical assistance in an emergency.

The *Safety and Resilience* theme captures the key activities designed to address the physical and psychological stressors to which firefighters are exposed.

Peer Support consists of volunteers who are trained to provide psychological first aid in the form of:

- Providing crisis and/or emotional support to employees and family members
- Assisting after critical incidents
- Providing education on stress, coping and support services and
- Assisting firefighters and family members to access professional counselling or health and welfare services.
  - Counselling is available through an internal counselling service or external counselling provided through IPS
  - The Chaplaincy service is provided by the Emergency Services Chaplain.
  - Critical Incident Stress Management service to assist with events that are outside the normal range of experiences and have the potential to cause harm to the people involved.

FRNSW also offers and manages a range of support programs for staff and their families. The *Employee Assistance Program* ‘offers an external service that provides professional and confidential counselling for a broad range of personal problems that may affect the health, safety and work performance of all employees’ (FRNSW, 2023b). The EAP is a 24/7 free external service.

Further, FRNSW offers the *Critical Incident Support Program* who offers trauma support at times of major incidents or over the course of a firefighter’s career.

In addition, FRNSW *Staff Networks* provide support within teams for ‘the purpose of improving the psychological safety, wellbeing and life cycle of every employee’ (FRNSW, 2023b).

Peer support workers are selected and trained to provide peer support to members and family members following critical incidents. The support emphasises assisting individuals to access their own coping mechanisms and social supports.

There are also two Chaplains are employed by FRNSW to offer additional pastoral care to both firefighters and members of the public who have been impacted by major fire-related incidents.

There are several other support services offered including the ‘Community support facility; the Employees Relief and Welfare Fund, and the FRNSW Retirees Peer Support Program.

While these programs are well documented and their purpose is well-defined, the operational firefighters are sceptical of their efficacy – as evidenced by the discussions in the Focus Groups (see Section 6).



## 4. Physical health impacts of firefighting

This section provides an overview of the literature that examines the impact of inherent duties and exposure to hazardous substances, and the increased prevalence of illnesses such as coronary and respiratory disease and various types of cancer amongst career firefighters.

### 4.1 Occupational risks

There is an extensive literature on the health impacts of firefighting. In reviewing studies that compare health outcomes for active firefighters with the general population we need to remain cognisant of the fact that firefighters could be expected to have lower incidence rates due to the healthy worker effect. Table 4.1 provides a summary of a sample of early individual studies of adverse physical health impacts for firefighters. There have been many studies since that have reinforced and/or extended the insights from these earlier research efforts.

Table 4.1 Early studies of adverse physical health impacts for firefighters.

Study	Country	Details	Results/Conclusions
Baris, et al. (2001)	USA	Retrospective cohort mortality study of 7,789 Philadelphia firefighters employed between 1925 and 1986. They calculated standardised mortality ratios and compared the mortality rates for firefighters with white males.	Found that firefighters had increased mortality for colon and kidney cancer, non-Hodgkin's lymphoma and multiple myeloma.
Bates, et al. (2000)	NZ	Calculated standardised incidence ratios (SIRs) and standardised mortality ratios (SMRs) for firefighters in Wellington and compared these with expected numbers based on the entire population, adjusted for age and calendar period.	Overall cancer incidence -as expected. Testicular cancer: SIR = 1.55. For 1990 to 1996: SIR = 2.97 Higher incidence of testicular cancer was unlikely to be due to chance. Mortality rate - below what would be expected.
Bates (2007)	USA	Studied all male cancers in California during 1988-2003 and did logistic regression.	Firefighters: Testicular cancer (OR =1.54); Melanoma (OR=1.50); Brain cancer (OR=1.35); Oesophageal cancer (OR=1.48); Prostate cancer (OR=1.22).
Coggon et al. (2009)	England and Wales	Mortality rates by occupation, 1991-2000	Firefighters had higher mortality rates for cancer of the pleura and non-melanoma skin cancer.
Kang et al. (2008)	USA	Massachusetts firefighters, 1987-2003. Calculated standardised morbidity odds ratio (SMORs) for firefighters, police and all other occupations.	Moderately elevated risk for colon cancer and brain cancer. Weaker evidence for increased risk for bladder cancer; kidney cancer; and Hodgkin's lymphoma.
LeMasters et al. (2006)		Review and meta-analysis of studies on cancer risk for firefighters using the summary risk estimate (SRE)	Probable cancer risk for multiple myeloma, non-Hodgkin's lymphoma, prostate and testicular cancer. Possible risk for eight other cancers.

The healthy worker effect is one of the major problems encountered by researchers studying occupational health impacts. Studies generally compare results from the

occupational group being studied with outcomes for the general population. Healthier individuals remain in employment longer since those who are less fit or develop illnesses are likely to withdraw from the workforce, change their occupational category or retire early. Thus, these comparisons are likely to understate occupational risks since those in the workforce are, on average, healthier than those outside the workforce. In the case of firefighters, the cohort is fitter and healthier than other workers at the point of employment due to a rigorous recruitment process. Therefore, findings of adverse health impacts for firefighters are likely to be understated to a greater extent than for the workforce.

Firefighters have one of the most dangerous occupations and have higher than average rates of workplace deaths and injuries. Risks to firefighters arise from hazards associated with fires and non-fire events. Firefighters perform physically demanding work, encompassing multiple fire ground tasks: fire attack, search and rescue, exterior ventilation, and overhaul activities. Firefighters also respond to emergency situations and are frequently first on scene for medical first response (MFR), motor vehicle accidents, and other emergencies such as floods, earthquakes, cyclones, and terrorism (Clarke and Zak, 1999). Overexertion and occupational stress have been linked to increased risk of stroke and myocardial infarctions and a leading cause of on-duty fatalities for firefighters is heart attack (Varvel *et al.*, 2007). A study of 2,775 firefighter deaths over the period 1990-2012 found that myocardial infarction and cerebrovascular accidents were responsible for an increased proportion of deaths over time, particularly among older firefighters (Kahn *et al.*, 2015).

The World Health Organization Working Group tasked with evaluating occupational exposure for firefighters noted in 2022 that the work carried out by firefighters has changed substantially over time Demers *et al.* (2022: 986). For example, firefighters are dealing more frequently with wildland fires as these incidents increasingly encroach on urban areas. They also note that there have been substantial changes to the types of hazards that firefighters are exposed to.

The Working Group listed:

- combustion products from fires (eg, polycyclic aromatic hydrocarbons [PAHs] and particulates)
- building materials (eg, asbestos)
- chemicals in firefighting foams (eg, perfluorinated and polyfluorinated substances [PFAS])
- flame retardants,
- diesel exhaust, and
- other hazards (eg, night shift work and ultraviolet or other radiation).

Further, these exposures can occur in several ways, including inhalation, dermal absorption and possibly via ingestion (Demers *et al.*, 2022: 985).

Research has previously considered exposure to numerous hazardous materials, such as, asbestos, carbon monoxide, hydrogen cyanide, nitrogen dioxide, sulphur dioxide, hydrogen chloride, aldehydes, benzene, and diesel fumes (Guidotti and Clough, 1992). While in more recent years, research has turned to the management of a group of manufactured chemicals known as PFAS (per- and poly-fluoroalkyl substances) which persist in the environment, and their health impact on firefighters. Although Australian Department of Health guidelines suggest that “PFAS have not been proven to cause any specific ill health in humans” (Australian Government Department of Health 2019: 1)

the Department's guideline acknowledges that large doses of PFAS in laboratory animals may be linked to "effects on the immune system, liver, reproduction, development and benign (non-cancer) tumours" Australian Government Department of Health, 2019: 1).

Research into the impacts of PFAS for exposed professionals and communities is, however, ongoing. Law *et al.* (2023) examined the relative rates of cancer in residents of three Australian communities with environmental contamination arising from the use of firefighting foams that contained PFAS. The study estimated standardised incidence ratios for 23 cancer outcomes and four causes of death, and controlled for sex, age, and date of diagnoses. The research sampled comparison groups from areas without known PFAS contamination and found "limited evidence to support an association between living in a PFAS exposure area and risks of cancers or cause-specific deaths (102,296). In contrast, the World Health Organization background document (March 2022) for the development of guidelines for drinking water quality that has been challenged by scientists for neglecting "the strong links between PFOS and PFOA exposure and the many adverse health outcomes" (Green Science Policy Institute, 2002: 336).

Cancer risks for firefighters will be discussed in more detail in the next section.

## 4.2 Cancer and firefighters

There is substantial evidence that firefighters have elevated rates of several health problems resulting from the work they perform. Firefighters work in hazardous situations and are exposed to very high concentrations of a range of toxic and carcinogenic chemicals: benzene causes leukaemia and lymphoma; asbestos causes lung cancer, malignant mesothelioma and cancer of the larynx; arsenic causes cancer of the skin, lung and liver; vinyl chloride monomer causes angiosarcoma of the liver and brain cancer; formaldehyde causes cancer of the lung and nasal sinuses; 1,3-butadiene causes leukaemia and lymphoma (Landrigan *et al.*, 2005).

There have been a multitude of studies of cancer risk as well as studies on other physical health risks for firefighters. Many studies have involved small numbers and therefore have low statistical power (Guidotti, 2005; Landrigan *et al.*, 2004) or are unable to separate heavily exposed from lightly exposed firefighters (Landrigan *et al.*, 2004). The methodological problems, including comparisons between firefighters and the general population (for example, the healthy worker effect), are likely to underestimate the risks to firefighters and dilute associations (Guidotti, 2005; Landrigan *et al.*, 2004).

In July 2022, the World Health Organization declared firefighting "a cancer-causing profession" in its monograph on the identification of carcinogenic hazards to humans (Demers *et al.*, 2022). Demers *et al.* (2022) note that the WHO Working Group considered that regarding firefighters, there was evidence in humans for mesothelioma, bladder cancer, colon, prostate, and testicular cancers, and for melanoma and non-Hodgkin lymphoma. They also found evidence that 'occupational exposure as a firefighter shows the following key characteristics of carcinogens in exposed human: 'is genotoxic', 'includes epigenetic alterations', 'includes oxidative stress', 'induces chronic inflammation', and 'modulates receptor-mediated effects' (Demers *et al.*, 2022: 985).

Exposure to dangerous substances has clearly resulted in a higher likelihood of firefighters developing a variety of cancers. Guidotti and Clough (1992) explain that the introduction of protective equipment (PPE) has made firefighting safer but has also resulted in a range of other risks, including increases in stress arising from physical

exertion due to the increased weight of clothing and equipment and exposure to radiant heat, which can result in skin changes such as erythema and telangiectasia.

The management of PPE brings additional risk through the presence of pathogens and other contaminants. Szmytke *et al.* (2022) have examined the risks associated with highly toxic compounds and carcinogenic substances that are emitted in electric vehicle and photovoltaic fires in the context of firefighters' clothing and safe handling after these fires. Their study found that firefighters' protective clothing accumulates harmful substances. This is important given the level of exposure when, for example, in a car battery fire, the cobalt level was found to be 24 times higher than that considered safe. The authors note that liquid carbon dioxide can provide a more effective clean than traditional water but indicate further research is required on effective ways to clean these substances from PPE.

### 4.3 Cardiovascular risks

In the US, heart attacks are not only a leading cause of on-duty fatalities for professional firefighters, but there are also many non-fatal heart attacks (Brown and Stickford, 2009). This suggests that 'at the very least, firefighting presents a significant trigger for cardiovascular events' (Brown and Stickford, 2009: 64). A study in Indiana monitored heart and respiration rates and blood pressure of firefighters and found that in the first 90 seconds after the alarm sounds, the heart rate reached around 80 per cent of the predicted heart rate maximum due to both the physical and the emotional response. The report also notes:

The higher the physical demand or emotional stress, the greater the rise in temperature as well as the amount of hormone released. These factors do not simply disappear with the cessation of physical activity or the removal of an emotional stimulus. Substantial time is required to metabolize hormones and to dissipate heat. As a result, stress effects tend to linger.

Brown and Stickford describe one incident that involved the rescue of children entrapped on the second floor of a fully involved residence. The firefighters experienced severe physical and emotional stress and their heart rates were driven to levels more than 100 per cent of their predicted maximum. Two hours after returning to station (some three hours following the completion of rescue operations), heart rates of individuals involved in the rescue remained more than 100 beats per minute. The implications of this study are that the physical and emotional triggers for heart attack stay with the firefighter for some time after an incident and may be a potential trigger for cardiovascular events, especially in individuals with underlying cardiovascular disease (Brown and Stickford, 2009: 70).

Jeung *et al.* (2022) examined the effects of firefighters' emergency duties on the incidence of cardiovascular disease (CVD) in a study of 360,000 employees in a 12-year follow up study in Korea. The authors found that 'the overall age-specific sex-based incidence of CVD, except for hypertension, was higher in firefighters than in public officials'. They concluded the firefighters' duties appeared to lead to an increase in the risk of CVD and that there is a need for proven preventative strategies.

### 4.4 Firefighter fatalities and injuries

A brief consideration of some international statistics demonstrates the higher fatality rate of firefighters. A study of workers compensation records in the United States between 1992 and 1997 revealed that the average workplace fatality rate for firefighters

was 17 per 100,000 employed compared to 5 fatalities per 100,000 employed for all workers, making firefighters more than three times as likely to be fatally injured at work (Clark and Zak, 1999). The most common causes of workplace fatalities during this period were fires and explosions (42 per cent) and transportation incidents (35 per cent). Of those firefighters who lost their life fighting fires two thirds died fighting building or structure fires, while forest or brush fires accounted for around one quarter (Clarke and Zak, 1999).

In the UK, occupational fatalities reported to the Health and Safety Executive (HSE) indicated a rate of 7.4 to 8.5 fatalities per 100,000 firefighters employed. However, the data excludes work-related traffic accidents and heart attacks (Fire Brigades Union, 2008).

Clarke and Zak (1999: 6) emphasise that:

Fatality counts are important in evaluating hazardous jobs because the number of workers killed indicates the magnitude of a safety problem for a group of workers.

In addition to fatalities, a number of adverse health issues are associated with firefighting, including, injuries due to burns and falls; respiratory and cardiovascular disease. In the US, there were 70,090 firefighter injuries in 2011. Of these 43.5 per cent occurred during fireground operations, 21.3 per cent were during attendance at non-fire emergencies, 5.5 per cent were while responding to or returning from an incident, 10.7 per cent were during training activities and 19.0 per cent were during other on-duty activities (Karter and Molis, 2012). Clarke and Zak (1999) reported that the leading nonfatal event between 1992 and 1999 in New York was contact with an object or equipment (19 per cent of non-fatal accidents), while overexertion accounted for 23 per cent of non-fatal events in California over the same period.

Walton *et al.*, (2003) examined workers' compensation data for firefighters in Illinois between 1992 and 1999 and found that the most common injuries were strains or sprains (38 per cent), overexertion (33 per cent), burns (27 per cent) cuts or lacerations (22 per cent) and slips, trips or falls (13 per cent).

A study of 1500 Polish firefighters employed between 1994 and 1997 found that 40 per cent of injuries occurred during compulsory training sessions and 24 per cent happened during emergency operations (Szubert and Sobala, 2002). Szubert and Sobala (2002) did not find any link between injuries and the age of firefighters but found that the duration of time off work increased by 20 per cent with age. In 2011, firefighters in the United States recorded 9,000 exposures to infectious diseases and 23,400 exposures to hazardous materials (Karter and Molis, 2012).

Kahn *et al.* (2015) conducted a review of line of duty firefighter fatalities in the US to establish an understanding of evolving trends over the period 1990-2012. The major causes of death for the period studied were myocardial infarction (40 per cent) followed by mechanical trauma, asphyxiation, and burns. The authors proposed that improved PPE, safety awareness and medical care as well as a younger workforce would be reflected in the trend data. They found that myocardial infarction was responsible for an increased proportion of deaths (from 43 per cent in 1990 to 46.5 per cent in 2012), that deaths from electrocution were reduced but death from trauma was unchanged and that more recent data indicate that line-of-duty mortality was more likely to occur during training. They concluded that "Outreach and education should be targeted

toward vehicle safety, welfare during training, and cardiovascular disease prevention in the firefighter population”.

Elliot and Kuehl (2007: 51) note that ‘long work hours and night shift work increase the rates of occupational accidents’. OAFAC (2011) noting that ‘extended work shifts increase fatigue’ (p.27) cited the empirical literature which has found ‘a correlation exists between the risk of injuries and accidents, the time of day/night and the number of consecutive hours worked’ (p.27).

Their most recent report (Campbell and Evarts, 2021) finds that of the 64,875 firefighter injuries that occurred while on duty, 22,450 were incurred at the fireground.

#### 4.5 The Australian context

There is limited evidence of research in Australia on the physical impacts of firefighting. One major exception was the 2011 Firefighter’s Health Study conducted by Monash University researchers on commission by the Australasian Fire and Emergency Service Authorities Council (AFAC) and the Department of Defence. The Project aimed to:

- investigate differences in the overall death rate and rates for specific causes of death in Australian firefighters compared to the general population; and
- examine differences in overall cancer rates and rates of specific cancer types in firefighters compared to the general population, especially: brain and central nervous system malignancies; melanoma; testicular cancer; prostate cancer; bladder cancer; non-Hodgkin lymphoma; multiple myeloma. For women, the study will also examine outcomes for cervical cancer, thyroid cancer and breast cancer.

The report considered data on cancer prevalence and death rates for firefighters and subgroups which were compared to the general population to inform strategies to protect firefighters. The final report of the study was published in 2014 and made several conclusions:

1. ‘There was no evidence of an increase in cardiovascular or respiratory mortality for firefighters compared to the Australian population or of cardiovascular mortality from internal analyses examining risk by duration of service or number of incidents attended’ (Glass *et al.*, 2014: 11). However, this finding was explained in terms of selection bias (the ‘healthy worker effect’).
2. ‘For male career full-time firefighters compared to the Australian population, overall cancer incidence was significantly raised for the group as a whole and for those who had worked for longer than 20 years’ (p.11). This risk was higher ‘with increasing attendance at vehicle fires’ (p.11).
3. ‘There was a statistically significant increase in prostate cancer incidence for career full-time firefighters overall, and particularly for those employed for more than 20 years’ (p.11).
4. ‘The risk of melanoma was significantly increased for career full-time firefighters, and for both of the employment duration groups who were employed for more than 10 years’ (p.11).
5. ‘Compared to the Australian population, kidney cancer was elevated for those who had been employed for 10-20 years and was significantly higher for those career full-time firefighters who worked more than 20 years compared to those who worked between three months and 10 years, and there was a positive trend with employment duration’ (p.12).

6. 'When compared to the Australian population, male breast cancer was elevated but did not reach statistical significance, it was however, statistically significantly increased among those employed for more than 20 years' (p.12).
7. 'Compared to the Australian population, mesothelioma was statistically significantly increased for those male career full-time firefighters who had been employed for less than 10 years' (p.12).
8. 'Attendance at fires was associated with an increased risk of death from circulatory causes when compared to those who had attended fewest fires but the association was not statistically significant for the highest attendance group' (p.13).
9. 'For male part-time paid firefighters, cancer incidence, specifically prostate cancer and melanoma incidence, were significantly raised compared to the Australian population' (p.13).

Their research was consistent with the international literature surveyed here that provides strong 'evidence that firefighting is associated with an increased risk of some cancers ... Several studies have shown an increased risk of the following cancers: testicular cancer, prostate cancer, non-Hodgkin lymphoma and multiple myeloma' (Glass *et al.*, 2014: 18).

Significantly, the researchers noted that 'there was uncertainty in many of the risk estimates and they should be interpreted cautiously' (p.16). Many of the findings had low statistical power, mostly related to sample size.

The research partnership between Monash and AFAC was reinitiated in 2020 to consider two related research questions exploring: (i) the health impacts of smoke exposure on firefighters and other responders during the 2019/2020 bushfire event in Eastern Australia, and (ii) the health impacts of per-and poly-fluoroalkyl substances (PFAS) on firefighters. Research outcomes from the renewed investigations are not yet available.

As noted above, firefighters are exposure PFAS and have PFAS levels in blood samples that are higher than the general population. There is legitimate concern about PFAS levels due to the emerging evidence about adverse health outcomes associated with elevated blood levels of these substances. Advocacy by firefighter Michael Tisbury has led to research that explores the effect of plasma donation and blood donation in reducing PFAS levels in firefighters in Australia. The research indicated that plasma donation had a more significant effect than blood donation, but both were efficacious (Gasiorowski *et al.*, 2022).

A study of firefighters in the Australian Defence Forces compared the Physiological Strain Index (PSI) and the Adaptive Physiological Strain Index (aPSI) – which incorporates skin temperature in addition to a rating of strain based on body core temperature and heart rate – to consider their use in understanding high levels of exertion and physiological strain as leading causes of fireground injuries. The authors found that absolute peak PSI and aPSI ratings were significantly different and concluded that the aPSI may be a more useful instrument in obtaining a reliable indication of a level of maximal strain (Hunt *et al.*, 2019).

In terms of physical impacts and firefighting, recent research has also considered recent management strategies. A recent study by MacSween *et al.* (2020) aimed to determine if cumulative exposure to mixtures of air toxins would put firefighters at risk in the context of current exposure regulations. This work aimed to supply decision makers with better tools to identify exposure risks. The study did not consider the cumulative

effect of firefighter exposure to multiple toxins emitted during prescribed burns, although the personnel were exposed to a range of hazardous substances known to cause eye disorders, upper and lower respiratory disorders, skin disorders and cancer.

Sharp *et al.* (2023) considered the feasibility of the Tactical Athlete Resilience Program (TARP) as a strength and conditioning intervention for firefighters. The paper suggests that physical fitness in firefighters tends to decline after initial training and that efforts are needed to support firefighters in maintaining the health and fitness standards required to manage the demands of their work. The TARP was delivered in partnership with a professional National Rugby League Club with over 95 per cent of participants reporting that they were very satisfied or somewhat satisfied with the program. The project highlighted the importance of strong partnerships between stakeholders in the design and delivery of interventions.

#### 4.6 Women firefighters

Firefighting has historically been and continues to be a male dominated profession and it is likely that this continues to inform significant elements of the culture. This can be seen in some studies that have reflected on the need to address beliefs about masculinity and appropriate interventions, particularly in relation to issues such as PTSD (Jakubowski and Sitko-Dominik, 2021). There are also gender specific issues to be considered as the profession diversifies.

There is a strong research literature emanating from gender studies that have analysed how women fit into so-called 'archetypal 'masculine' occupations', such as firefighting (Ainsworth *et al.*, 2013).

Giard (2003: 2) notes that in the US, the firefighting service 'is predominantly male, and white' and despite federal legislation aimed at preventing discrimination, '30% of the women in the fire service today are still experiencing discrimination and over 50% experience social isolation within their chosen professions'.

Shuster (2000) provided a comprehensive review of the literature covering the experience of women in firefighting and the physical and psychological stresses they face that are different from male firefighters (see also Chetkovich, 1997; Rosell *et al.*, 1995; Murphy *et al.*, 1994).

Shuster (2000) lists a range of 'stressors ... unique to women in this occupation':

Psychological stressors include: self-doubt, skepticism of their abilities by others, performance pressure, sexual harassment, and social ostracism. Physical stressors include: ineffective physical conditioning, improper training in the use of power tools, and ill-fitting personal protective equipment.

Murphy *et al.* (1994) found that male and female firefighters in their study identified different sources of stress, the latter focusing on concerns about job skills and discrimination, while males, were more stressed by family and financial issues.

There is also evidence that female firefighters feel they are more 'scrutinized' and judged by higher 'standards' (Shuster, 2000: 79). There is nothing in the literature that suggests these unique stressors undermine the capacity of females to be 'effective firefighters' (p.79).

On physical issues, there is evidence from the literature that expectations of women's capacities by other firefighters often exceed what many male firefighters would be able to achieve. For example (Shuster, 2000: 79; see also Chetkovich, 1990):



An argument that is often used against women is that a co-worker should be able to single-handedly pull another firefighter out of a hole, should he fall. Some believe that this is an unreasonable and unrealistic expectation that could not be met by all males.

What we learn from the literature is that a so-called ‘pro-active rather than reactive approach’ (Shuster, 2000: 81) is preferable to head off many of the problems women face in the firefighting service.

The particularly thorny issue of sexual harassment must be treated from the top down. Problems relating to bullying, harassment of any description are best thought of as signifying system-wide cultural issues that requires strong leadership at the management level from the outset.

On 2010, KPMG published a review of FRNSW, which found extensive evidence of poor workplace culture. While the FRNSW introduced initiatives to counter some of the shortcomings identified in the report, they were met with strong resistance from conservative elements in the media and politics (for example, NSW Legislative Council, 2019a, 2019b; Arndt, 2021). Skynews promoted the narrative that women were physically inferior to men and that difference meant that women were a liability in the NSW Fire Service. We consider these issues in the section on focus groups.

A qualitative investigation into women firefighters’ perceptions of health and safety risks, including cancer, found that participants were concerned about general occupational risks including cancer associated with hazardous exposures, sleep disruption and stress, as well as women’s health concerns including specific cancers, pregnancy and breastfeeding, and lack of resources (Solle *et al.*, 2021)

In a US study, one quarter of participants reported that their first pregnancy while in the fire service ended in miscarriage. This increased to one third of pregnancies by the fourth pregnancy. For this population, rates of pre-term delivery were also high (Jahnke *et al.*, 2018).

Jahnke *et al.* (2019: 2314) undertook a study to ‘evaluate the relationship between chronic work discrimination and/or harassment and women firefighters’ (FFs) physical and mental health, substance abuse, and job efficacy, stress, and satisfaction’. Participants reported that in the course of their work, they experienced:

- verbal harassment: 37.5 per cent.
- written harassment 12.9 per cent.
- hazing: 16.9 per cent.
- sexual advances: 37.4 per cent.
- assaults: 5.1 per cent.

These experiences led to negative mental health outcomes including depression and anxiety, and PTSD symptoms. Women who experienced high rates of discrimination and harassment were also more likely to report issues with alcohol consumption. The authors suggested that future research should further explore the ‘relationship between discrimination/harassment and poor health outcomes and potential policies/practices to reduce these’ (p. 2314).

One international study aimed to identify health and well-being issues specific to the experience of women firefighters (Watkins *et al.*, 2019). The study included women firefighters from the United Kingdom, Ireland, North America, Australasia, and mainland Europe. The authors concluded (p. 424):

There is a need for female-specific strength and conditioning support and facilities to decrease injury and illness risk and improve longevity. Research and education into gynaecological issues, heat exposure, and their effects on women firefighters' fertility and cancer risk is required.

#### 4.7 Legal acceptance of occupational health impacts of firefighting

The link between firefighting duties and cancer has been increasingly recognised in law in several countries. This has taken the form of a rebuttable presumption that if a firefighter contracts one of the nominated cancers 'it is considered work-related unless there is compelling evidence to the contrary' (Guidotti, 2007: 466).

The leader in this field of legislation was initially Canada. There has been growing awareness in Canada of the need for so-called presumptive workers' compensation legislation that assumes certain cancers are occupationally caused after varying periods of time working as a firefighter, unless proven otherwise. In 2002, the province of Manitoba was the first to include 'five presumptive cancers for firefighters. It now lists 19 cancers, the same as Nova Scotia and Yukon' (Bains, 2022). The last province to introduce presumptive legislation was Quebec in 2021.

There is some variation in the coverage provided by the legislation within Occupational Health and Safety law across the Canadian provinces and territories, mainly relating to differences in the number of cancers that are included. Over the last several decades, the list of cancers that are now covered by the presumptive law has increased, in part, due to the rising participation of women in the firefighting workforce. This is particularly seen in the case of inclusion of cancers that impact on the reproductive system (Bains, 2022).

The United States then followed, and state presumptive legislation that assumes the cardiovascular diseases, certain cancers and certain infectious diseases are job-related unless proven otherwise is now applicable in most American states. However, the application of the laws varies considerably in relation to cancer according to types of cancers included: the years of service to establish eligibility; the generosity of the workers' compensation; and the provision of death and disability benefits (IAFF, 2022). Further, in some states there is no presumption operative, and the firefighter must prove their illness was work related, which throws the burden of proof back onto the worker. The same applies for federally employed firefighters who are required to nominate a particular incident of exposure that caused the disease. Most states also allow for a rebuttal right where the employer can challenge the presumption. The classic case where rebuttal occurs is a lung cancer arising from a firefighter who also smokes cigarettes.

The WWW site run by the International Association of Fire Fighters - <https://www.iaff.org/presumptive-health/> - provides a comprehensive presumptive disability provisions database, which can be searched and analysed.

In 2012, Australia became the third nation to introduce presumptive legislation (Bains, 2022). Initially, the lead came from the federal government which introduced *The Safety, Rehabilitation and Compensation Amendment (Fair Protection for Firefighters) Act 2011*, amended the relevant 1998 Act by making it easier for firefighters to gain access to the provisions. It was passed in the Australian Parliament and came into effect on July 4, 2011. The Act provides presumptive workers' compensation provisions in relation to firefighters employed in the federal sphere (including volunteers) if they contract certain types of cancers. At the time, The Act covered around 2,800 firefighters

or approximately eight per cent of Australian firefighters (Department of Education, Employment and Workplace Relations, 2011).

On December 7, 2022, further changes to the federal Safety, Rehabilitation and Compensation Act 1988 (SRC Act) became operational, which streamlined access by firefighters to workers' compensation entitlements. This change was required because the 2022 amendments to the Federal Fair Work Legislation Amendment (Secure Jobs, Better Pay) Act 2022, broadened 'the presumptive liability firefighter provisions under the SRC Act to further improve workers' compensation outcomes for firefighters' (Comcare, 2023). Essentially, the provisions that apply to Commonwealth firefighters were extended to ACT and firefighters and reduced the qualifying period for one cancer and broadening the eligibility for relief under the Act.

However, most firefighters are employed at the state level and are covered by state workers' compensation legislation and regulations, which have been slower to embrace the need for presumptive legislation although that situation is changing.

Accordingly, there has been major legislative advances in the states and territories, including New South Wales on the rights of firefighters 'to make claims for workers compensation entitlements and support, if diagnosed with a specified primary cancer' (NSW State Insurance and Regulatory Authority, 2023). On November 22, 2018, the NSW government passed *The Workers Compensation Legislation Amendment (Firefighters) Bill*, which expanded the policy in relation to 'Presumptions relating to certain cancers' for firefighters (Parliament of NSW, 2018: 3). According to the new legislation (Section 19A):

In the application of this Act to a worker who is an eligible firefighter, it is presumed (unless the contrary is established) that the disease contracted by the worker was contracted in the course of the worker's firefighting employment and that employment was:

- (a) for the purposes of the definition of disease injury in section 4, a contributing factor to contracting the disease, and
- (b) for the purposes of section 9A, a substantial contributing factor to contracting the disease.

The Amendment covers '12 specified primary cancers' and the presumption has no time limit.

Other Australian states are also in the process of extending their legislative remit in this area. Late in 2022, we learned that the federal government is planning to extend their legislation to include an additional 8 types of cancers to the current list of 12 cancers recognised within federal presumptive legislation. The challenge ahead is to extend the federal legislative initiatives into the legal framework of the states and territories.

#### 4.8 Conclusion

Research into the physical health impacts of firefighting has been hampered by the dearth of accurate data in relation to the prevalence of some diseases. Moreover, studies that compare outcomes for firefighters with the general population, or even the working population, are likely to understate the health consequences for firefighters due to the healthy worker effect. In the first instance, it is well recognised that workers are generally healthier than the general adult population that includes people who are disabled and those who have left the workforce because they are not fit enough to work.

Secondly, the physically demanding nature of the occupation also means that firefighters must be stronger and healthier than the general workforce when they are recruited. These factors almost certainly mean that the health impacts of firefighting are understated.

The studies mentioned above establish that firefighters are more susceptible to heart and respiratory diseases and a range of cancers and that there is increased awareness of the need for more research into exposure to toxic substances and risks associated with new environmental challenges and technological developments. Although it is difficult to establish causal links between firefighting and physical consequences, including some diseases, the link has been legally recognised through the passing and widening of presumptive legislation in several jurisdictions and more recently by the World Health Organization.

## 5. Psychological impacts of firefighting

### 5.1 Introduction

In this Section we examine the research literature that considers the impact of stress on psychological health of career firefighters, including the prevalence of posttraumatic stress disorder (PTSD), depression, anxiety, suicide, and substance abuse.

### 5.2 Psychological risk

In addition to physical health impacts, firefighters may experience significant trauma and adverse psychological effects from working in dangerous situations as well as attending serious road accidents and responding to medical emergencies. These effects can compound over time. For example, Regehr *et al.* (2003) found a significant linear relationship between years of experience and levels of traumatic stress and depression in firefighters.

Further, this study revealed that experienced firefighters had lower levels of social support and lower self-efficacy than the new recruits. As these variables were associated with traumatic stress and depressive symptoms.

Firefighter Joshua Darby's extensive study of psychological risk in Fire and Emergency NZ made the following key findings (Darby, 2019: 8):

- i) International research indicates that firefighters are experiencing an elevated prevalence of psychological injuries, maladaptive behaviours, and suicide.
- ii) Firefighters are an at-risk group for psychological injury, maladaptive behaviour, and suicide – due, in considerable part, to their high levels of critical incident exposure.
- iii) Firefighters may experience a psychological injury acutely, as the result of a single critical incident exposure, but also, and potentially more commonly, as a result of a culmination and combination of stressors, which includes critical incident stress but also work and home stressors.
- iv) The effects of firefighter psychological distress and injury are likely to be compromising firefighter SHW, familial relations, operational efficacy, and Fire and Emergency organisational culture.
- v) The implementation strategy in relation to a 2014 Memorandum of Understanding (MOU) with emergency ambulance services is likely to have been a contributor to psychological distress and injury within Fire and Emergency.

Darby's study had the aim of assisting 'Fire and Emergency to improve their response to identifying, eliminating, and/or minimising the psychological risks faced by firefighters' (p. 2). Darby used the 360 degree initial 'size-up' activity that officers conduct in their evaluation of an incident and development of an appropriate response strategy. Darby used this model as an analogy for considering the assessment of psychological risks and next steps.

Darby's study analysed the literature on psychological health amongst firefighters and highlighted gaps in organisational responses to psychological risk. Numerous studies have found that there is a correlation between trauma exposure and post-traumatic stress disorder (PTSD). In the Australian context, Skeffington *et al.* (2017) observed this relationship in Western Australian firefighters. Their report stated that it is widely

accepted that firefighters are at high risk for PTE exposure and the post-trauma pathology that can develop because of exposure to traumatic incidents.

### 5.3 Post-traumatic stress disorder, depression and anxiety

The most common adverse psychological impacts include acute stress disorder (ASD), posttraumatic stress disorder (PTSD), major depressive disorders, and substance abuse.

There are two types of stress disorders that may result from traumatic events. In the case of acute stress disorder (ASD) the symptoms occur within one month of the event and last a few days. The second is posttraumatic stress disorder. According to the American Psychiatric Association Diagnostic and Statistical Manual of Mental Disorders (revised fourth edition) all of the following conditions must be satisfied for diagnosis of Posttraumatic Stress Disorder (PTSD) (Antonellis *et al.*, 2006: 85-86):

1. Exposure to a traumatic event in which the individual was confronted with actual or threatened death or serious injury to himself or others and experienced intense fear or helplessness.
2. Reexperiencing of the event triggered by cues associated with the event through thoughts or dreams or by the individual's acting or feeling as if the event were reoccurring. The individual avoids any reminders of the incident, and the person's responses to normal events become numb.
3. The experiencing of "increased arousal", evidenced by the inability to fall or stay asleep, exaggerated startle responses, unusual irritability, or outbursts of anger and heightened vigilance.

These symptoms must endure for at least one month and interfere with important areas of the individual's life such as work or socialisation.

The Australian guidelines for treatment of ASD and PTSD note that PTSD may include non-fear-based symptoms (risky or destructive behaviour, overly negative thoughts and assumptions about oneself or the world, exaggerated blame of self or others for causing the trauma, negative affect, decreased interest in activities, feeling isolated), while ASD does not. Further, they note that PTSD includes a dissociative subtype, whereas in ASD, depersonalisation and derealisation are included as symptoms under the dissociative heading (Phoenix Australia, 2021).

PTSD is perhaps the most widely researched subject in relation to firefighters. Estimates of PTSD vary considerably, both for the general population and for specific cohorts. The best estimates are claimed to be: 2-3 per cent of the UK population; 6.4 per cent of Australian adults; 7-8 per cent of the US population; and 10 per cent across the world (Picking Up the Pieces, undated).

Much higher rates are recorded for specific populations. In the U.S., PTSD rates for firefighters have been estimated to be around 16.5 per cent which is higher than for suburban police officers (13 per cent) but considerably lower than for Vietnam veterans (30 per cent), children who have survived specific disasters (30 to 60 per cent) and female rape victims (60 per cent). Similarly, the 18 per cent estimate for UK firefighters is higher than the general population but lower than specific groups, such as: veterans (30 per cent) and adult rape victims (35 per cent). In Australia veterans experience higher rates of PTSD than the general population: 31 per cent of Gulf War veterans and 56 per cent of Vietnam veterans.

Comorbidity of PTSD with other psychological disorders adds another dimension to the problem. It is claimed that '>50% of individuals with a PTSD at some point will

have a co-morbid major depressive disorder' (McFarlane and Bryant, 2007: 408). Table 5.1 provides some of the measures used in studies of the psychological effects of working as a firefighter or in other emergency services.

Numerous studies have attempted to determine the prevalence of adverse psychological impacts in firefighters, including PTSD, depression, and anxiety in specific cohorts of firefighters. The studies have used a variety of measures and estimates have varied considerably. The prevalence of PTSD has been estimated to range from 6.5 per cent to 37 per cent (Del Ben *et al.*, 2006). Summary information of some of the earlier international studies for firefighters is presented in Table 5.2. The more recent research has reinforced and/or extended the earlier findings.

Haslam and Mallon (2003) conducted a study of 31 fire service staff in the UK. Participants completed an adapted PTSD questionnaire. Participants were asked to identify which traumatic events had concerned them the most and how bothered they were by 17 symptoms that corresponded to the DSM-IV criteria for PTSD (distressing dreams, flashbacks, trouble sleeping, avoiding thoughts and feelings and so on). The two (6.5 per cent) firefighters who were assessed as suffering from PTSD attributed it to events outside work. However, several firefighters stated that they had experienced some of the symptoms associated with PTSD.

Wagner *et al.* (1998) assessed the prevalence of PTSD and comorbid symptoms in 402 professional firefighters in Germany. They used several instruments: GHQ, PTSD Symptom Scale, a stress coping questionnaire, and a self-rating scale to assess bodily complaints. Firefighters were classified as suffering from PTSD if they met the criteria on the PTSD scale and scored above the threshold on the GHQ. One of the problems identified in studies of this nature is that participants may answer the questions in line with social expectations. To reduce this type of bias Wagner *et al.* (1998) excluded those indicating a high degree of social desirability, leaving 318 participants. The study found that 18.2 per cent had PTSD. 27 per cent had a mental disorder according to the GHQ. Of those with PTSD, 39.7 per cent suffered from depressive mood, 60.3 per cent exhibited social dysfunction and 19 per cent engaged in substance abuse. The firefighters also had higher levels of physical complaints than the general population, including cardiovascular conditions, tension, and pain. The best predictors of PTSD were the intensity and duration of exposure, years of service and number of distressing missions in the past month.

Del Ben *et al.* (2006) calculated the PTSD prevalence rate for 131 career and volunteer firefighters in two US states. Several different methods were used to determine "caseness" – whether an individual met the criteria for PTSD. Using the IES, 22 per cent of firefighters met the criterion for PTSD with a cutoff score of 19, while this declined to 17 per cent when the more frequently used cutoff score of 26 was applied. When a cutoff score of 44 was used for the PCL the prevalence rate declined to 8 per cent.

Table 5.1 Measures of psychological outcomes

Measure	Details
General Health Questionnaire (GHQ-12)	Screens for diagnosable mental illness with 4 subscales for: somatic symptoms; anxiety/insomnia; social dysfunction; and severe depression
Acute Stress Disorder Scale (ASDS)	19-item self-report scale for Acute Stress Disorder symptoms
Symptom Checklist 90 (Revised) (SCL-90-R)	Evaluates a broad range of psychological symptoms: 9 different symptom scales that indicate the degree of distress associated with each symptom
NEO-FFI-Revised	60 item, 5 point scale that provides an indication for five domains of personality: openness to experience; agreeableness; conscientiousness, neuroticism; and extroversion
Center for Epidemiological Studies Depression Scale (CES-D)	Measures depressive symptomology including feelings of guilt, worthlessness, helplessness and hopelessness, loss of appetite, sleep disturbance, and psychomotor retardation
Impact of Evert Scale-Revised (IES-R)	Measures posttraumatic stress symptomology. A result greater than 26 should be considered the criterion for PTSD
Disaster-Related Psychological Screening Test (DRPST)	Assesses quality of life, probable PTSD, probable major depression
Posttraumatic Stress Disorder Checklist (PCL) or PTSD Symptom Scale	17 point measure that evaluates the level of PTSD symptoms of intrusion, avoidance, and hyper arousal
CAGE	The CAGE item questionnaire is part of the Health Screening Survey that measures alcohol abuse or dependence
Symptoms of Stress Inventory (SOS)	Measures stress-related symptoms: peripheral/cutaneous; cardiovascular; muscle tension; neurological; depression; anxiety; anger; nervous habit patterns; gastrointestinal distress; and cognitive disorganisation
Zung Self-Rating Depression Scale	Measures levels of depressive symptoms that may be of clinical significance using a 20 item 4 point scale
State-Trait Anxiety Inventory (BDI)	A 20 item 4 point scale that measures individual differences in anxiety proneness
Toronto Alexithymia Scale	Measures the difficulty of recognising and verbalising emotions using a 20 item 5 point scale.
Sources of Occupational Stress instrument (SOOS)	Assesses the types and intensity of job-related stressors
Inventory on Competence and Control Beliefs	Measures self-efficacy using a 32 item 6 point scale
Posttraumatic Diagnostic Scale (PDS)	12-item checklist that allows diagnostic decisions about PTSD and the severity of PTSD. Questions about injury, fear, helplessness and horror about the event; functional impairment during the past month.

Sources: Boxer and Wild, 1993; Chen et al., 2007; Del Ben et al., 2006; Heinrichs et al., 2005; Murphy et al., 1999; Wagner et al., 2010.



Table 5.2 Studies of PTSD and psychological stress for firefighters

Study	Subject	Measures	Results
Chamberlain & Green (2010)	Psychological distress in firefighters in Queensland	GHQ-12.:Trauma - Brief COPE: Coping strategies IES-R: PTSD symptoms-	Trauma: recruits (29%); on-shift (35%); after trauma (31%). PTSD: recruits (14%), on-shift (10%), after trauma (13%)
Corneil et al. (1999)	PTSD in US and Canadian firefighters	IES. Sources of Occupational Stress (SOOS). Social support - WES Social Support Subscale	PTSD prevalence: US 22% (17% moderate and 5% severe). Canada 17% (13% moderate and 4% severe)
Dean et al. (2003)	Psychological distress in firefighters in Queensland	GHQ-28 IES-R	GHQ: Career - 14.7% mild and 17.3% severe distress. Auxiliary - 7.5% mild and 7.5% severe. IES-R: Career -9.3% significant; 13.3% extreme PTSD. Auxiliary - 4.5% significant; 4.5% extreme PTSD.
Del Ben et al. (2006)	PTSD prevalence in US firefighters	PCL IES	PCL – 8% IES (cutoff=19) – 22% IES (cutoff=26) – 17%
Bryant and Harvey (1995, 1996)	PTSD in volunteer firefighters in NSW	GHQ-12 IES	GHQ – 40% some degree of psychological stress IES 37% PTSD symptoms, 24% related to firefighting
Haslam & Mallon (2003)	PTSD in UK firefighters	PDS	6.5% had PTSD
Regehr et al. (2001)	Psychological distress in Victorian firefighters	IES BDI	IES-7% had PTSD and 68% had moderate-level symptoms BDI-3% severe depression; 19.5 % moderate depression
Wagner et al. (1998)	Prevalence of PTSD in German firefighters	GHQ PTSD Symptom Scale Stress coping questionnaire. Self-rating scale to assess bodily complaints.	Prevalence rate of PTSD was 18.2%. 27% had a mental disorder.
Wagner et al. (2010)	PTSD and mental illness symptoms in firefighters and other occupations in British Columbia, Canada.	IES-R SCL-90-R - levels of symptoms NEO-FFI-Revised-five domains of personality	Firefighters: <ul style="list-style-type: none"> <li>▪ self-report greater posttraumatic symptoms</li> <li>▪ Scored higher on self-reported interpersonal sensitivity, anxiety, hostility and psychoticism.</li> </ul>

A study of 144 firefighters from the MFB and CFA in Victoria used a questionnaire covering exposure to traumatic events, social support, the current level of distress and relational capacity, defined as the ability to develop and sustain interpersonal relationships (Regehr *et al.*, 2001). The current level of distress was measured by the BDI that assesses the presence of affective, cognitive, motivational, vegetative, and psychomotor components of depression and the IES to measure PTSD symptomology. IES scores indicated that 7 per cent of firefighters had PTSD and another 68 per cent had scores indicating moderate-level symptoms. The BDI scores indicated that 3 per cent were suffering from severe depression and 19.5 per cent were suffering from moderate levels of depression.

These results would appear to be reasonable when compared with a study of Israeli firefighters who face increased stress due to the experience of terrorist incidents. The study of 342 active firefighters in Israel found that 24 per cent suffered from PTSD and a further 67 per cent displayed partial PTSD, with only 9 per cent showing no sign of PTSD (Fire Engineering, 2012).

Another Australian study assessed 751 volunteer firefighters in NSW to determine the extent to which they experienced PTSD and determine the factors associated with PTSD (Bryant and Harvey, 1995, 1996). The study used the GHQ-12 to assess psychological distress and the IES to assess PTSD. In total, 37 per cent of the firefighters reported posttraumatic stress symptoms using an IES cutoff of 19. When the source of the PTSD was considered, 24 per cent attributed the PTSD to firefighting. Bryant and Harvey used a stepwise multiple regression analysis and found that factors associated with PTSD were fear of trauma, proximity to death, unemployment, severity of threat, loss of loved one and younger age. The proximity to death and severity of threat supports the proposition that PTSD is associated with cumulative effects associated with length and intensity of service.

When disturbance was defined as a score greater than 1 the GHQ-12 indicated that 40 per cent had some degree of psychological distress (Bryant and Harvey, 199 2017: 5). In a subsequent analysis, of the 651 firefighters who attributed their responses to firefighting duties, Bryant and Harvey (1996) found that 14 per cent reported mild distress (score of 2-3 on the GHQ- 12) and a further 13 per cent reported severe distress (score greater than 3 on GHQ-12. When the analysis was restricted to the smaller sample the estimates of PTSD fell from 37 per cent to 26 per cent (Bryant and Harvey, 1996). Of these, 17 per cent experienced significant PTSD related to firefighting and a further 9 per cent suffered reported extreme PTSD. Higher IES scores were associated with feelings of helplessness.

More recently, Milligan-Saville *et al.* (2017) consider PTSD in emergency service personnel who may be forced into early medical retirement because of a combination of physical health issues. This study of 274 Australian firefighters involved completion of a cross-sectional survey using validated, self-report measures of PTSD and somatic symptoms. Analyses examined the association between probable PTSD and a range of common somatic symptoms, and whether any association differed depending on the age of the firefighters.

Firefighters with PTSD reported greater levels of neurological ( $p = .024$ ), gastrointestinal ( $p = .015$ ), and cardiorespiratory ( $p = .027$ ) symptoms compared to those without PTSD. After adjusting for sex, age, and rank, linear regression analysis demonstrated that PTSD was significantly associated with increased total somatic symptom severity ( $p = .024$ ), with PTSD accounting for 9.8 per cent of the variance in

levels of somatic symptoms. There was no interaction between age and the association between PTSD and somatic symptom severity. These results suggest that PTSD is associated with a significant increase in a wide range of somatic symptoms among firefighters, regardless of age. The implications for the identification and treatment of PTSD are discussed.

Joshua Darby refers to the 2018 national survey by Beyond Blue on the mental health and wellbeing of emergency responders in Australia, which noted that compared to the general adult population rates, emergency responders had substantially higher rates of psychological distress, probable PTSD, and suicidal thoughts. Beyond Blue's 2018 national survey found that 'career firefighters had twice the levels of very high psychological distress (8%) and over the twice of the levels of high distress (19%) than that of the Australian adult population (4% and 8%)' (Beyond Blue Ltd, 2018).

Furthermore, emergency responders who had served more than 10 years had substantially higher rates of psychological distress, suicidal thoughts, and probable PTSD compared to those with less than two years of service (Beyond Blue Ltd, 2018 quoted in Darby, 2019: 15).

Darby (2019: 22), however, points to the need for a more expansive definition and understanding of psychological risk and speaks of a 'constellation of traumatic distress symptoms, inclusive of depression and anxiety that while not meeting the criteria for a PTSC diagnosis, will pose a substantial threat to the SHW of firefighters'.

#### 5.4 The impact of major traumatic incidents

Psychological impacts may be triggered by a single traumatic incident or be cumulative in nature. These should not be considered in isolation from additional stressors that are inherent characteristics of the job such as long periods of inactivity punctuated by periods of high activity, shiftwork, and organisational issues. For the purposes of this report, 'critical incidents' and 'traumatic incidents' will be used to refer to incidents that firefighters attend which may lead to the development of psychological distress, and in turn psychological injury. Critical incident distress may also contribute to workplace and home distress.

Nazari *et al.* (2022) recently reappraised the Critical Incident Inventory (CII) to test the construct validity against the Rasch model to evaluate the instrument's utility as a tool for understanding stressful exposures in firefighters and emergency service workers. The CII includes six subscales: trauma to self, victims known to fire-emergency worker, multiple casualties, incidents involving children, unusual or problematic tactical operations, and exposure to severe medical trauma. The revised version of the CII has been found to display a satisfactory level of Rasch model fit.

Some studies have attempted to ascertain which events are the most stressful for firefighters or other emergency staff. A study by of 173 urban professional firefighter/EMTs and firefighter/paramedics in the United States, conducted by Beaton *et al.* (1998), provided a list of 33 actual or potential stressful incidents and asked participants to indicate which incidents were stressful and to rank the stressfulness of incidents. They also collected information on which incidents participants had encountered, and the number of times participants had encountered these in the past six months. The top 20 most stressful incidents are shown in Table 5.3. In the focus groups (see Section 7) we investigated whether this list of stressors was apposite for FRNSW firefighters. We found a substantial overlap was detected. This will be covered in more detail later in this report.

Table 5.3 Most stressful incidents for firefighters

Rank	Incident	Rank	Incident
1	Witness duty related death of co-worker	11	Third degree burn (self)
2	Co-worker firefighter fire fatality (not witnessed)	12	Multiple casualty motor vehicle accident (i-4 deaths)
3	Experience career ending injury (self)	13	Fire incident with multiple burn victims
4	Render aid to seriously injured friend/relative	14	Render aid to seriously injured adolescent
5	Sudden infant death incident	15	Render aid to dangerous psychiatric patient
6	Exposure to hazardous chemicals	16	CPR/full arrest-family present
7	Serious injury to co-worker	17	Render aid to mutilated adult/attempted homicide
8	Render aid to seriously injured child	18	Treat injured patient who resembles self/spouse
9	Fire incident with multiple deaths	19	Attempted domestic homicide victim
10	Multiple casualty motor vehicle accident (more than 5 deaths)	20	Experience head injury (self)

Source: Beaton et al. (1998)

Research in the UK with a small group of firefighters identified the most stressful incidents as: child fatalities, serious accidents, and life-threatening illness in the firefighter's family (Haslam and Mallon, 2003). The results were not significantly different between those who had experienced the incidents and those who had not. Jacobsson *et al.* (2015) described potentially traumatic incidents as follows:

- motor vehicle incidents, structure fires, hazardous substance calls, and natural disasters.
- medical calls, such as paediatric cardiac arrests, drowning, suicides, and overdoses.
- knowing the victim, failed rescue efforts, human error, and mission failure.

Lists of traumatic incidents like those above point to the importance of acknowledging the inherently stressful and challenging nature of the profession on a sustained basis, in addition to the major catastrophic events that attract the attention of community and media. Repeated exposure to traumatic events has been found to produce a cumulative psychological toll leading to effects such as desensitization, flashbacks, and irritability (Jahnke *et al.* 2016).

More recent studies have challenged earlier assumptions about resilience and exposure to traumatic incidents. Harvey *et al.* (2016) found that the risk of PTSD, depression and heavy drinking continued to increase at the same linear rate with each additional trauma exposure. Fire fighters who had experienced more than 20 traumatic incidents involving fatalities had more than four times the rates of PTSD as less exposed fire fighters and substantially increased levels of depression and heavy drinking. Any intervention, such as screening, aimed at high-risk groups must therefore consider the level of cumulative trauma exposure. (Harvey *et al.*, 2016: 656). The authors note that their findings 'have important implications for the ongoing debates surrounding the detection of mental disorders in high-risk occupations and for policy considerations around the welfare of current and retired emergency workers' (p. 649).

The study of the psychological impact of participating in a major traumatic incident has been extensively researched, particularly in the United States. Research findings indicate that major traumatic incidents such as bombings or bushfires are likely to

result in higher levels of psychological stress than normal duties. Table 5.4 list some of the earlier relevant sources of research in this area.

Table 5.4 Studies examining the impact of major traumatic incidents

Study	Subject	Measures	Results
North et al. (2002)	PTSD	181 volunteer firefighters – post Oklahoma bombing	13% had PTSD
Perrin et al. (2007)	PTSD	Rescue and recovery workers World Trade Center	PTSD – 12.4% PTSD Police-6.2% PTSD firefighters-12.2% PTSD volunteers-21.2%
Corrigan et al. (2009)	PTSD	8487 firefighters at the World Trade Centre	76% -at least 1 symptom PTSD – 12%
Riulli and Savicki (2012)	PTSD	50 Firefighters at the World trade Center and 52 not involved	Significantly higher stress levels for the WTC group
McFarlane (1988)	PTSD	469 volunteer firefighters after South Australian bush fires	22% - acute, delayed or chronic PTSD
McFarlane et al. (1994)	PTSD	143 high risk volunteer firefighters from SA study- 42 months after	50 had PTSD and 20 had borderline PTSD

The Oklahoma City bombing in the US in 1995 was a major terrorist event that killed 168 people and injured more than 680 people. A study of 181 volunteer firefighters involved in the response to the tragedy found that approximately 13 per cent suffered from PTSD which was associated with reduced job satisfaction and functional impairment. Drinking to cope indicated poorer functioning (North *et al.*, 2002).

Numerous studies have examined the impact of the September 11, 2001 attack on the World Trade Center on rescue workers. Perrin *et al.* (2007) conducted a study of PTSD prevalence in rescue and recovery workers (3,925 police; 3,232 firefighters and 1,741 emergency medical personnel) involved in the World Trade Center disaster. They conducted assessments 2-3 years after the incident and found the rate of PTSD was 12.4 per cent. The prevalence varied among different groups, ranging from 6.2 per cent for police and 12.2 per cent for firefighters, to 21.2 per cent for unaffiliated volunteers.

A binary-response screening questionnaire was used to investigate the prevalence of PTSD and psychological symptoms in New York firefighters after September 11 (Corrigan *et al.*, 2009). The information collected included: time of arrival at the WTC, self-reported medical symptoms, and mental-health questions from the PTSD Checklist – Civilian Version. Exposure was considered severe if firefighters arrived on the morning of September 11; moderate if they arrived within the first 48 hours and mild if they arrived after this time. The overall PTSD rate of 12 per cent was determined using threshold rates from the DSM-IV-TR. Those who reported the death of a co-worker while working at the WTC site were four times more likely to have elevated PTSD risk.

A study by Riulli and Savicki (2012) compared the psychological and physical outcomes for two groups of firefighters; a group of 50 who were involved at the World

Trade Center and a control group of 52 New York firefighters who were not involved at the Center. The measurement of perceived rescue stress indicated that 'exposure to the concentrated search and rescue activities following the September 11th attacks at the World Trade Center created a substantially more intense set of stressors than did the usual events for firefighters in their regular jobs' (Riulli and Savicki, 2012: 11). The perceived stress accounted for almost all the psychological outcomes and partly accounted for the physical outcomes.

In Australia, firefighters have been exposed to several intense bushfire events. Four months after being involved in the South Australian bushfires in 1983, 469 volunteer firefighters were assessed using the 12-item General Health Questionnaire (GHQ) and the impact of events scale (IES) (McFarlane, 1988). A sample of 50 of the group that was assessed as being at high risk of developing PTSD at four months (those with high exposure, significant psychological symptoms, and intrusive memories of the disaster) was followed up eight months after the fires (McFarlane, 1988). After completing a structured interview, the participants were classified as: 1) chronic or delayed PTSD; 2) acute PTSD; 3) borderline PTSD; 4) imagery present but no PTSD; 5) no PTSD. 11 people (22 per cent) were assessed as having acute, delayed or chronic PTSD.

A further study of 142 firefighters from the original sample, some 42 months after the fires, sought to establish whether there was a relationship between PTSD and physical symptoms (McFarlane *et al.*, 1994). The study involved use of the Diagnostic Interview Schedule (DIS), the IES and GHQ and an interview so that participants could describe their current physical symptoms. 50 participants had PTSD and a further 20 had borderline PTSD. The PTSD group and the same number of non-PTSD participants were compared. There were no statistically significant differences in physical symptoms prior to the fire, and the groups had similar levels of accident and injuries since the fire. However, the PTSD group reported higher levels of physical complaints and were more likely to have consulted a doctor. For example, members of the PTSD group were 4 times as likely to report neurological illness, 3.8 times as likely to report cardiovascular disease and 3.4 times as likely to have respiratory illnesses. The authors conclude that:

This study supports the hypothesis that physical symptoms are common in PTSD sufferers selected from a community sample and suggest that it is not exposure *per se* which led to their presence but rather the development of PTSD (MacFarlane *et al.*, 1994).

Previous research provides a basis for predicting the likely extent of adverse psychological trauma from major catastrophic events such as Black Saturday bushfires. In evidence to the Western Australian Inquiry into the recognition and adequacy of the responses by state government agencies to experience of trauma by workers and volunteers arising from disasters, the Manager of Operational Wellbeing from the CFA stated:

... based on the previous research, in the first 12 months post the disaster something like 25% of exposed people potentially developing symptoms of post-traumatic stress disorder, 26% of exposed people potentially experiencing clinical depression symptoms, and something like 10% experiencing generalised anxiety ... we also anticipated a 40% increase in drug and alcohol use-substance abuse, if you like-and a 50% increase in partner conflict (Community Development and Justice Standing Committee, 2012b: 8).

More recently, following the Grenfell Tower fire in Notting Hill (UK), the London Fire Commissioner was reported as openly acknowledging the traumatic impact on firefighters, including herself. The Guardian UK reported ‘In the immediate aftermath of the fire, which is believed to have killed about 80 people, Dany Cotton expressed concerns about the impact on the mental health of her firefighters, who battled through treacherous conditions in a desperate search for survivors’ (Siddique, 2017). The same article acknowledged the impact of psychological injury on productivity and noted that ‘A recent report by the Chief Fire Officers’ Association found 41,000 shifts a year were lost in England and Wales due to mental health issues suffered by firefighters’ (Siddique, 2017).

The link between traumatic events at a range of scales – including cumulative exposure – and PTSD is well defined internationally. Skeffington *et al.* (2017) look at the Australian context. Their results found that Department of Fire and Emergency Services career members were exposed to trauma at significantly higher rates than the general population and reported elevated rates of post-traumatic stress disorder (PTSD) symptomatology. Elements that contributed to variation in PTSD symptomatology included trauma exposure, social support, and coping style. Maladaptive coping strategies – described as distraction, substance use, venting and self-blame – accounted for more variance in PTSD symptomatology than adaptive coping strategies. The authors concluded that treatment interventions could most effectively target a reduction in maladaptive coping strategies and that a secondary focus on building adaptive coping strategies may be helpful (Skeffington *et al.*, 2017).

The radiating effects of the traumatic experience may also have detrimental impacts on self-awareness, intimacy, sexuality and communication all of which are key elements to the maintenance of healthy interpersonal relationships. McFarlane and Bookless (2001) recommend that investigations into the effect of PTSD on interpersonal relationships should consider that pre-traumatic coping mechanisms may be altered by the traumatic experience, and suggest that the relationship between pre-traumatic, peri-traumatic and post-traumatic attachments should be addressed.

## 5.5 Alcohol and substance abuse

There is a high level of comorbidity of psychological illness and substance misuse. This is a serious concern for firefighters since substance abuse – ‘has the potential to impair cognitive and behavioural performance and thus pose workplace productivity problems and safety risks’ (Bacharach *et al.*, 2008: 155-156) and 30 per cent of firefighters were estimated to have alcohol problems, twice the rate of the general population. Studies indicate that with each additional trauma exposure, rates of post-traumatic stress disorder, depression and heavy drinking continuing to rise in a linear manner. Harvey *et al.* (2016) found that this was also a risk for current and retired emergency workers.

Tomaka *et al.* (2017) examined levels of posttraumatic stress symptoms (PTSS) and relationships between PTSS and alcohol in a group of municipal firefighters in the United States. They found that 32.4 per cent of firefighters reported significant levels of PTSS and this correlated with substance abuse including at-risk drinking and alcohol-related problems. The results of the study suggested that use of alcohol and other substances could be considered maladaptive coping strategies to mediate the effects of PTSS.

Motivating factors for alcohol usage may also include pain-related anxiety. Rogers *et al.* (2020) found that alcohol coping motives in firefighters could be linked to the

experience of pain and pain-related anxiety. The analysis considered pain intensity and its association with coping oriented drinking among firefighters and found that high pain-related anxiety was associated with alcohol use coping motives.

A study by Smith *et al.* (2018) indicates that alcohol use amongst firefighters is also associated with sleep disturbance and sleep disturbance severity was found to be positively associated with alcohol use severity and coping reasons for alcohol use. The same study found that alcohol use severity and alcohol use coping reasons were significant positively associated with posttraumatic stress.

Zegel *et al.* (2022) considered the co-occurrence of PTSD and alcohol use disorder (AUD) and how these diagnoses relate to firefighter mental health. The study found preliminary empirical evidence of the serious impact of PTSD-AUD comorbidity among firefighters with this group scoring higher on seven of eight criterion variables including PTSD, alcohol use, depression, sleep, suicide risk, anger, and occupational risk.

Bacharach *et al.* (2008) surveyed 1481 firefighters from 144 companies in New York in 2003. To estimate the extent of 'drinking to cope' participants were asked how often they drank for various reasons, such as to forget worries; to feel more self-confident; to relieve boredom; and to cheer up when in a bad mood. The analysis of drinking to cope included several independent variables: intensity of involvement with critical incidents; distress; resource adequacy; critical incidents when off-duty; years of service' locus of control; peer support and supervisor support; and involvement at the WTC.

The findings supported the hypothesis that there was a link between the intensity of incidents and drinking to cope and the link was mediated by distress. Further, the results:

suggest that unit members' psychological responses to critical incident involvement may depend on the adequacy of unit-level resources with members of units with less adequate resources being more vulnerable to distress and distress-related sequelae, such as drinking to cope (Bacharach *et al.*, 2008: 165).

Boxer and Wild (1993) examined psychological distress and alcohol use among 145 US firefighters. They calculated three measures of emotional distress that produced similar results, indicating that between 33 per cent and 41 per cent of firefighters were experiencing significant levels of psychological distress. Using the GHQ-12 score they found that 39 per cent had a high level of emotional stress. The CES-D scores indicated that 13 per cent were suffering from mild depression and a further 20 per cent had at least a moderate degree of depression or emotional distress. Finally, the SCL-90-R revealed that 41 per cent had GSI scores above the normal range. The Michigan Alcoholism Screening Test (MAST) found that 29 per cent of those included in the study had possible or probable problems with alcohol use.

To investigate changes over time, Murphy *et al.* (1999) investigated occupational stressors and alcohol use in 188 US firefighters. They used a range of measures at baseline and 2 years later:

- Sources of Occupational Stress Instrument (SOOS).
- Symptoms of Stress Inventory (SOS).
- IES –measured the post trauma symptomology.
- Alcohol consumption and problem drinking – 19 items from the Health Screening Survey (HSS).



The results indicated that PTSD rates decreased from 26.5 per cent to 22.2 per cent but this was not statistically significant. Similarly, the proportion of firefighters reaching the threshold for alcohol abuse decreased from 36.2 per cent to 29.7 per cent but was not statistically significant. Those who self-reported a drinking problem also declined, from 10.3 per cent to 8.1 per cent.

A survey of the literature by Donnelly and Siebert (2009) indicated that emergency response personnel have PTSD rates of more than 20 per cent and the use of alcohol and drug use was as high as 40 per cent. Their survey of 1000 firefighters found that

Most strikingly, 15.5% of fire fighters report having made at least one suicide attempt during their time in the fire service, in contrast to the 1.9-8.7% of US adults estimated to have attempted suicide at some point in their lives (Stanley *et al.*, 2015: 168).

Studies suggest that maladaptive behaviours such as alcohol abuse should be understood as indicators of psychological distress and injury. Paulus evaluated the interactive effects of depression and posttraumatic stress about alcohol use among firefighters.

There was a significant interaction of depression and posttraumatic stress with regard to symptoms of alcohol dependence, positive screen for alcohol dependence, and number of drinks per occasion. Interactions were evident above main effects and covariates (age, presence of a spouse/partner, tenure in the fire department, history of active duty in the U.S. armed forces, and racial/ethnic minority status). Overall, heightened depression was positively associated with alcohol-related outcomes for those with lower but not higher levels of posttraumatic stress in all models. Posttraumatic stress and depression may pose unique interactive risks for alcohol dependence in urban male firefighters (Paulus *et al.*, 2017).

Darby (2019: 29) comments on the radiating effect and impact of psychological distress and injury, noting ‘the children of firefighters who experience psychological injuries and engage in maladaptive behaviours, are more likely to have a higher ACE score and thus have increased vulnerability for a range of negative physiological, psychological, and social outcomes’, thus affecting family, friends, community, and the workplace as well as the individual worker.

## 5.6 Suicide

Research into rates of suicide and firefighters point to the high level of psychological risk associated with this group. Martin *et al.* (2017: 177) note that ‘Firefighter and Emergency Medical Services (EMS) personnel experience higher rates of lifetime suicidal ideation and attempts than the general population and other protective service professions’.

Henderson (2022) reports that suicide is the 10th leading cause of death in the United States and has also become a major concern among career American firefighters with rates for suicidal ideation and attempts in firefighters two to three times higher than rates in the general population and notes the need for research on the empirical evidence of the effectiveness of prevention strategies in this population. In the United States, the National Fallen Fire Fighter Foundation found that ‘a fire department is three times more likely to experience a suicide in any given year than a line-of-duty death’ (National Fallen Firefighters Foundation, 2014: 1).

In the Australian context, Beyond Blue (2018) found that Australian firefighters have three times the rate of suicidal ideation (6.9 per cent) and twice the rate of suicide attempts (0.7 per cent) of the Australian population.

A US study by Martin *et al.* (2016) noted that Firefighter and Emergency Medical Services (EMS) personnel experience higher rates of lifetime suicidal ideation and attempts than the general population and other protective service professions. The authors sought to examine the specific correlates of suicidality (lifetime suicidal ideation and/or attempts) in a firefighter/EMS sample. The results highlighted the importance of targeting depression and severity of PTSD symptoms as a part of any effort to reduce suicidality in this cohort.

Stanley *et al.* (2015: 163) investigated the key factors associated with increased risk for reporting suicidal thoughts and behaviours, and included 'lower firefighter rank, fewer years of firefighter service, membership in an all-volunteer department, a history of professionally responding to a suicide attempt or death, and active-duty military status'. Given the increasing diversity of the workforce it is important that future studies consider the specific risks around segments of the workforce including women and populations outside major metropolitan centres as results may not generalise.

## 5.7 Comparative Studies

In addition to studies of firefighters in one location, there have been studies that have either compared different groups of firefighters or compared firefighters with the general population or matched groups with similar demographic characteristics, but different occupations.

A study by Corneil *et al.* (1999) compared two groups of professional firefighters, one from the US and one from Canada. They investigated the prevalence of PTSD in the two groups using the IES. The sources of occupational stress (SOOS) and the WES Social Support Subscale were used to test for moderating or mediating effects. Corneil *et al.* (1999) found that 22 per cent of US firefighters had PTSD. Of these 17 per cent were assessed as moderate and 5 per cent were found to have severe PTSD. For the Canadian cohort, a total of 17 per cent experienced PTSD, with 13 per cent moderate, and 4 per cent severe sufferers. Their comparison of the results for the firefighters with various North American population groups revealed that the firefighter rates were quite high. Only 1 per cent of the general male population was estimated to have PTSD, rising to 4 per cent for crime victims and between 15 and 20 per cent for Vietnam veterans. Regression analysis results indicated that higher levels of familial and at work social support were found to be associated with lower odds ratios for PTSD, while higher levels of work strain were associated with higher odds ratios for PTSD.

Wagner *et al.* (2010) investigated PTSD and mental illness symptoms in professional firefighters and a control group from the same community in British Columbia, in order to test the hypotheses that firefighters would self-report higher levels of PTSD, higher rates of other mental illness, and that these higher rates would be related to length of service.<sup>4</sup> They used the IES-R to identify those with PTSD and the SCL-90-R to determine the level of symptoms. They also utilised the Five Factor Inventory (NEO-FFI-Revised) scale of five domains of personality: openness to experience; agreeableness; conscientiousness; neuroticism; and extroversion.

The researchers conducted a between-groups one way ANOVA, after controlling for neuroticism, using the IES-R score and found that the firefighters reported significantly more PTSD symptomology. Firefighters were also found to have higher scores for the

SCL-90-R in relation to interpersonal sensitivity, anxiety, hostility, and psychoticism. The analysis of links between personality traits and IES-R revealed that neuroticism was significant predictor of PTSD for firefighters but not for the control group. Neuroticism was significant for SCR-90-R for both groups, while agreeableness (negative) was a predictor for firefighters. The research failed to verify a link between years of service and PTSD and mental illness.

The possibility of differences between firefighters depending on their employment status was explored by Dean *et al.* (2003). The study of 75 career and 67 auxiliary firefighters in Queensland compared the psychological distress levels for the two cohorts. The results from both the GHQ and IES-R indicated higher levels of psychological distress among the career firefighters. Using the GHQ results, 14.7 per cent of career firefighters had mild distress and 17.3 per cent were suffering severe distress. By comparison only 7.5 per cent of auxiliary firefighters had mild distress and a further 7.5 per cent from severe distress. Similarly, career firefighters had higher rates of PTSD compared to auxiliary firefighters for both significant PTSD (9.3 per cent compared to 4.5 per cent) and extreme PTSD (13.3 per cent compared to 4.5 per cent). The level of distress was correlated with years of service and Dean *et al.* (2003) conclude that long-serving firefighters should be monitored for signs of distress.

The impact of trauma on firefighters may also vary significantly according to the stage of their careers and the amount of exposure. Chamberlain and Green (2010) studied psychological distress in 145 professional firefighters in Queensland. They included three distinct groups: 1) 42 recruits; 2) 51 on-shift firefighters; and 3) 52 firefighters who had recently attended a fatal incident. Instruments used in the study were the GHQ-12 to measure trauma, the IES-R to measure PTSD symptoms, and the Brief COPE to measure coping strategies.

There were no significant differences between the groups in relation to trauma or PTSD symptoms. On the trauma scale recruits had the lowest level (29 per cent); followed by the after-trauma group (31 per cent); and the on-shift group had the highest level (35 per cent). PTSD symptomology was highest in the recruit group (14 per cent); followed by the after-trauma group (13 per cent); and the on-shift group had the lowest level of PTSD (10 per cent). Hierarchical regression analysis found that demographic variables – higher age, years of service and rank – were correlated with higher distress but not with PTSD.

## 5.8 Longitudinal studies

Most studies have used retrospective studies to identify the prevalence of PTSD at one point of time. However, there have been some studies that have attempted to measure PTSD at a baseline period and re-measure these symptoms at a future date. This methodology facilitates a comparison of the characteristics of individuals who develop PTSD and those who do not. Several studies have attempted to identify predictors of vulnerability to PTSD.

Heinrichs *et al.* (2005) assessed 43 German firefighters for symptoms of PTSD, depression, and anxiety immediately after basic training (baseline) and then at 6, 9, 12, and 24 months. Personality traits such as self-efficacy and hostility were also identified. At each time period, participants completed questionnaires relating to personality traits, psychological symptoms and demographic characteristics. The measures used to measure psychological symptoms were: 1) the PTSD symptom Scale; 2) General Health Questionnaire; 3) Zung Self-Rating Depression Scale; 4) State-Trait Anxiety Inventory;

5) SCL-90-R; 6) and the Toronto Alexithymia Scale. Self-efficacy was measured by the Inventory on Competence and Control Beliefs.

Researchers used a stepwise multiple linear regression model at 24 months to examine PTSD as a function of pretraumatic symptoms (Heinrichs *et al.*, 2005). After completing basic training none of the firefighters had PTSD. However, 24 months later 16.3 per cent had PTSD and a further 18.6 per cent met the criteria for subsyndromal PTSD according to the PTSD Symptom Scale. The frequency and severity of traumatic events was not correlated with the onset of PTSD. The regression results identified two significant PTSD predicting factors: 1) a high level of hostility according to the SCL-90-R; and 2) a low level of self- efficacy according to the Inventory of on Competence and Control Beliefs.

Australian studies have attempted to examine the impact of trauma by assessing firefighters prior to exposure to traumatic incidents and to measure the cumulative impact of trauma by assessing the same group of firefighters over time (Bryant and Guthrie, 2005; Bryant *et al.*, 2007; Bryant and Guthrie, 2007). They have also attempted to identify predictors of PTSD. These studies involve initial assessments and follow-up assessments of trainee career firefighters in NSW.

Bryant and Guthrie (2005) report on assessments over time of 82 recruits in NSW who were assessed while undergoing training and prior to exposure to trauma. The assessments included:

- Structured clinical Interview for DSM-IV to assess for current Axis I disorders.
- Traumatic Events Questionnaire to assess exposure to prior traumatic events.
- Clinically administered PTSD Scale (CAPS) which indexed PTSD symptoms.
- Beck Depressive Inventory (BDI) which indexed depressive symptoms.
- Posttraumatic Cognitions Inventory (PTCI) that assesses cognitive responses to trauma.

None of the recruits were suffering from PTSD. 68 recruits were then reassessed approximately 6 months after they commenced active duty, and all had been exposed to traumatic events. At this stage none were experiencing PTSD. A further follow-up of 52 of these firefighters 4 years after commencement of active duty found that 12 per cent met the criteria for PTSD (Bryant and Guthrie, 2007). This finding appears to support the proposition that PTSD is associated with cumulative exposure to traumatic incidents. The only criteria that distinguished those with PTSD from those without PTSD was the PTCI self-scores which indicated that those with PTSD had more negative appraisals about themselves (Bryant and Guthrie, 2007). The researchers note that the prevalence of PTSD was low and speculate that this may be due to the firefighters: 1) being an extremely resilient group; or. 2) minimising their symptom reporting 'possibly because of the need to maintain a self- efficacious persona (Bryant and Guthrie, 2007: 815).

Bryant *et al.* (2007) report on the evaluation of 60 NSW Fire Brigades recruits prior to commencing training and follow-up evaluations of 46 of these firefighters for 4 years to test the hypothesis that impaired specific autobiographical memory is a risk factor for developing PTSD. The firefighters were reassessed: 1) within one month of initial trauma exposure after commencing firefighting; 2) 6 months after commencing firefighting duty; and 3) 3 years after commencing firefighting duty. After 4 years all participants had been exposed to numerous traumatic events and 15 per cent had developed PTSD.

In addition to the assessments already outlined in Bryant and Guthrie (2005), at the initial assessment, participants were given 5 positive words (happy, brave, safe, love and special) and 5 negative words (hurt, tense, angry, fear and stress) and asked to report the first specific personal memory triggered by each word. Regression analysis established that history of traumatic events and initial posttraumatic stress did not predict PTSD but pre-trauma deficits in retrieving specific memories to positive cues accounted for 22 per cent of the variation in PTSD. They speculate that a possible explanation for the link with PTSD and deficits in retrieving specific memories may be because retrieving positive memories may be a successful way of responding to a traumatic event.

Zeig-Owens *et al.* (2021) document the challenges in assembling a study that will involve the first survey to collect information on physical and mental health conditions among US firefighters. They particularly note the difficulty of identifying suitable comparator groups in the context of research on the occurrence of health conditions of exposed rescue/recovery workers at the World Trade Centre (WTC) site in New York. A primary goal of the study will be to compare cancer and chronic health conditions in WTC-exposed and non-WTC exposed firefighters.

The need for longitudinal data is apparent, noting the results of a survey conducted by Mind UK (2021), which found that mental health continued to decline across the emergency service since their original scoping research in 2015 and the Mental Health in the Emergency Services survey in 2019, with 25 per cent of respondents rating their mental health as poor or very poor, compared to 14 per cent in 2015 and 21 per cent in 2019.

## 5.9 Organisational stressors

This review understands organisational stressors as defined by Joshua Darby in *Why we 360*, as “separate from the attendance of emergency callouts and critical incidents” (Darby, 2019: 14). Examples of workplace stressors include:

- a worker perceiving that their organisation does not value their contributions and/or wellbeing (Miller *et al.*, 2017).
- work overload, time pressures, the actual or threatened loss of job, bullying, personality conflicts (Lewis, 2014).

Joshua Darby found that Fire and Emergency NZ had identified psychological distress and injury as one of ten critical risks that threaten the safety of firefighters but his research suggested that the organisation did not provide ‘a sufficient response in relation to this critical risk’ (Darby, 2019: 4). Darby further found that there were gaps between policy and practice in relation to these issues stemming from ‘insufficient governance and resourcing as well as a lack of sufficient connection to the needs of frontline staff (p. 4).

Although there is a much work to be done in relation to improving outcomes for firefighters experiencing psychological distress, there is extensive research on the impact of traumatic incidents – including the cumulative impact of traumatic events and the impact of responding to disasters – has been extensively studied. There has been less of a focus into the psychological impact of the day-to-day routine of working as a firefighter or the impact of other organisational aspects of fire services.

The Australian public sector provides a useful template. In the Australian public sector context, psychological distress has been linked to several characteristics of the workplace. Some of the issues that have been identified by Comcare (2008: 9) include:

- Organisational culture and function. Stressors in this area emanate from poor communication, low levels of support for problem-solving and personal development and lack of definition of organisational objectives.
- Decision latitude and control. Low participation in decision-making and lack of control over work increase daily stress.
- Customer-related issues. The need to always act professionally and hide emotional responses, unrealistic expectations of customers and dealing with aggressive customers are particular stressors.
- Home-work interface. Stressors include conflicting demands of home and work and Low levels of support at home.
- Work environment and equipment. Problems regarding reliability, availability, suitability and maintenance or repair of equipment and facilities increase stress levels.
- Workload or work pace. Work overload or underload, lack of control over pacing and high levels of time pressure are daily stressors.
- Work schedule. Stressors in this domain include shiftwork, inflexible work schedules, unpredictable hours, long or unsocial hours.

An issue assuming greater importance in an era defined by constrained budgets is the sufficiency of resources available to firefighters. Bacharach *et al.* (2008: 157) discuss the adequacy of performance resources which they define as:

... the apparatus, tools, support services, information, and infrastructure that are directly brought to bear by job incumbents as they seek to carry out their specified tasks and/or meet task objectives.

Bacharach *et al.* (2008) explain that perceptions of the adequacy of resources influences the degree to which firefighters can control the work environment. Resource adequacy enables them to cope with the demands of the job and reduce the negative effects of occupational stressors on well-being by 'reducing the severity and duration of arousal-type distress symptoms'. Inadequate resources cause individuals to compensate by increasing effort which eventually results in 'the development of distress symptoms.

Some studies have attempted to disentangle the psychological impacts of traumatic and organisational stressors. A study of the relationship between organisational and incident-related stress and psychological distress was conducted by Baker and Williams (2001). They assessed 73 UK firefighters, with approximately half below the rank of station officer. The questionnaires included sections on:

- Social problem-solving. The Cassidy-Long Problem-solving Questionnaire measured: problem solving style; helplessness; problem solving control; problem solving confidence and creativity; avoidance; and approach style;
- Self-reported stress was measured with a questionnaire that included: organisational sources of stress (e.g. pressure from senior colleagues); and incident related stress; and
- Psychological distress was measured using a questionnaire that combined questions relating to psychological distress of working in the fire service and questions from the General Health Questionnaire.

Firefighters (below station officer rank) reported the greatest organisational stressors were lack of consultation and communication and not having enough staff. The relationship between social problem-solving and psychological distress indicated that firefighters reporting higher levels of psychological distress:

Have less effective problem-solving appraisals, they report more helplessness, and less problem-solving control ... less confidence, were less likely to use an approach style, and had higher levels of organizational and incident-related stress (Baker and Williams, 2001: 222).

Regression analysis found that organisational stress, incident-related stress and total problem-solving appraisals accounted for 49 per cent of the variance in psychological distress. However, 'incident-related stress was not a significant independent predictor of psychological distress' (Baker and Williams, 2001: 223).

Research by Brough (2004) attempted to ascertain the impact of both organisational stress and incident-related stress on psychological strain and job satisfaction in 631 police, firefighters, and ambulance service workers in New Zealand:

- Organisational stress was measured using a questionnaire with two sub-scales: Organisational Hassles (excessive paperwork, lack of recognition etc); and Operational Hassles (trying to show interest in people, hoax calls etc);
- Trauma at work was measured by the IES and GHQ-12 measured mental health disorders; and
- Job satisfaction covered intrinsic and extrinsic aspects.

Due to differences between the results for police and the other two services, they estimated a separate model for police. They found that both organisational and incident-related stress predicted psychological strain to a similar extent for firefighters. However, organisational stress predicted job satisfaction to a greater extent than trauma symptomology.

The importance of the recognition of organisational stress in combination with incident-related stress is emphasised:

The implications of this distinction among the sources of occupational stress are manifold. One important implication concerns the channeling of resources to reduce stress exposure and consequences; that is, through support and counseling schemes targeted at traumatic stress or provision of additional staff/resources/reduced workloads to reduce organizational stressors. This distinction also has implications for the content of staff training programs, including the training of "supportive" supervisors (Brough, 2004: 228).

Anecdotal reports such as a recent LA Times article (Wigglesworth, 2022) point to increased stressors arising from resource constraints and workplace challenges for firefighters. The article's title – 'Hellish fires, low pay, trauma: California's Forest Service firefighters face a moral crisis' – encapsulates the issues. The article describes a situation where 'low pay, grueling work and mental stress are driving experienced professional out the door at a time when extreme wildfires are becoming more destructive',

The concept of vicarious trauma may be relevant for this cohort, which considers organizational components such as 'changes in organizational culture, workload, group support, supervision, self-care, education, and work' (Bell *et al.*, 2003).

Armstrong *et al.* (2016) explored the relationship between operational and organisational stress and negative indicators of mental health amongst firefighters and found that organisational stress is typically more strongly related to pathology than operational stress.

There were 20 recommendations arising from Darby (2019: 5) including engagement with a trauma informed care approach that centres core principles of safety, trustworthiness and transparency, peer support, collaboration, empowerment, and humility & responsiveness. The core principles of this first recommendation can be seen as informing all those that follow, but recommendation 5 which concerns a recommended review of ‘management spans of control and administration support resourcing in each Region... and prioritisation of worker wellbeing’ and recommendation 12 that ‘all personal in a position of leadership are made aware of the connection between worker wellbeing and perceived organisational support’. Darby also recommends (no. 16) research that examines ‘perceived organisational support within the Fire and Emergency context’.

Research into the concept of perceived organisational support has found that there were relationships between perceived organizational support, perceived coworker support, and debriefing activities and the levels of compassion satisfaction, burnout, and secondary traumatic stress in Florida law enforcement personnel (Miller *et al.*, 2017).

A meta-analysis conducted by Rhoades and Eisenberger in 2002 indicated that 3 major categories of beneficial treatment received by employees (i.e., fairness, supervisor support, and organisational rewards and favourable job conditions) were associated with perceived organisational support. Perceived organisational support in turn, was related to outcomes that were favourable to employees (for example, job satisfaction, positive mood) and to the organisation (for example, affective commitment, performance, and lessened withdrawal behavior) (Rhoades and Eisenberger, 2002).

The absence of perceived organisational support can be associated with negative outcomes for workers and the organisation. Beyond Blue’s Answering the Call report surveyed 21,014 individuals and found that ‘poor workplace practices and culture were found to be as damaging to mental health as occupational trauma’ (Beyond Blue Pty Ltd, 2018). Organisational responses and workplace culture speak to reputational issues like those measured by New Zealand’s Kantar Public Reputation Index report, which measures organisations on their performance with respect to trust, social responsibility, leadership, and fairness. It is interesting to note that Fire and Emergency NZ have been at the top of the leader board since the report was first run in 2016 (Kantar, 2022).

Armstrong *et al.* (2016) found that in combination, workplace distress and critical incident distress, were predictors in the model that supported research findings that workplace stressors contribute to symptoms of PTSD. Conversely, Beyond Blue (2018) found that workplaces that are sensitive to the emotional demands placed on workers and openly discuss distressing events are perceived as being supportive and this can produce lower rates of PTSD and psychological distress in affected workers. Similarly, Stone *et al.* (2003) found that a feeling of being supported and valued by superiors in the workplace can mediate traumatic distress.

Lentz *et al.* (2021: 639781) considered the concept of moral distress and injury in a range of studies and found that ‘most studies were qualitative and focused on four topics: values, ethical decision-making, organizational betrayal, and spirituality’. They suggested further research is needed to better understand moral distress or moral injury



specific to public safety personnel and to inform training and treatment that will support better mental health outcomes.

Darby points out that the motivation for supporting firefighters should be an ethical one since it is the right thing to do to mitigate suffering (Darby 2018: 25) but productivity and legal factors may also be considered. Research has found that firefighters experiencing psychological distress are ‘more prone to decision-making errors placing colleagues and the community at risk’ (Kaplan *et al.*, 2017, quoted in Darby 2018).

Studies indicate that the right training and resources are essential elements to support workers to manage stress in the workplace. Sattler *et al.* (2014) studied occupational stressors and found that firefighters ranked substandard equipment and job skills as creating more distress than critical incident exposure. This finding is reinforced by Armstrong *et al.* (2014: 43) who noted in their study that ‘it is a widely held tenet of stress literature that an increase in stressors, without concurrent increases in resources, overwhelms an individual’s ability to cope with, and effectively respond to, stressors’.

Darby suggested that the mismatch identified between worker risk and organisational response could be addressed with a review of the organisation’s strategy and framework using a trauma-informed care approach. Darby further pointed to the importance of engaging with firefighters who ‘demonstrate considerable resiliency’ and ‘appear to understand the value of camaraderie in relation to the stressors they encounter’. In the face of what could be described as organisational failure, Darby points to the potential to tap into the capacities of firefighters themselves to address the gaps in organisational response.

## 5.10 Predictors and protective factors

There is growing interest in investigating the factors that predict the onset of PTSD after experiencing a traumatic event as well as factors that may protect individuals. The literature on predictors of adverse mental health outcomes (PTSD, major depression, and drug and alcohol-related disorders) for first responders, including firefighters (Kleim and Westphal, 2011; Wagner *et al.*, 1998), indicates that possible predictors include:

- Younger age, single.
- Prior psychological impairment, including symptoms of depression, psychosomatic complaints, substance abuse and social dysfunction.
- Feeling unsafe, sustaining an injury, proximity to death during a traumatic event.
- Lower feelings of self-worth, holding negative beliefs about oneself (e.g. feeling inadequate or weak).
- Lower levels of social support.
- Work –related factors after traumatic events-work organisation such as shorter nap times, longer job experience and the number of stressful jobs (cumulative stress).
- Holding a supervisory rank.
- Feeling that you lack control over your life.

As mentioned in many studies, not all firefighters exposed to traumatic events will develop PTSD. Just as some characteristics have been found to be associated with the onset of PTSD, there are also a range of protective factors such as personal characteristics social support and effective coping strategies that militate against developing PTSD. Tull (2008) defines protective factors thus:

A protective factor refers to anything that prevents or reduces vulnerability for the development of a disorder.

Social support includes support from family and friends, as well as support from firefighters. Common coping strategies include work-related strategies such as talking to workmates, camaraderie and black humour. Dangermond *et al.* (2022) have considered the role of humour as a coping strategy and a feature of workplace culture amongst firefighters in a Dutch study. The research found that black humour indirectly made it possible to talk about emotions and it tended to have a positive influence on group dynamics, though humour also had the potential to exclude those not “in” on the joke. The absence of humour is suggested to be an indicator that staff may need support (p. 31).

Haslam and Mallon’s (2003) UK study found that most of the firefighters preferred to use partners for support with some indicating they did not want workmates to know how they felt. Conversely, some preferred to talk to workmates because they did not want to burden their partners, or because workmates who had been to the same or similar incidents had a greater understanding of the issues. More individual coping mechanisms include exercise, concentrating on health and nutrition as well as negative coping mechanisms such as alcohol and drug use.

Kleim and Westphal (2011:20) emphasise the importance of research to investigate protective factors to enable effective strategies to be put into place to minimise adverse psychological outcomes:

...there are relatively limited empirical data on factors that may serve protective functions in this population, such as cancelling out the effects of certain risk factors or providing resources that independently lead to positive outcomes. Such information is vital for the development of evidence-based programs targeted at first responders.

This section examines studies that have attempted to establish the factors that predict the onset of PTSD and protective factors that prevent firefighters, exposed to trauma and organisational stressors, from developing PTSD.

Farnsworth and Sewell (2011) investigated the impact of social interaction for 225 US firefighters using a range of measures of social support, negative social interactions and fear of emotion. Regression analysis found that the greatest contributors to PTSD were previous combat duty and calls with a threat to life. The Unsupportive Interactions Inventory (USII) and the Affective Control Scale (ACS) that assesses fear were both found to be statistically significant predictors of PTSD. Wagner *et al.* (1998) studied 402 firefighters in Germany and found that the major predictors of the extent of PTSD were: 1) longer job experience; and 2) the number of distressing events in the past month.

Another US study by Varvel *et al.* (2007) examined the relationship between social support (using the Social Provisions Scale) and stress (using the Perceived Stress Scale) for 53 firefighters. The researchers assessed different types of social support from two sources; supervisors and peers. The types of support were:

- Attachment: feelings of safety and security;
- Social integration: interests and concerns are shared by others;
- Reassurance of worth: skills and abilities are acknowledged and valued by others;

- Reliable alliance: the assurance that tangible assistance is available if needed;
- Guidance: the availability of authoritative others to provide advice; and
- Opportunity for nurturance: the sense of being needed in vital ways by others.

In relation to support from peers, for firefighters with the lowest levels of support, there was a strong negative association between the perceived level of support and stress. This finding suggests that an increase in the level of support for firefighters with low levels of support could be associated with a reduction in stress. The relationship was not significant for firefighters with above median levels of support.

A study of 146 firefighters in Victoria by Regehr *et al.* (2001) modelled the relationship between PTSD and relational capacity (the ability to develop and sustain interpersonal relationships) and perceptions of social support. They found that relational capacity had a negative effect on social support, indicating that perceived social support decreased as disturbances in relational capacity increased. This is an important finding since they also established that perceived social support had a significant negative impact on levels of distress.

Other researchers have utilised data on specific disasters to identify predictors of psychological impacts. Weiss *et al.* (1995) investigated two groups of emergency workers (police, firefighters, paramedics and emergency medical technicians): 1) 154 workers who were involved in the Interstate 880 freeway collapse during the 1989 San Francisco Bay earthquake; and 2) 213 emergency workers from the Bay area and San Diego who did not work at the disaster site. They used hierarchical multiple regression analysis to evaluate exposure, social support and psychological traits and found that levels of distress were related to the level of exposure, lower levels of psychological adjustment and social support. After controlling for exposure, adjustment, social support, and years of experience on the job, the study found that two dissociative variables were strongly predictive of symptomatic stress.

Riulli and Savicki (2012) tested the hypothesis that personality characteristics such as hope, neuroticism and conscientiousness were protective factors using a sample of firefighters involved in the WTC response after September 11 and a control group. They found that there was an inverse relationship between hope and maladjustment in the control group but the reverse was true for the WTC group; the situation overwhelmed the ability of these characteristics to insulate firefighters from the impact of extreme stress. They noted:

The traumatic stress situation seemed to block or even reverse the efficacy of various personality variables in helping firefighters in the traumatic situation deal with stressors. It may be that the extreme range of environmental stressors overwhelmed personal resources that would protect individuals from psychological and physical reactions under conditions of more modest stress. Likewise, specific characteristics of the traumatic condition may degrade specific personal resources (Riulli and Savicki, 2012: 12).

A study of the impact of self-efficacy on professional quality of life for 451 Italian emergency service workers (firefighters, paramedics, and medical technicians) found that the relationship between stress and professional quality of life was significant for workers with low levels of self-efficacy, whereas there was no significant reduction in professional quality of life for workers with higher levels of self-efficacy (Prati *et al.*, 2010). They conclude that self-efficacy acts as a buffer so that traumatic events have

less impact on professional quality of life. The study did not differentiate between the various groups of workers.

Serraon-Ibanez *et al.* (2022) highlight the importance of continued investigations into the protective factors for prevention of PTSD in firefighters. In a survey of the research literature, the author found that there was some evidence that risk factors for PTSD could be operational stress, job duration, burnout, expressive suppression, and rumination. Protective factors may be belongingness and dispositional mindfulness.

Wolffe *et al.* (2023) found that there is also an association between firefighters' exposure to contaminants and mental health. Using logistic regression analysis to analyse outcomes for a population of UK firefighters, the authors found significantly increased odds ratios for anxiety, depression and/or any mental health disorders amongst firefighters who took PPE home to clean. Their research concluded that effective decontamination measures combined with wellness measures may provide a protective role in firefighters' mental health.

General Work Health & Safety models may be utilised by employers and adapted to the specificities of the industry and workplace. Comcare (2008: 4) outlines a risk management approach:

1. Identifying the sources of potential harm to employee health and wellbeing.
2. Systematically assessing the risk of employees being harmed.
3. Developing and implementing a plan to:
  - a) Address the workplace factors that are risks of psychological injury (primary intervention);
  - b) Minimise the impact of stress on employees (secondary intervention);
  - c) Provide safe and effective rehabilitation and return to work for individuals once an injury has occurred (tertiary intervention); and
4. Monitoring and reviewing the implementation and effectiveness of interventions against agreed performance indicators and targets to ensure continuous improvement.

WorkSafe Victoria outlines the causes of work-related stress and appropriate risk management strategies recommended by WorkSafe Victoria and Comcare (2008) are summarised in Table 5.5.

These strategies assist employers to reduce workplace stress. The importance of training as component of risk management strategies was outlined by the CFA in testimony to a parliamentary inquiry in Western Australia:

It is about actually training people to understand what their emotional and psychological responses and reactions are likely to be in the event of a disaster and then actually giving them some basic but effective tools that they can use in the immediate aftermath of exposure to a critical incident. In fact, one of the key things that an individual can do for themselves is to manage their physiological arousal, so manage the adrenaline level to bring it down as quickly as possible. If you do that, you find that your emotional responses become much more regulated much more quickly and you tend to be less likely to be exposed to the kinds of processes then that can result in long-term acute stress or post-traumatic stress disorder (Community Development and Justice Standing Committee, 2012b).

Table 5.5 Causes of work-related stress and risk controls

Causes of work-related stress	Risk controls
Task design (e.g. mismatch between qualifications/experience and the demands of the job)	Provide training, mentoring and performance evaluation, review job responsibilities
Workload/work pace (e.g. work overload, high work rate or time pressures)	Set realistic workloads Ensure adequate resources (including staffing) Provide rest breaks
Work context (e.g. hazardous work, poor communication on workplace issues)	Control workplace hazards Provide communication skills training Provide manager/supervisor support and training
Physical environment (e.g. inadequate equipment)	Ensure equipment is adequate and accessible Ensure ongoing preventive maintenance Provide training on use of equipment
Degree of control (e.g. low participation in decision-making)	Include employees in decision-making in relation to work methods, job design, work pace and rate and amenities Implement processes to allow employees to raise work problems
Organisational function and culture (e.g. poor communication, non-supportive culture where concerns and requests are declined)	Communicate, plan and consult Ensure team meetings are effective and participative Encourage and promote positive work culture Ensure management actively encourages employees to raise workplace concerns Ensure management actively considers and responds to concerns of employees Encourage and promote a positive work culture
Work schedule (e.g. shiftwork, unsociable hours)	Consult and plan in relation to proposed changes in work schedules Ensure adequate notice is provided regarding proposed changes in work schedule
Management of work (e.g. poor leadership, performance management arrangements, inadequate information, training)	Ensure managers and supervisors develop skills and competencies Provide adequate information, instruction and training Recognise and acknowledge skills, competencies and abilities of staff.

Source: Comcare, 2008; WorkSafe Victoria, *Preventing work-related stress-examples of risk control measures*.

Similarly, Malek (2010) studied 617 Malaysian and 436 UK firefighters and concluded that training should focus on psychological aspects such as stress management and coping strategies. Landen and Wang (2010: 159) stress the importance of work cohesion in coping and well-being and suggest the development of preventive strategies aimed at ‘enhancing firefighters’ belongingness and emotional connection with peers and the department.’

In the case of firefighters, there are risks that cannot be eliminated due to the nature of the job. Firefighters are exposed to dangerous conditions and hazardous substances. They are required to attend traumatic events, work under extreme time pressures and are required to operate to their maximum physical capacity in some circumstances. For these reasons firefighters are exposed to greater stresses than other workers even if management undertake the most extensive risk management. Therefore, it is important that employers also have effective strategies in place to provide support to employees working under stressful conditions (see Table 5.5).

Warning signs of psychological problems may come in a variety of forms (Comcare, 2008; ACPMH, 2013). Some indicators that there may be a problem with stress that become evident on the job include declining or inconsistent performance; inability to concentrate; indecision; forgetfulness; loss of enthusiasm; increased errors and reduced reaction times (Comcare, 2008). Various forms of workplace conflict may be evident, such as conflict with senior personnel over operational or disciplinary matters or inappropriate management of junior staff (ACPMH, 2013). People may become withdrawn which is expressed in reluctance to give or offer support or absenteeism (Comcare, 2008). Stress may be accompanied by erratic behaviour, sudden mood changes; irritability; angry or aggressive outbursts or crying (Comcare, 2008); family conflict or drug and alcohol abuse (ACPMH, 2013).

Various types of interventions and supports may be made available for people suffering from or at risk of developing psychological problems because of work-related stress. Critical Incident Stress Debriefing (CISD) involves group sessions with a facilitator who leads participants in discussion of what happened, how they felt during the event and any distress they experienced after the event (Jeanette and Scoboria, 2008). The purpose of debriefings is to prevent the development of permanent psychological injury following a traumatic event by facilitating an understanding of the event and emotional processing of the traumatic experience (Kaplan *et al.*, 2001; Nixon *et al.*, 1999).

Critical Incident Stress Management (CISM) has eight core elements, including CISD. These are: 1) pre-crisis preparation; 2) demobilisation; 3) defusing; 4) critical incident stress debriefing (CISD); 5) individual crisis intervention; 6) pastoral involvement; 7) family or organisational crisis intervention/consultation; and 8) follow-up referral and evaluation of possible psychological assessment and treatment (ACFASP, 2010).

The use of CISD/CISM debriefing has generally been viewed positively by participants. However, studies of debriefings have been inconclusive regarding the benefits or harmful effects of the procedure (Jeanette and Scoboria, 2008; Harris *et al.*, 2002; Boudreaux and McCabe, 2000). Some formal assessments have revealed that there is no clinical benefit in the form of reduced rates of PTSD. A study of firefighters and rescue workers involved in the Oklahoma City bombing indicated that 63 per cent found CISM to be somewhat or very helpful; 23 per cent said it was not helpful and 14 per cent were undecided (Nixon *et al.*, 1999). Those reporting the largest effects from the incidents were more likely to rate CISM as helpful.

The impact of debriefings may vary over time. Kaplan *et al.* (2001:825) refer to a study of outcomes of debriefing of 315 firefighters in Australia after Ash Wednesday that found that although debriefing was associated with a 'lower level of acute posttraumatic stress, it was associated with a higher level of delayed posttraumatic symptoms.'

Other studies point to harmful impacts. Harris *et al.*, (2002: 226) refer to six studies that found:

... debriefed participants (relative to non-debriefed participants) were adversely affected by higher levels of PTSD symptoms, depression, agoraphobic complaints, anger and anxiety.

Similarly, Jeanette and Scoboria (2008: 316) note that:

In the end, there is not a clear body of evidence that can definitively speak to the effectiveness or harm of CISD. However, the working group did conclude

that “some survivors (e.g. those with high arousal) may be put at heightened risk for adverse outcomes as a result of such early interventions.”

Possible explanations for adverse outcomes from debriefings include the possibility that CISD may interfere with the natural recovery processes (Jeanette and Scoboria. 2008) and that later intervention is preferable since defences and coping strategies are stronger (Kaplan *et al.*, 2001).

A study of US firefighters investigated relationships between CISD and various mental health measures, including PTSD, depression, anxiety, world assumptions, and coping strategies and resources (Harris *et al.*, 2002). The study included 660 firefighters who had experienced a stressful incident in the past 6 months; 264 had attended a debriefing and 396 had not. The measures used in the study were: 1) avoidance coping; 2) perceived social support; 3) negative affectivity; 4) world assumptions; and 5) PTSD symptoms. They found that few firefighters had mental health problems. There was a negative relationship between negative affectivity and CISD and a positive relationship between world assumptions and CISD.

Few studies have directly asked firefighters opinions on which supports they would prefer for different situations. A study of 140 urban firefighters in Canada by Jeanette and Scoboria (2008) provided five scenarios: 1) no water for fire; 2) MV accident death; 3) miss adult in primary search; 4) find young children in primary search; and 5) miss young children in primary search. They asked firefighters to rate the desirability of four voluntary supports; 1) no intervention; 2) informal discussion; 3) CISD; and 4) one-to-one debriefing by a peer counsellor. For the first scenario firefighters indicated that no intervention was necessary. There was strong support for informal discussion for all scenarios. CISD and one-to-one were increasingly preferred as the severity of the incident increased. The firefighters rated informal discussion as their preference for scenarios 1 and 2. One-to-one was preferred for scenario 3. For scenario 4 there was no statistical difference between preferences for CISD, one-to-one or informal discussion. For scenario 5 preferences were the same for CISD and one-to-one and these options were preferred to informal discussion. We found no evidence that the intervention was effective in the primary prevention of mental health issues, nor did we find any significant impact of MAPS training on social support or coping strategies. A significant difference across conditions in trauma knowledge is indicative of some impact of the MAPS program (see also Skeffington *et al.*, 2016).

Results indicated that changes in resilience partially mediated the relationship between mindfulness and burnout, and that increased mindfulness was related to increased resilience ( $b = .41$ ,  $SE = .11$ ,  $p < .01$ ), which in turn was related to decreased burnout ( $b = -.25$ ,  $SE = .12$ ,  $p = .03$ ). The bootstrapped confidence interval of the indirect effect did not contain zero [95% CI;  $-.27$ ,  $-.01$ ], providing evidence for mediation (Kaplan *et al.*, 2017).

Meyer *et al.* (2012) found that frequency of trauma exposure did not predict psychological symptoms. Significant predictors of symptoms were perceived social support, occupational stress, coping, as well as the interaction between perceived social support and self-blame. Firefighters who reported low-perceived social support and high self-blame demonstrated the highest levels of clinically significant symptoms. The authors suggested that these findings may inform education, treatment, and resilience training for emergency personnel.

The potential consequences of not effectively mitigating psychological distress are widespread. Sharp *et al.* (2022) found that potential impacts on family experiences included work-stress spill over negatively impacting spousal/partner wellbeing, couple relationships, and domestic violence. Traumatic exposure risk factors also increased the likelihood that families would experience concern for the safety of the affected worker. The study found that protective factors included social support; however, a lack of organisational support for families was reported in some studies.

### 5.11 Supporting worker well being

Joshua Darby's extensive investigation of psychological distress, injury and suicide within Fire and Emergency New Zealand (Darby, 2019) uses the 360 degree initial 'size-up' activity that officers conduct in their evaluation of an incident and development of an appropriate response strategy as an analogy for considering the assessment of psychological distress, related risks, and appropriate next steps. Darby (2019: 67) emphasises the importance of linking policy and practice, and support for frontline. The lack of a connection can be seen as manifesting in two forms:

- 1) 'A lack of sufficient connection to the observations and needs of firefighters and other personnel who are experiencing psychological distress and injury'.
- 2) 'A lack of sufficient connection to a values hierarchies where transcendent values such as integrity and the wellbeing of personnel are prioritized above all else, and that these values manifest not only in words but in tangible action and behaviour'.

Darby points to the value of a trauma-informed an approach as a way of responding authentically to perceived lack of connection.

Kusmaul (2020) presents a trauma-informed approach as one that is not intended to diagnose or treat trauma-related conditions. Rather, it is a universal precautions approach that treats all survivors as if they might have adverse effects from traumatic events that are both known and unknown. It operates on the basis that adverse impacts may be affecting survivors and responders in a range of ways.

The components of trauma-informed care are (Centre for Preparedness and Response, 2022):

- Safety.
- trustworthiness and transparency.
- peer support.
- collaboration and mutuality.
- empowerment, voice, and choice.
- cultural, historical, and gender issues.

The trauma informed approach supports a range of approaches that are sensitive to multiple circumstances. A trauma informed approach would not exclude engagement with protective factors have been identified as potentially reducing the likelihood of psychological distress, such as coping strategies and social support, talking to workmates, camaraderie, and black humour. Rather, these strategies can be seen through the lens of a trauma informed approach, operating through feelings of safety and security, social integration, recognition by others, availability of assistance if needed, access to advice and a sense of being needed by others.

A scan of the literature on trauma informed care by Donaldson (2018) found that worker wellbeing is best supported through a combination of both organisational and individual measures. For example, McGilton *et al.* (2007) found that supervisory support for



nursing administrators was an important determinant of job satisfaction and that increased supervisory support was associated with reduced levels of job stress. Research indicated that organisation strategies that protect workers have more impact than reactive measures to staff burnout. The evidence pointed to several protective factors from secondary traumatic stress and vicarious trauma such as:

- Organisation culture.
- Supervisors and managers who are themselves trauma-informed.
- An individually determined self-care regime.

This work highlights the importance of senior leaders in developing and maintaining a culture in the workplace that reflects the values and beliefs needed to support the workforce.

There is mixed evidence for the success of strategies to mitigate the effects of posttraumatic stress injuries (PTSIs). Anderson et al conducted a systematic review of the interventions designed to mitigate PTSIs among public safety and frontline healthcare personnel. Eligible studies investigated “the effectiveness of organizational peer support and crisis-focused psychological interventions” that aimed to mitigate PTSIs. There were 14 eligible studies but these did not include pre-and post-evaluations and had inconsistent outcome measures, pointing to the need for further well-designed study into this area (Anderson *et al.*, 2020).

The absence of robust data about organisational stressors in the context of psychological distress amongst firefighters creates challenges in understanding the role it may play in health outcomes. Positive working environments have been found to have significant impacts on many domains of firefighter life, leading Pasca and Wagner (2022: 516) to conclude that ‘a positive working environment should be considered a key area of intervention in assisting toward overall well-being for firefighters’.

## 6. Focus group interviews and analysis

### 6.1 Overview

An important part of the research deployed four focus groups conducted with professional firefighters working in FRNSW. The focus groups were conducted on Friday, January 20, 2023, and Tuesday, January 24, 2023, with 2 groups participating on each of those days. The sessions ran for approximately 1 hour and each group had 5 or 6 participants, who were selected based on their extensive experience and knowledge of fire services in NSW and were recruited by the FBEU. The consultant provided the FBEU with guidelines as to demographic and rank characteristics that should be represented in the groups, to help them ensure there was diversity across rank, gender, and other characteristics consistent with the profile of staffing in FRNSW. While it is not claimed that the overall participation is based on statistical sampling principles, effort was taken to ensure the groups provided diversity of viewpoints across gender, rank, and location (urban, regional).

Each participant was provided with an information document prior to their attendance, which emphasised that the sessions were being conducted in accordance with Australian Privacy Principles. Further, while voluntary consent to participate had been provided, participants could opt for anonymity and pseudonymity if they choose and withdraw from the sessions at any time without consequence. Participants were advised that they could also request that their input be expunged from the dataset and not used in any way. The consultant was not apprised of any information that could identify the participants and the FBEU was not provided with any raw data that was produced from the Focus Group transcripts. All participants agreed to voluntary participation.

Each participant was also asked to complete basic demographic and employment details. They were also asked to consider specific types of incidents and indicate whether they thought those incidents were stressful and to rank the ten most stressful incidents.

To structure the Focus Group process, the participants were provided with five questions, which served as opening discussion topics and were in line with the objectives of the research specified by the FBEU:

1. What have been the major changes in the fire services in recent decades?
2. How does the role of firefighters differ from that of other emergency services personnel?
3. What are the major stressors for firefighters?
4. The psychological impact of stress for FRNSW firefighters.
5. What supports are available for firefighters to deal with job-related stress and how well do they work?

The four focus group sessions produced 206 A4 pages of transcripts, which were then input and analysed by the qualitative analysis software NVIVO 12. The software allowed us to organise the raw data into themes and achieve a better visualisation of the main messages. While the focus group sessions were organised along the lines of the five itemised structural issues outlined above, in this section we report the findings under more intuitive headings reflecting the main themes that emerged in the focus groups. Throughout, the indented and italicised quotes were taken directly from the transcripts of the actual sessions. There are also partial quotes within the text that are indicated by single parentheses.

## 6.2 Demographic characteristics of the participants

In total there were 20 participants who were all permanent firefighters. The demographic details are summarised in Table 6.1. The participants reflected a diversity of age, educational background, duration of service and rank. The gender balance was close to that currently in the Service. The rank proportions were closely aligned with the actual proportions found in the Service.

The fact that the vast majority participants were required to have extensive experience and knowledge of fire services, resulted in a cohort who were above the average age and had above average years of service.

Most participants were over 40 years of age; 30 per cent were in the 40-54 age group and a further 45 per cent were aged 55 years or over. The majority were married or partnered (75 per cent) and either had a Year 12 education (25 per cent), certificate (40 per cent), or a diploma (40 per cent). In terms of experience, 65 per cent had more than 20 years of service.

Table 6.1 Demographic characteristics of focus group participants

<b>Characteristic</b>	<b>Categories</b>	<b>Percent of Total</b>
Rank	Senior management	5.0
	Station officer	20.0
	Fire officer	75.0
Gender	Male	90.0
	Female	10.0
	Non-gender specific	0.0
Age group	Under 25	0.0
	25-39	25.0
	40-54	30.0
	Over 55	45.0
Marital status	Married/partnered	75.0
	Not married/partnered	25.0
Highest level of Education	Year 12	25.0
	Certificate	40.0
	Diploma	25.0
	Undergraduate degree	5.0
	Post-graduate	5.0
Length of employment	Less than 5 years	5.0
	Between 5 and 10 years	5.0
	Between 10 and 20 years	25.0
	Over 20 years	65.0

### 6.3 Prior focus group research in the Victorian fire service

In January 2013, the Centre of Full Employment and Equity completed a similar task for the United Firefighters Union (UFU) in Victoria where 3 focus groups were ran along similar lines to the current research (see Cook and Mitchell, 2013). At the time, the Victorian service was split between the Metropolitan Fire Brigade (MFB) and the Country Fire Authority (CFA).

By way of summary of their findings, the focus group participants from the MFB identified the introduction of medical first response (MFR) into the responsibilities that firefighters assumed to be the biggest change that they had to deal with in the two decades leading up to the interviews.

The other major change the MFB participants identified was the ‘the suspension of recruit courses for a period of around 10 years after the Kennett Government came to power’, which had forced firefighters to ‘work more overtime’ and resulted in ‘the ageing of the workforce’ (p.40).

The CFA participants ‘singled out the deterioration in the numbers and reliability of volunteers as the single most notable change for the organisation’ and considered that the ‘level of recruitment was ... inadequate for the rapid expansion in the number of fire stations’ (p.40).

A common thread across both arms of the service were ‘concerns regarding the increasing business focus of fire services which was seen to conflict with the emergency services function’ (p.40). There appeared to be a growing division between the new ‘managers’ who had not come through the ranks and the firefighting staff.

In terms of operational risk, all participants ‘indicated that the risk of exposure to hazardous substances has increased significantly over time, including a higher probability of encountering flammable materials or dangerous chemicals at fire’ (p.41).

Additional risk factors were identified relating to ‘the increasing trend for firefighters to be first on scene, combined with the growth of social problems that are manifested as social unrest or increased drug use’ (p.41). The risks were now increasing and diversifying into new sources. This trend was, in turn, related to austerity policies introduced by the Victorian government, which had cut back on the ‘police and ambulance services’ (p.41). There was a distinct view that firefighters had not been ‘equipped to deal with particular situations as well as other emergency personnel’ (p.42).

Classic stress factors identified included the ‘weight of protective clothing and equipment’, the type of duties required (‘dirty jobs’), ‘serious injury to a co-worker, serious injury to a child, multiple motor vehicle and fire victims’ (p.42).

We provide this information as context for the responses from NSW firefighters provided some 10 years later. We were interested in identifying any common themes between the views of the Victorian and NSW firefighters as well as divergences in perspectives. It is true that, given the two research efforts were a decade apart and the organisation of fire services in Victoria has also undergone a major structural shift in terms of the absorption of the MFB and CFA into Fire Rescue Victoria, we are not able to provide a valid comparison between the views of the firefighters in the two states. The views of the Victorian firefighters may, for example, have changed significantly since 2013. But it remains interesting to have the Victorian context.

## 6.4 What are the major stressors for NSW firefighters

The focus group participants were asked to indicate which incidents they considered to be stressful and to identify the ten most stressful incidents in terms of the actual firefighting tasks. The analysis of issues relating to management culture, gender and related organisational issues were dealt with separately (see later). The results are shown in Table 6.2 and are ranked in order of frequency. Participants were also asked to rank the 10 most stressful incidents. Interestingly, the results from NSW firefighters were very similar to those found for Victorian firefighters in 2013 study. The two most stressful incidents involve the death of a co-worker, followed by a fire incident with multiple fatalities. Then came incidents where a child was seriously injured, or there were multiple burns victims. These results are very similar to those reported in Beaton *et al.* (1998) and reflect the same risk profiles that firefighting faces in all jurisdictions.

## 6.5 Shifting sources of occupational stress

Most of the respondents indicated that they thought that the sources of stress associated with their jobs had shifted somewhat over time. Interestingly, the major stress factors were related to more recent developments in the Service, including the fact that firefighters are often confronted with medical incidents that they feel unqualified to deal with, rather than the traditional ambit of firefighting.

An overwhelming sentiment expressed by respondents was that the shifts in the management culture and the broadening of responsibilities at the operational level, had accompanied a diminished support structure for the firefighters.

In this vein, while the respondents opined that the usual fire-related situations that they had to confront daily, and the uncertainty of those situations, were stressful, they considered that they had adequate experience and training to deal with those stresses. They accepted that the job was dangerous and created random situations – ‘part and parcel of the job’.

However, many respondents indicated that the predominant new source of workplace stress came from what they considered to be the mismanagement of the service. This problem ranged from a sense that there was a lack of empathy from management towards the operational firefighters, to budget cuts, inadequate training opportunities, and the imposition of tasks that the staff felt ill-equipped to execute effectively (for example, home safety visits).

The introduction of the new health check regime also has created major stress for firefighters, particularly those who are above 50 odd years of age and have been in the service for some years. The common view was that these checks were not aimed to improve the health and well-being of the firefighters, but, rather, were being used, capriciously in some cases, to end careers.

Another new source of stress in the view of the respondents comes with the increasing awareness of the workplace exposure to carcinogenic risks, which many firefighters, particularly those who admitted to having been in the system for some time, worried that they will have diminished life spans.

*... when I first got in, I knew it could happen and we were increasing our chances. But now knowing it's the WHO category one or whatever it is it does change the way you think about jobs and do you want to go to as many jobs as you used to, or do you wanna go to somewhere that's going to see less jobs?*

Table 6.2 Stressful incidents ranked

<b>Event</b>	<b>% Find Stressful</b>	<b>% Marked top 10</b>
Seriously injured child	100	70
Sudden infant death incident	95	60
CPR/full arrest	95	60
Aid mutilated adult	95	50
Treat injured patient who resembles self/spouse/child	95	50
Suicide	95	45
Witness duty related death of co-worker	90	80
Serious injury of co-worker	90	45
Fire incident with multiple deaths	90	75
Fire incident with multiple burn victims	90	70
Multiple casualty motor vehicle accident	85	45
Adult stabbing victim	85	20
Death of patient after long resuscitation	85	35
Exposure to hazardous chemicals	85	20
Experience career ending injury (self)	85	65
Third degree burn (self)	85	35
Co-worker fire fatality (not witnessed)	80	55
Assist seriously injured friend/relative	80	65
Render aid to dangerous psychiatric patient	80	35
Sexual assault victim	80	30
Attempted domestic homicide victim	75	40
Attempted suicide/drug overdose	75	10
Head injury (self)	75	30
Inappropriate dispatch	70	10
Fracture of extremity (self)	60	10
Adult DOA - natural causes	50	5
Musculoskeletal strain (self)	40	0

In this regard, some respondents indicated they considered fire station practices, where, for example, truck diesel exhaust fumes were contaminating the air quality, were compounding the risk unnecessarily. While there was some acknowledgement that the Service had implemented a carcinogen minimisation program, the respondents considered the budget to back such a program and make it successful was not sufficient. They felt the level of protection was lacking, especially in regional stations.

Further, many respondents stated that there was a culture of ‘bullying and harassment’ within the service:

*It’s criminal, the level of bullying and harassment that goes on, not at a fire station but from management ... I’ve sat down with the psychologist and one of the questions I asked was I’d love to know the statistics on how many people see you around job related stress compared to management related stress. And he laughed and he said, you’re spot on the money.*

They also indicated that some of the new protective gear that had been introduced into the Service in recent years, while providing increased protection from chemicals etc, created new issues, such as, a concern for heat stress and they suggested more firefighters are now requiring medical attention after an incident as a result.

Relatedly, a major theme that emerged in the focus groups was the sense that training standards had declined while at the same time the responsibilities being borne by the firefighters had widened into areas not traditionally associated with the fire services.

We consider these themes in detail in what follows.

## 6.6 Management and Leadership

Most respondents indicated that the changing managing culture within the service had created stress for the operational firefighting staff. There was a sense that priorities had changed within the service and a disconnect had formed between the senior ranks and the operational staff. This perceived shift in culture was accompanied by fiscal cuts and an elevated focus on what the respondents termed ‘optics’.

There were many intertwined sources of stress and morale loss associated with changes to the seniority system, to recruitment processes and access to training opportunities to improve rank.

Many respondents noted what they considered to be a disproportionate growth of management positions in the senior ranks with inflated salaries. They argued that many such positions are filled by younger people without the fireground experience or insight. There has been a major shift towards ‘book knowledge’ in favour of operational fireground experience. This is a common trend in professions where creeping credentialism competes with experience and on-the-job skill development.

Related to the changes that the Service has undergone in recent decades is a perception that the core values of the service have shifted from being a ‘service to the community’ and taken on a ‘business mentality’ with ‘budgetary restraints being imposed by management’ impacting on the scope and quality of outcomes at the operational level.

Respondents considered these dictates were more about advancing the career of the managers through the achievement of KPIs rather than improving the effectiveness of the service or the well-being of the firefighters.

*... we’re basically being asked to do more for less, they want us to do more actual work for less money ... They’re basically dumbing down the fire service even when you look at qualifications they don’t want to provide training ... they dumb the training down.*

This trend appears to have reduced the confidence that operational staff have in senior management. The senior staff are not seen as ‘leaders’, but rather as ‘managers’ intent on achieving KPIs, even if it means compromising the quality of the work environment at the operational level.

The disconnect between the management and the operational staff appears to manifest as a distinct lack of trust.

*I don't know who I can trust anymore. I don't trust any senior officers.*

And another view

*The disconnect with management and the people at Fire station on ground who actually do the work is just growing. Really year on year when I joined the job we had a Commissioner who knew people's name. You know he'd get out the stations. He'd get out the jobs ... whatever anyone thought about him he was very personable. He made a point to know everyone and to really just be out there dealing with people. We now have a commissioner that no one sees. I feel like there's been a push now with everything's about their KPI's. Now everything's about what's good for them? Not what's good for firefighters, and we see that with a lot of the programmes that they try to push out without doing proper consultation without proper thought for the well-being of the workers, I think that's one of the major things that's creating a disconnect between you know the people at the coalface let's say and the people who sit up in the ivory tower in management.*

Another respondent, who indicated they had attended many serious incidents in 2022 involving the full gambit of situations, articulated that the 'most stressful' part of his daily job is 'opening my emails from senior management', which they said invoked fear because of a perceived 'weaponisation of professional standards' to undermine job security.

In this vein, another respondent noted in relation to senior management that:

*They intimidate people, they threaten people. They act in a manner that is unfair. It affects you in the workplace. It affects your interaction with colleagues. It affects you at home. It affects you on your days off. And in the end you have to resort to go and seek private counselling to try and deal with the issues that they create.*

Another respondent, in relation to support for mental health issues said:

*You can go to all the counselling in the world, but when you come back from it, the toxic management is still there so that that for me is why I just don't bother.*

The respondents suggested that this disconnect has eroded motivation at the operational level.

*We don't have the leadership we used or the focus from the leadership to all issues ... be it training, IT support, mental health, be it all ...*

*Motivation drops ... so you find not only are they not supporting us but we stop sort of supporting ourselves.*

The promotional process is also seen by the respondents as being enormously confusing.

*I don't understand how someone who has far less experience than I have can come onto a fire ground and tell me to do things that I know are unsafe, but because of the legislation I have to follow what they're saying, and this is happening at every fire that I go to. I'm very concerned about the safety of my firefighters.*



Some respondents, with senior positions, felt that the management changes in relation to delegation at the station level had undermined morale.

*I can no longer approve temporary changes of annual leave now when people come to me with that, they don't come to me with that because it's something fun to do. They come to that because there's something serious that's going on. In their life, they've got a child that needs to have surgery. They've got a wife who has something debilitating happening or whatever it might be, and sometimes they come to me in highly emotional states. They come to me in tears and I can't approve that leave. I've gotta go to the zone commander. And sometimes he wants the reasons in writing. Which is absolutely dehumanising for that firefighter.*

There was also a sense that the management structure is constantly changing such that it was hard for firefighters to keep track of the section name changes, the rebranding, the merged sections and more. In this regard, the firefighters said that the disconnect meant:

*... that we are two separate organisations and the station response structure now basically has to fend for ourselves.*

## 6.7 Fiscal cuts have compromised the Service

Closely related to the perceived shifts in management culture and structure, was a view that fiscal cuts and so-called 'efficiency dividends' were undermining service quality. All respondents indicated that they felt that 'budgetary constraints', which emerged in the last 10 to 15 years ago and were accompanied by changes in the management structure (extra layers of high paid senior staff) have not only undermined the capacity of the Service to offer more training opportunities but have also reinforced their sense of disconnect between the management and the operational firefighters. It was stated that while the management engaged in what was seen as superficial consultation ('trying to connect on a level ... we want to hear from you about what's wrong about the job'), nothing of substance ever seemed to follow from the interventions.

*... the disconnect has been commensurate with that reduction in money. And basically the structure started to change at the management level, where from a firefighters viewpoint in the station things that have been identified that required to be done just have never got done. And it's interesting that yearly they do a survey - Fire Rescue, do a survey. They've been doing this wanting feedback about you know what things you think are the shortcomings in the job and what needs to be done and where help is needed. Our view after offering, that sort of information is that nothing gets fixed.*

The fiscal cuts were seen to be part of the corporatisation of the service and some respondents believed a lot of effort has gone into promoting 'the impression we give rather than the job we do'. There was a feeling that the senior management prioritised 'spin' rather than actively working to 'support firefighters'. An example given was the millions of dollars spent on the campaign to 'rebrand' the fire service and run the 'we are prepared for anything' narrative, while behind the scenes not providing sufficient funding for training and support to ensure the new responsibilities imposed on the firefighters could be undertaken with minimal stress.

The often-heard complaint within organisations of the increased use of consultants who have limited understanding of the actual workplace demands were aired regularly during the focus groups.

The perceived impact of the fiscal constraints on the provision of training was identified by all respondents as a major failing of the modern service. One of the recurrent themes in the focus groups was that training deficiencies never get fixed, which has eroded confidence at the team level. The sentiment is that the quality of the skill base has been compromised by the budgetary cuts

*... updating your skills and keeping the confidence levels there, it just isn't occurring, and everything's been shifted to a cheaper model.*

*... they're cutting everything everywhere and bit by bit breaking this down effectively.*

*... the resources aren't there ... We don't do the training we used to.*

Many examples were provided during the focus groups, particularly about the rescue operations where there was a distinct sense that staff are not properly qualified to fulfil the responsibilities of the task. The budgetary restrictions meant that staff who were expected to deal with 'hazardous materials' or work on pumps, or rescue duties were unable to access the requisite training, which added stress within their units when called upon to do this sort of work. Firefighters were forced to be on the 'sidelines' within their unit because of a lack of specific training, which created divisions in the teams and reduced the morale of the 'untrained' officers.

## 6.8 Stress from the medical first response issue

The topic of medical first response was canvassed widely by participants in the focus groups. It should be noted that medical responsibilities are yet to be introduced for firefighters in NSW bar the 13 on-call country fire stations, where firefighters are trained by the Ambulance service to the level of Certificate II in Medical Service First Response, which is a nationally recognised award and allows the holder to apply 'basic first aid and emergency responses in the pre-hospital/out of hospital environment' (St. John Ambulance, 2023). None of the participants in the focus groups identified as being located at those fire stations.

So, while the focus group voices did not perform medical work, they disclosed stress related to this issue. The source of this stress was multidimensional.

First, the respondents largely concurred that one of the major stress factors was related to the conflict they felt in having to confront medical first response situations for which they were not fully trained to deal with and a lack of post incident support from the Service. They indicated that increasingly they were the first professionals on the scene of a traumatic incident involving medical casualties and were unable to deal with the situation before them.

The participants considered the decision-makers were blithe to the operational realities where firefighters are confronted with situations, that they cannot adequately deal with but, are left to endure the situational stress while awaiting the arrival of the 'proper professionals' (for example, ambulance services). The medical first response situations are particularly stressful when the firefighters know that there is no ambulance or other appropriate paramedic backup support immediately available at the scene.

Second, there was also major stress when firefighters encountered a medical situation involving a family environment:

*We quite often get there very early in the piece and once you're in that family situation, and the family member is dying in front of the family. That's when the most firefighters would start to feel the impact. It's that human connexion where you are seeing stress of people that are losing a family member or have them in a compromising situation. It it's not that common to have family members standing around at a fire when you find some family member dead. Inside of a building or a car accident, normally you just do your job there with away in the ambulance and you still suffer, but it's a different type of connection, So why would they even consider sending people who aren't trained who aren't confident into that situation. People in front of family that was the biggest fear and I think that's where most of the damage psychologically would be done.*

Third, the participants indicated that, in their words, was the 'constant creep of medical calls despite a formal MFR program, under the guise of assist public, assist ambulance, or concern for welfare', should be differentiated those situations from the more traditional unpleasant fire situations for which they considered they had an adequate skill set to dispense their duties effectively. The respondents indicated that while they sometimes had bad outcomes in fire situations, they knew that they were trained to deal with these situations and had the required equipment. Thus, while the outcomes were at times undesirable and shocking, the level of stress that was generated was manageable. However, in the medical response situations, the lack of training and proper equipment created on-going stress that led to mental illness and poor morale.

*Your partner's gonna die unless the ambos are 4 minutes behind me. And how do I feel? You know, I've gotta carry that for the rest of your life ...*

Fourth, the participants felt that the FRNSW management were pressuring the firefighters to accept MFR responsibilities without adequate consultation. This lack of consultation appeared to be a recurrent theme in the sessions and the firefighters used a more recent example of the introduction of the defibrillator program, which was announced with little input from the operational firefighters.

There was some discussion in the focus groups about the fact that the senior officers carried first aid medical kits and a defibrillator in their department cars but were reluctant to ever get involved in a medical situation, even though 'it's quicker to drive a car through traffic than it is to drive a fire truck'. This sense of disconnect was strong.

Finally, the other source of stress in these situations is the fear that a situation will injure the firefighter and undermine their career. One firefighter captured the anxiety expressed by many:

*My major stress is doing ambulance assist lifts. Well, we go into some difficult circumstances to get people out of places where they've fallen, and they generally don't fall in a nice convenient area for us. Then beside beds, so they're in toilets or in showers. And we're given a job to move some of these people, and they're quite large. Quite heavy. And my concern is that I'm gonna pull something out of my back or a firie is gonna be injured and there goes his job.*

In this context, there was a concern that in regional fire stations or the smaller urban centres the opportunities for an injured firefighter to be assigned 'light duties' were

limited, which meant that a major structural injury (for example, to the back) would signal a career end.

Another respondent noted that:

*And we're not really trained to lift people in bad situations like - we're not supposed to lift any more than 20 kilos. And with straight back bent knees, and that's impossible in some of these circumstances, and we don't have the adequate lifting gear, and we're not trained.*

A common sentiment was that an overstretched ambulance service would call on the fire service to respond to these difficult situations rather than call in the police or other services.

## 6.9 Stress from the annual health checks

The newly imposed health checks that have been introduced are also now a major new source of stress, particularly for firefighters who are above 50 years of age, do not consider they are in a financial position to retire, and do not have relevant skills to find positions outside the fire service.

A common view expressed by all participants is summarised by the following comment:

*I think one of the major things that are affecting a lot of probably the older generation of firefighters are the new draconian health checks that have been introduced and people don't know if they're gonna be able to be working next year because they've got a minor health problem that is deemed to be that they can't work as a firefighter anymore, so that's something that's playing on a lot of people's minds now.*

Another firefighter added that:

*... of all the firefighters on my platoon, the greatest amount of anxiety is caused by these health checks and I mean enormous levels of anxiety, and I think it's a major contributor to the bad feelings that are going through the stations right now.*

There was a sense of betrayal expressed by many older respondents in the sense that for most of their careers, the managers hadn't paid any attention to fitness levels, yet now they are proposing to dismiss older firefighters on health grounds. They wondered why the service failed to create structures to improve the health levels of the operational staff throughout their careers rather than introducing the health checks, which were seen to be a means to end careers.

There was a strong sentiment in each focus group that the new health checks were discriminatory against older firefighters, arbitrary, and caused immense stress. Almost all the respondents considered these checks to be 'over the top' and the insurance company that was contracted by the Department to perform the checks was 'zealous' in their approach.

There was also a sentiment expressed that the administration of the health checks was uncertain and inconsistent. A common view was that a firefighter could go to the 'best specialist in the country' and be cleared as healthy and fit for the job, but then have that opinion countered by the Fire Brigade's GP or by the Independent Occupational Physician. This sense of inconsistency raised suspicions that the health checks were in fact aiming to cull the service of older workers rather than be a legitimate aspect of caring for the workforce.

The respondents relayed stories about cases where the health check would identify arbitrary health flaws, which were considered insufficient to prevent the firefighter from effectively fulfilling their responsibilities, but that these flaws would then be used by the Service to place the career of that firefighter in jeopardy. Many respondents said that the rumour mill was rife with stories such as this which elevated the levels of anxiety that the firefighters felt.

There were also instances reported where an individual firefighter's own doctor would give a clean bill of health, but the insurance company staff would pick up on some small discrepancy in a health parameter and invoke a new investigation which created an environment of stress and anxiety.

Further, several respondents stated that the health checks did not actually test for health problems relating to the risk environment that the firefighters must work within. Specifically, the claim was that if the Service really was interested in the health of the workforce, then why don't they, for example, include voluntary PET scans to test for cancer.

The overall impression gained from the focus sessions was that the health checks were seen as a vehicle to get rid of staff rather than representing a sense of care for the well-being of the firefighters.

It appears that the most stress arising from the health checks is felt by the firefighters post 50 years of age who fear they will lose their jobs and income prematurely because of some relatively minor medical issue.

#### 6.10 School visits and home safety visits

The focus group participants also expressed concern that some of the extra responsibilities that have become imposed on them by management in recent years have not been accompanied by adequate skill development opportunities.

A recurring source of anxiety appears to be the home visits that are now part of the firefighters' responsibilities. The firefighters said that they had received no specific training. They felt that they were often being asked to go into hostile environments where householders were resentful of uniformed officers entering their property without reason.

A common view was:

*... we joined the job to be firefighters, not to be door to door salespeople.*

They considered these visits were more about meeting management KPIs and making it look as if the firefighters are working hard rather than delivering any social value. The view that these extra activities were mostly about managing public expectations and were largely 'make work' tasks was common.

One respondent said:

*I think the difference between us and other emergency services is the police and ambulance are constantly out there working, whereas we spend a lot of the time in the station and there's a perception there for that - lazy. I think that that perception is completely wrong. What people don't understand is that when we do get jobs, those jobs are jobs that could kill us. Are you going into a burning building or they're things like suicides, drownings, shootings, drug overdoses, deceased persons? Scenes that are absolutely horrific in nature. But there's this perception, and as a result of that, there are things that we have to do, like home,*

*fire, safety visits and cold calling, and knocking on doors, etcetera. And I don't see other emergency services out there doing that.*

Other respondents considered that the 'down time' should be spent on skill development through better access to training opportunities. A common view was that:

*... what they call down time could be spent far better if they gave us proper training facilities that were accessible. There's only one training centre in the whole of Sydney, but if it was more accessible to more firefighters we would use it. But getting us to go and knock on people's doors is bad for morale because of the reactions that we get, and you know the firies hate it.*

If the views expressed by the focus group respondents in this regard are broadly representative within the Service, then more work needs to be done by management to articulate why these extra tasks are important and why they should use time that could alternatively be used to reduce the training and skill development backlog. Further, the Service should ensure that increased training in the specific interpersonal skills is provided to ease the stress of firefighters who feel they are being forced to enter hostile environments for which they are not equipped to deal with.

### 6.11 Mental illness and support

The sense of disconnect also played out in relation to the attitude of the firefighters to the peer support system. While they considered the peer support officers tried to fulfill their responsibilities to the best of their abilities, they believed the staff were unqualified for the breadth of issues they were confronted with. The respondents mostly thought that these officers were not adequately prepared to deal with the gravity of the situations that arose from firefighter stress.

*How do you prepare someone that gets called to a concern for welfare and when they walk in there is a person hanging from the rafters by a rope? [Preparation and support is] ... not to the level that the ambulance officers have, and I've suggested this to the brigade that we have trauma psychologists. We have EAP and we have our peer support people which are people that try really hard but it burns them out and the EAP people really don't understand what it is that we are dealing with and there's a massive disconnect between the job that we do, the trauma we experience, and the support services that get provided.*

Some participants related their own personal experience with mental stress and lack of support.

*I suffered PTSD for about five years and it just got horrendously and progressively worse and I tried everything and nothing worked. It impacted on my life in every single way. My family life with my partner and my children. I couldn't go to the shops I couldn't socialise anymore. I ended up with no friends. I began to drink alcohol. I didn't want to get out of bed in the morning. I didn't want to go to work anymore. It was just one train wreck after another for about five years.*

Another response, shared by others in the groups, was that there was growing turnover among staff as the incidence of PTSD within the Service increased.

They all concurred that there was a lack of resources devoted to mental health support. Generally, the participants suggested that the support services provided by NSW Fire +

Rescue were inadequate for the task and that they had to resort to private care to get reasonable assistance when they had problems.

There was a sense that the Brigade didn't really want to know about these sorts of problems. Where official support was provided, the participants considered it amounted to 'ticking boxes off' along the road to satisfying KPIs rather than genuinely trying to come to terms with the workplace issues and stresses experienced by the firefighters. The participants considered the Department adopted a 'band-aid' approach and declined to adequately resource proper interventions.

More importantly, in the context we are discussing here, the firefighters felt distrustful – in the sense that they were not satisfied that the private information they might impart within this system would not be released in some way to management and undermine their employment status.

A common sentiment expressed was that the most effective support came informally through the immediate shift colleagues. However, that sort of reinforcement was more available and effective in small units, where the firefighters tended to 'notice each other's issues' more easily.

*I think for most that would be the case, yeah, and those who don't have a good shift or you know, don't get on well and haven't got that sort of, which is to some degree a bit of luck and personalities and all that sort of thing.*

## 6.12 Gender issues

The KPMG (2010) report analysed the culture, workplace conduct and management practices within the NSW fire service and identified 'instances of unacceptable behaviour' (FRNSW, 2011: 6) and 'highlighted issues surrounding management styles, communication, selection processes, influence of external organisations and diversity' (p.6). The Brigade introduced several changes in response to the harsh assessment by KPMG. ICAC (2011) also found that the management performance on FRNSW was not up to the standard desired. However, problems identified in the KPMG report were still hampering its effectiveness and an enquiry was launched by the NSW Legislative Council in 2017 focussing on bullying, harassment, and discrimination in the Service.

In the foreword of the final report, the Committee Chair wrote (NSW Parliament, 2018: ix):

The committee has been inundated with emergency services workers telling their stories of experiencing bullying, harassment and discrimination in their respective agencies ... It was very clear ... that many emergency services workers have little confidence in the current policies and procedures in place within their respective agencies to manage complaints, and that this distrust cannot only be resolved internally.

Specific to FRNSW, the Committee recommended that additional funding 'to support the mental health and wellbeing of its employees' and that the Service 'implement an internal education campaign regarding the '50/50' recruitment strategy and respectful attitudes towards women' (p. xiii).

The Committee also found that in relation to FRNSW, the 'senior managers were reported as most likely to engage in bullying' (p. 5). However, there was also concern expressed with the incidence of bullying by a 'fellow worker at the same level' (p. 5). A 'disconnect' was also found between the official FRNSW reports of bullying and the

‘number of bullying instances that are occurring’ (p. 141). Even the FRNSW’s own submission to the Legislative Council enquiry presented data showing significant incidence of bullying still occurring in 2016/17 (FRNSW, 2017).

While FRNSW has introduced a range of measures to advance diversity and inclusion and reduce the incidence of bullying, harassment, and discrimination within its ranks, it is clear from the focus groups we conducted that the problem is far from solved.

Input from female focus group participants indicated that they felt stress from the continued gender-based harassment they encountered in the job. While it was apparent that the Service has evolved in this context over time, there was still a perception that it was a ‘boys’ club’ and that woman firefighters were tolerated rather than embraced as equals.

*Just working as a woman in a predominantly male dominated sort of industry, and for the most part you know I would say 90% of people are great, but there is still a lot of both overt and subtle sexism that exists within the job, and it comes at a station level, but also from the management level as well and I’ll give you some examples ... I’ve had people slapped me on my \*\*\*\* at a job and I’ve received sexist comments.*

This respondent also highlighted the lack of safe reporting practices for females in the Service. The usual dilemma that faces women in the broader society appears to be at work in the Service where the female is caught in a bind between reporting harassment and accepting the scrutiny that then follows or remaining silent and allowing the poor behaviour to perpetuate.

*An issue that goes along with that is the lack of safe reporting practises so as a female in this job, if you come forward with information like that, you’re damned if you do, damned if you don’t. Damned if you do because you’re the woman that’s come forward. You’re one of those girls. I’ll stay away from her queue ... stay clear of her you know she’s going to. But if you don’t, you’re perpetuating the cycle that makes these situations not reported, and therefore you know making them more likely to happen again in the future.*

There was general agreement within the focus groups from both male and female participants that female firefighters faced these sorts of challenges and the management had been slow to respond. There was a sense that the management were reactive rather than proactive on gender issues. Many male respondents concurred that there remained a small misogynist element within the fire service, which had resisted any change towards gender-type issues and that the management had failed to force the issue.

Some male respondents indicated that they felt that the introduction of women firefighters in the mid-1980s was not accompanied by adequate efforts to change the workplace culture. They suggested an example of this failure was in the architecture of fire stations which did not promote privacy considerations.

*Firefighters of different sexes and I would even say just firefighters in general should not have to share in a station environment a common shower or a common change room or a common toilet.*

A recurring theme during the focus group sessions in relation to the male officer input was a tension between not wanting to oppose ‘gender diversity and inclusion’ in the ranks, but, at the same time, railing against what they characterised as ‘window dressing’. The relatively recent appointment of a female officer as Deputy



Commissioner, who is overseeing the FRNSW Equity, Diversity and Inclusion efforts to create a respectful and harassment free workplace for the Service, was seen by some participants as an indication that the Service was focused on ‘optics’ rather than actually improving situations on the ground. Some participants thought that there was too much attention focused on these issues at the expense of other important aspects that need remedial input.

The station architecture issues are tied in with the diversity issues. A common view expressed in the Focus Groups was that grand statements about diversity and inclusion from management mean little if there are shared toilets and sleeping arrangements, etc at the stations. But there was also a sense of resentment expressed in this regard from some male respondents, which reflected the fact that before the diversity push by the Fire Service, they had worked in substandard fire station environments only to find that as more women were employed, some improvement in facilities had been implemented. This reflection appeared to contradict the view that the gender diversity push was all ‘window dressing’.

The more substantive issue where the gender issue raised tensions within the focus group participants related to promotion and training opportunities. Equal opportunity campaigns typically attract some resentment among incumbent staff who consider that these policies restrict or undermine their own prospects.

There was some animosity expressed in the focus groups against positive discrimination policies *per se* that were aiming to increase the number of females in the firefighting service. The extreme expression of this was captured by this statement:

*... they want to recruit more females. They don't care what these people present like at interview, they'll just get them in no matter that they're just blind about it.*

While that view was an outlier within the focus groups it does suggest that there are cultural issues that need to be addressed with the Service to make recruitment processes more transparent. There was some confusion between the ‘50/50’ aspiration and the actual recruiting process, which signals a lack of effective communication from the management.

More common was the resentment associated with the perception that female recruits were allowed to ‘jump the queue for rescue courses straight out of college’ when male staff had been waiting for years to get on rescue courses.

*... by letting them jump the queue for courses, it creates resentment at a lower level amongst people that have been waiting years to get on rescue courses that are getting jumped ... Instead of getting rid of nepotism, we just moved the nepotism into a different group.*

There was also a view expressed that instead of trying to dictate recruitment ratios, the Service should take the best candidates and if more women are desired then the government should be running public education campaigns to increase the number of female applicants for positions.

It was hard to gauge from the sessions whether this simmering tension was a demonstration of the known male-oriented prejudices, or, whether it indicated that the Service needs to do better to integrate the valuable equity efforts into a broad framework for improving the daily lot of the operational firefighters, irrespective of gender. It is likely that both factors are at play here. Whatever is motivating these opinions, it

remains that there is an issue that the senior management needs to address to ensure that these simmering tensions are eliminated at the operational level.

### 6.13 Summary and Conclusions

The focus group participants confirmed that many of the issues from the international literature are also issues in FRNSW. The participants concurred that there were major stresses faced in their daily jobs relating to firefighting, but they generally felt that they had the capability to perform these functions effectively, which helped them manage the trauma they faced.

It was unsurprising to learn that the usual stresses that are common to firefighters around the world also are at play within FRNSW: confronting situations; shift work; the uncertainty of what is ahead when the call to go out is made; and the like.

However, the firefighters also indicated that they incurred major stress when dealing with the MFR situations and distressed family members, which were exacerbated by their lack of adequate training which they felt rendered them unable to perform at optimal levels of efficiency. The perception that they were not properly equipped to deal with this aspect of their job was palpable.

Relatedly, while the traditional stressors were consistently identified, the participants noted that a major new stress was the growing sense of dislocation and distrust of the FRNSW management, who were characterised as careerists focused on achieving their own KPIs to advance their own fortunes while neglecting the needs and concerns of the operational firefighters.

This was a very strong resonance throughout the focus groups and indicates a major cultural problem exists within FRNSW.

There were many dimensions outlined in terms of this dislocation: spin versus action; the budget cuts to the service and the efficiency dividend approach imposed by the government had undermined the capacity of the service to perform at high standard; lack of consistency in decision-making by Commanders, lack of support from management; and inadequate funds for training while at the same time being burdened with new responsibilities.

A major new stress identified was the annual health check. The firefighters characterised this as a management strategy to cull older workers from their employment using an arbitrary and at times capricious system of health testing.

The participants also considered the support systems initiated by FRNSW including the peer support program was ineffective and they didn't feel they could trust the confidentiality of the processes. They indicated that informal support at the station-level was the most effective support network but acknowledged that depended on the team personnel and was not consistent across the service.

Ongoing problems with respect to diversity and inclusion were identified by female participants at the focus groups, which indicate that management still has work to do to improve the culture within the Service.

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