Centre of Full Employment and Equity

Occupational health effects for firefighters: The extent and implications of physical and psychological injuries

Report prepared for the United Firefighters Union of Australia, Victorian Branch

Beth Cook and William Mitchell[1]

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Executive summary

The Centre of Full Employment and Equity (CofFEE) was commissioned by the United Firefighters Union, Victorian Branch to research the impact of firefighting from an occupational health and safety (OH&S) perspective. The report reviews:

- The international literature into the physical and psychological health of firefighters, including:
    - 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;
    - The impact of stress on psychological health, including the prevalence of posttraumatic stress disorder (PTSD), depression, anxiety, suicide and substance abuse;
- The effectiveness of mechanisms provided by the MFB and CFA to address the adverse health effects for firefighters; and
- The implications of adverse health effects in relation to firefighters' use of entitlements and unplanned absences.

Fire services in Victoria

Fire prevention and suppression services in Victoria are provided by three organisations:

- The Department of Sustainability and Environment provides services for public land which covers around one-third of the state;
- The Metropolitan Fire Brigade (MFB) is a professional fire service that services Melbourne's CBD, inner and middle suburbs and a large portion of Port Phillip Bay.
- The Country Fire Authority (CFA) provides fire services to the remainder of rural Victoria and parts of metropolitan Melbourne and is staffed by both professional and volunteer firefighters.

The MFB and CFA occupational health and safety provisions include welfare services to assist firefighters deal with psychological issues:

The MFB Employee Support Program is a voluntary program that offers a range of services that are delivered free to firefighters and their families:

- 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.

There are around 50 peers, or approximately one for every 40 staff, who are mainly operational firefighters. Peers in the peer support program have a minimum of six days training, including a two day course in mental first aid. They are then required to attend at least 3 skill sessions per annum.

The CFA welfare services include:

- Peer Support which provides on scene support, psychological first aid or defusing sessions, one to one support, major incident support, referral to psychologist.
- Chaplaincy Support provides pastoral care including spiritual, physical, psychological and emotional care and wellbeing support.
- Psychologist/Counsellor Support (Member Assistance Services) provides professional mental health services to members and their immediate families.

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 160 people who are trained and qualified in peer support which equates to one for every 10.6 employees or one for every 373 when staff and volunteers are included. Peers complete a Certificate III in Community Service that takes 12 months.

Mortality and physical health impacts of firefighting

Firefighters have one of the most dangerous occupations and have higher than average rates of workplace deaths and injuries. They 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 emergency medical response (EMR), motor vehicle accidents, and other emergencies such as floods, earthquakes, cyclones and terrorism.

The corollary of the dangerous and physically demanding nature of the duties of firefighters is that there are higher mortality rates and elevated prevalence of adverse physical health outcomes for this cohort of workers.

- A US study 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).
- In England and Wales, fire service personnel were found to have higher than expected proportional mortality rates (PMRs) for: cancer of the pleura; non-melanoma skin cancer; death from falls; death from injury by fire, drowning, and firearms (Coggon et al., 2009).
- In the US heart attacks are not only a leading cause of on-duty fatalities, there are also a large number of non-fatal heart attacks suggesting that firefighting is a significant trigger for heart attacks (Brown and Stickford, 2009).

Firefighters work in hazardous situations and are exposed to very high concentrations of a range of toxic and carcinogenic chemicals. There are well established carcinogenic effects of a range of substances firefighters are likely to encounter during their career.

- LeMasters et al. (2006) conducted a review and meta-analysis of 32 studies on the link between firefighting and cancer by estimating a summary risk estimate (SRE). They found that there was a probable cancer risk for multiple myeloma, non-Hodgkin's lymphoma, prostate and testicular cancer. Eight other cancers were found to have a possible elevated risk in firefighters: skin, malignant melanoma, brain, rectum, buccal cavity and pharynx, stomach, colon and leukaemia.
- Several studies of US firefighters have identified excess health risks, particularly in relation to a range of cancers including: colon, kidney, non-Hodgkin's lymphoma, multiple myeloma, testicular, melanoma, brain, oesophageal, and prostate cancer (Baris, et al., 2001; Bates, 2007; Kang et al., 2008).
- A New Zealand study found elevated rates of testicular cancer (Bates, et al., 2000).
- A study by Coggon et al. (2009) found that firefighters in England and Wales had higher mortality rates for cancer of the pleura and non-melanoma skin cancer.

These studies establish that firefighters are more susceptible to heart and respiratory diseases and a range of cancers. Despite the fact that it is difficult to establish causal links between firefighting and these diseases, the link has been legally recognised through the passing of presumptive legislation in several jurisdictions, including at the federal level in Australia. This recognition will become more widespread in the near future, including in some Australian states.

Research 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.

Psychological impacts of firefighting

Adverse psychological effects of working as a firefighter emanate from working in situations where physical safety is threatened or attending traumatic incidents such as EMR or motor vehicle calls, as well as inherent characteristics of the job, such as long periods of inactivity followed by periods of high activity (calm to chaos), working shiftwork, and organisational issues, including the adequacy of resources and the degree of management support.

A number of incidents have been identified as causing higher levels of stress in firefighters including: 1) rare incidents such as major disasters and terrorist events; and 2) incidents that firefighters deal with in the normal course of their duties such as witnessing the death or injury of co-workers or patients, sustaining a serious injury, being exposed to hazardous substances, attending multiple fatalities or incidents involving infants and young children.

Much of the research on the psychological impact of firefighting has concentrated on estimating prevalence rates for PTSD, depression and other psychological illness. Prevalence rates have varied substantially depending on the specific group of firefighters studied and the measures used to determine prevalence levels. Estimates for firefighters range from 6.5 per cent to 37 per cent, and are generally, but not always, estimated to exceed prevalence levels in the general population (these estimates also vary considerably).

In the literature it is common to find comorbidity, with people having one or more psychological illness, such as, PTSD, depression, anxiety or substance abuse. A study of US firefighters over a two year period found elevated levels of PTSD and alcohol abuse. PTSD was 26.5 per cent and alcohol abuse was 36.2 per cent at the base period. The rates decreased over the two year period to 22.2 per cent for PTSD and 29.7 per cent for alcohol abuse.

Some studies reviewed in this report have estimated PTSD prevalence for firefighters after specific disasters. 13 per cent of Volunteer firefighters at the site of the Oklahoma City bombing were estimated to have PTSD (North et al., 2002). A number of studies in the aftermath of the WTC estimated the impact on firefighters at similar levels: 12.2 per cent (Perrin et al., 2007), and 12 per cent (Corrigan et al., 2009). A study of volunteer firefighters after the 1983 bushfires in South Australia indicated PTSD prevalence of around 22 per cent.

Other studies have concentrated on specific groups of firefighters. In the US Del Ben et al. (2006) estimated PTSD prevalence at 17-22 per cent while Corneil et al. (1999) found that 22 per cent of US firefighters, and 17 per cent of Canadian firefighters had PTSD. A study of German firefighters estimated the prevalence PTSD at 18.2 per cent, while 27 per cent had a mental illness (Wagner et al., 1998). Prevalence of PTSD in the UK was estimated to be 6.5 per cent (Haslam and Mallon, 2003).

Another possible outcome of occupational stress is suicide. Given the psychological impact of firefighting – higher prevalence of PTSD, depression, anxiety and alcohol or drug use – there is a probability that firefighters may be more likely to commit suicide. It is difficult to determine whether there is an occupational link between firefighting and suicide due to the lack of data or the unreliability of data.

Extensive empirical research has provided insights into the predictors of psychological distress: younger age; single; previous psychological problems; feeling unsafe; being injured; lower feelings of self-worth; lower levels of social support; longer job experience; attending a greater number of traumatic incidents; and lack of control.

A number of protective factors have been identified that reduce the likelihood of psychological distress. These generally belong to coping strategies and social support. Common coping strategies for firefighters include talking to workmates, camaraderie and black humour. Social support operates 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. Research has also found that there are limits to protective factors when firefighters are exposed to extreme stressors.

Knowledge of predictive and protective factors has enabled them to be utilised in OH&S models that identify and address risks. While preventing adverse impacts is the overriding objective of these plans, in the case of firefighters there are risks that cannot be eliminated. It is important to train staff to recognise the signs of psychological problems and have effective strategies in place to provide support for affected staff.

The CISM model consists of eight core elements and is widely utilised. The elements 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.

Findings from focus groups of Victorian firefighters

Three focus groups were conducted with professional firefighters from the MFB and CFA. The major changes identified in recent decades included the introduction of EMR and the ageing of the workforce in the MBF due to a 10 year freeze on recruitment from the early 1990s. CFA participants singled out the deterioration in the numbers and reliability of volunteers as the single most notable change for the organisation. The lack of availability of volunteer firefighters to respond to incidents was raised as a major issue that frequently results in insufficient numbers on the fireground.

Participants were asked to rank the **most stressful incidents**, which were:

1. Co-worker fire fatality (not witnessed)
2. Witness duty related death of co-worker
3. Fire incident with multiple deaths
4. Sudden infant death incident
5. Seriously injured child
6. Death of patient after long resuscitation
7. Assist seriously injured friend/relative
8. Serious injury to a co-worker
9. Multiple casualty motor vehicle accident
10. Exposure to hazardous chemicals

Stressors

The major aspects of the job that caused stress for firefighters were:

- **EMR** was considered to be the most stressful work, both in dealing with particular incidents and with distressed family members. EMR is currently being trialled in the CFA but staff were apprehensive about the future roll out and face the added stress of potentially being on scene for longer periods of time than their counterparts in the MFB before the paramedics arrive.
- **Exposure to asbestos and hazardous chemicals.** While both services have procedures for dealing with asbestos, there were concerns about the lack of specific training and adherence to procedures. Participants felt that exposure to potentially dangerous chemicals had increased over time. The impact of these exposures takes a toll on individuals and their families, both in relation to adverse health impacts and the emotional strain.
- **Training**. Difficulty accessing training such as driving courses for recruits, specialist courses and refresher courses was mentioned and some participants stated that additional training was required to equip firefighters with the skills to deal with families during EMR or accident calls.
- **Organisational pressures** included:
    - For the CFA employees the level of manning emerged as a major issue that impacted on their performance. This was a particular concern when a three man crew attended structure fires where a person could be trapped inside the building. The lack of staff also impacts on other firefighters who are required to work overtime to maintain minimum manning levels.
    - Shiftwork has adverse impacts on sleep patterns and health.

- Lack of response from volunteers results in longer response times and the probability of an inadequate weight of response, particularly in a climate of rapid population growth.
- Other stressors included: lack of consistency in decision-making by Commanders in operational situations; lack of support from management; the impact of budget cuts; problems with interoperability when working with volunteers and other agencies.

Participants suggested that there should be **one fire service for Victoria**, stressing that the current situation of different standards of cover and the incompatibility of equipment are major problems.

The psychological impact of stress

Themes that emerged during the focus groups included: the impact of the general lack of time to debrief after incidents; the impact of particular incidents and cumulative stress on individuals; the negative psychological impacts of EMR; concerns about future impacts of EMR, especially in the CFA; lack of support from management; drinking to cope; and the impact on families.

While it was recognised that PTSD could result from a single incident the majority view was that PTSD was much more likely to result from cumulative stress. Participants were concerned that the intensity and level of exposure increased over time and left all firefighters vulnerable to PTSD as their career progressed, and even after retirement, when they lost the support of co-workers. Some participants expressed a belief that many firefighters suffered from undiagnosed PTSD or depression which impacted on work performance as well as the individual's health.

One participant indicated that several firefighters had committed suicide and raised concerns about the link between suicide and firefighting. Just as the use of alcohol to cope has been a feature of international research into the coping strategies of firefighters, focus group participants indicated that alcohol was used to relieve stress.

The adverse impact of firefighting on family life was a feature of the discussion. Participants spoke about missing family events such as birthdays, Easter and Christmas as well as mission children's sporting and school events on a regular basis. The fact that firefighters work shiftwork was seen as an added pressure on families. Some participants recounted specific instances where their family had expressed fears relating to dangerous jobs.

Effectiveness of OH&S provisions

One of the major obstacles to the success of support and welfare programs identified in the literature is the reluctance of firefighters to use the programs. Reasons provided for firefighters not being prepared to use programs included: 1) the macho nature of the job and the "rescue mindset" of concentrating on helping others; 2) a preference for informal mechanisms such as talking to shift-mates; 3) reluctance to expose any weaknesses to fellow workers or management; and 4) lack of confidence in the CFA program.

Despite the fact that both the MFB and CFA have specific programs designed to minimise or prevent adverse psychological effects, a major theme of the focus groups was the perception that there was inadequate support from management, particularly for CFA members. This perception of lack of support from management presents a significant problem for the successful implementation of the welfare programs established to deal with psychological stress.

The discussion in the focus groups revealed a dichotomy in participant's appraisals of peer support programs. In the MFB the peer support program was viewed in a positive light. A major criticism of the CFA program was the selection of the peer support personnel who are predominantly volunteers and therefore perceived as inappropriate for assisting professional firefighters, due to their lack of experience on the job.

Informal support

Participants identified workmates as the primary informal support mechanism. In particular, they expressed the importance of informal chats at the station after a stressful job, drinks after work and the use of black humour.

Participants expressed mixed feelings about confiding in family. While the ability to discuss stressful incidents with partners was seen as a valuable support, several participants stated that they did not want to burden them with additional stress, especially when they were already under pressure dealing with the dangerous aspects of the job and shiftwork. Some also felt that family members were not able to provide the same level of support as co-workers because they did not have the same experiences.

The impact of physical and psychological illness on work attendance

Workplace injuries are accompanied by substantial economic and social costs. Estimates of economic costs vary significantly. According to Safe Work Australia (2012) the total economic cost of work-related injuries in 2008-09 was $60.6 billion or 4.8 per cent of GDP. These costs included direct costs and indirect costs such as lost productivity, lost income and quality of life.

Australian estimates of the cost of **unplanned absences** (sick leave, family leave and compensation) vary significantly. Absenteeism has been estimated to cost Australian businesses between $7 billion and $30 billion per annum. Depression had been estimated to be responsible for 29 per cent of costs associated with absenteeism due to chronic illness.

The evidence presented in this report suggests that that the physically and emotionally demanding role of firefighters, combined with the impact of shiftwork, should result in higher physical and psychological injuries, and therefore higher levels of workplace absence.

Shift workers in Australia have around twice the rate of workplace injuries as the workforce as a whole; they accounted for 16 per cent of employed persons but 28 per cent of workplace injuries in 2009-10. In 2005-06, 69 shiftworkers were injured per million hours worked while only 35 non-shiftworkers were injured per million hours worked.

WorkSafe Victoria data on workers' compensation claims for Victorian firefighters showed that between July 2002 and June 2007 there were 907 claims for workers' compensation from Victorian firefighters, an average of around 181 claims per annum. The largest proportion of claims relate to physical injuries to the back (24 per cent), knee (19 per cent), shoulder (11 per cent) or leg (8 per cent). In total 7 per cent of claims pertained to the psychological system which equates to around 63 claims over the five year period or approximately 13 per annum. During this period, psychological injuries accounted for approximately 9 per cent of all workers compensation claims in Victoria and this rose to 10 per cent by 2011-12.

The MFB provides data on the proportion of shift staff absences due to unplanned absences which include sick leave, family leave and compensation. Between 1997-98 and 2011-12, unplanned absences increased from 7.0 per cent to 8.8 per cent. While sick leave has decreased from 5.7 per cent to 4.4 per cent this has been more than compensated for by a large increase in family leave; from 0.5 per cent to 3.2 per cent. Similarly, workers compensation leave has increased from 0.8 per cent to 1.2 per cent.

Why do firefighters have high levels of unplanned leave?

The inherent nature of firefighting means that firefighters are exposed to much greater risk of injury or death than most other workers. We would expect the higher injury rate emanating from the type of work to be exacerbated by the fact that firefighters are also shiftworkers (the injury rate for shiftworkers is around twice the rate for non-shiftworkers). The corollary of higher injury rates is more time off work in the form of workers' compensation or sick leave:

- Exposure to hazardous substances has resulted in firefighters having higher rates of work-related illness such as cardiac and respiratory diseases and cancer. Compared to other workers, employees with these types of illnesses require significantly more time off work to manage the symptoms and receive medical treatment.
- Moreover, the physical demands of the job dictate that firefighters must be 100 per cent fit in order to attend work. Focus groups strongly emphasised that the number of absences and their duration were related to the physical fitness requirements and the ageing workforce. This has also been acknowledged by employers:

  An illness which may mean that a firefighter is not fit for duty may not affect attendance in other occupations. While firefighters are fitter when they are young, they are ageing and so take longer to recover from illness or injury MFESB (2007: 2).
- High levels of exposure to traumatic incidents and the resultant psychological impacts such as PTSD, depression and anxiety, increase the necessity to take time off work. Lost time associated with claims for PTSD is between 2 and 4 times the average length of time (Comcare, 2008).
- Organisational issues are also an important factor in the incidence of absences. Comcare (2008: 14) reports on a study that found 'that up to 60 per cent of psychological injury claims are preventable by improving morale, supportive leadership and the work team climate.' The findings from the focus groups indicate that employees of both the MFB and CFA feel that there are numerous operational issues that impact on morale, including the perception that they receive low levels of support from management and government. Such issues have been documented in the past. For example, a study by Deery and Iverson (undated: 11) noted:

  The creation of a more co-operative and harmonious relationship between MFESB, the United Firefighters Union and firefighters will increase the commitment of employees to MFESB and reduce absenteeism. Such a relationship requires that the MFESB behave in a manner which encourages employee involvement, responds to firefighters suggestions, shares information, and seeks improvements through joint problem solving.

Recent cuts to the budgets of the MFB and the CFA do not auger well for implementing effective strategies to minimise workplace stress such as ensuring adequate staffing and operational capacities (Comcare, 2008). Funding cuts may have serious implications for operational effectiveness and further damage morale. This topic was raised by several focus group participants who expressed concerns about the impact of budget cuts on their ability to provide efficient and effective front-line services. Budget cuts will increase the already high levels of stress that firefighters operate under and could increase absences through higher rates of psychological injury and lower morale, as well as reducing the effectiveness of fire protection to the community.

1 Introduction

1.1 Purpose of the report

The Centre of Full Employment and Equity (CofFEE) was commissioned by the United Firefighters Union, Victorian Branch to research the impact of firefighting from an occupational health and safety (OH&S) perspective. The report reviews:

- The international literature into the physical and psychological health of firefighters, including:
  - 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;
  - The impact of stress on psychological health, including the prevalence of posttraumatic stress disorder (PTSD), depression, anxiety, suicide and substance abuse;
- The effectiveness of mechanisms provided by the MFB and CFA to address the adverse health effects for firefighters; and
- The implications of adverse health effects in relation to firefighters' use of entitlements and unplanned absences.

1.2 Background

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.

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 emergency medical response (EMR) has exposed firefighters to additional types of stress. EMR is currently being delivered by the MFB and trialled by the CFA. When EMR is extended to the whole state it will create additional workload and stress for CFA firefighters.

The federal government has established 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 CO2 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 South Eastern 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 and uncertainty around future extreme weather events, there are pressures on both the MFB and CFA due to funding cuts of around $66 million in the last state budget. 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.

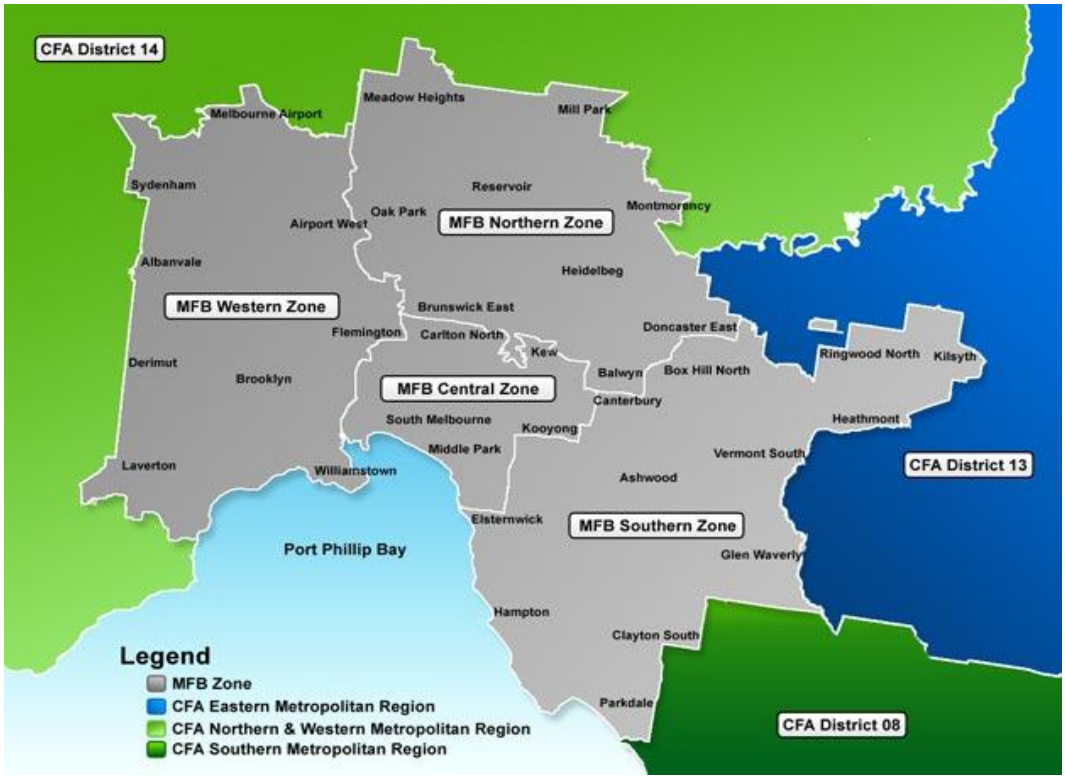
1.3 Fire Services in Victoria

Fire suppression and prevention services in Victoria are provided by three organisations:

- The Department of Sustainability and Environment services public land which covers around one-third of the state;
- The Metropolitan Fire Brigade (MFB) is a professional fire service that covers Melbourne's CBD, inner and middle suburbs and a large portion of Port Phillip Bay.
- The Country Fire Authority (CFA) provides fire services to the remainder of rural Victoria and parts of metropolitan Melbourne and is staffed by both professional and volunteer firefighters.

This report focuses on professional firefighters employed by the MFB and CFA. Figure 1.1 shows the MFB and CFA boundaries in Melbourne. The MFB area of operation is the grey area which is divided into four zones: Central, Northern, Western and Eastern. The remainder of the metropolitan area and the remainder of the state is the responsibility of the CFA.

Figure 1.1 MFB and CFA boundaries



Source: http://www.cfa.vic.gov.au/about/cfa-and-mfb-boundaries/

Note: the MFB Districts have been altered since the publication of the above map

1.3.1 Overview of the MFB and CFA

The MFB provides services to around 4 million people and an area of 1,000 square kilometres. The MFB has 47 stations across 26 local government areas. There are around 2,000 employees comprising approximately 1,800 firefighters and 200 corporate and technical support staff. The MFB is funded by statutory contributions: 12.5 per cent from the state government; 12.5 per cent from local government; and 75 per cent from insurance companies.

The functions of the MFB include response to:

- Fires (structure, non-structure and bushfire);
- Hazardous incidents;
- Automatic alarm response (including responses to false alarms);
- Road Accident Rescue;
- Emergency Medical Response (EMR); and
- Other incidents (including High Angle Rescue, Urban Search and Rescue and Marine Response).

The CFA provides similar services to the remainder of the metropolitan area and all of rural and regional Victoria. The CFA has 1218 brigades with a total of 2,237 employees and 55,240 volunteers (CFA, 2012). The employees are composed of 681 professional firefighters and 1,556 support staff. Of the volunteers, only 38,319 are classed as operational. Total CFA

funding for 2011-12 was $517.7 million, with around 22.5 per cent provided by the state government and 77.5 per cent sourced from insurance premiums.

The majority of Victoria's population growth in recent years has been in areas covered by the CFA, including Melbourne suburbs and regional Victoria. In response to growing need, the CFA agreed to provide an additional 342 career firefighters and build or modify 10 fire stations. According to the CFA 2011-12 Annual Report the first stage has created 65 career firefighters positions with 35 currently working (CFA, 2012).

The MFB includes in its Standard of Fire Cover (SOFC) a target response time from call received to first appliance in attendance as 7.7 minutes at the 90th percentile, and to contain 90 per cent of fires to the room of origin (MFESB, 2009:12-13). It additionally aims for a second truck to be on the scene in 10 minutes (Haywood and Groenhart, 2010). In 2011-12, the MFB attended 88.1 per cent of calls within their benchmark times and 90.6 per cent of structure fires were contained to the room of origin (MFB, 2012a).

The CFA requires a first truck with four firefighters to attend a (non-remote) fire in 8 minutes and a second truck within 10 minutes, and reported in 2011-12 that in 25,144 incidents that were classified as "emergency incidents" for measurement purposes, 88.1 per cent met the required response time for the hazard attended (CFA, 2012). In 2011-12, 65 per cent of structure fires were contained to the room of origin but performance varied considerably. In the Grampians only 53 per cent of structure fires were contained to the room of origin, while this was the case for 73 per cent of structure fires in the Southern Metropolitan area (CFA, 2012).

1.3.2 Emergency response role

Firefighters in Victoria perform an emergency response role whereby they are dispatched at the same time ambulance staff for "Priority 0" emergency medical incidents, events that constitute the highest probability for cardiopulmonary arrest.[2] The MFB Emergency Medical Response (EMR) program commenced in Melbourne in 1998 with a pilot program that ran from July 1998 to Feb 2001. A review of the program found that both response times and time to defibrillation were reduced in the pilot areas. The program was extended to all MFB areas in October 2001. The MFB responds simultaneously with the Ambulance Victoria to all life threatening medical emergencies: cardiac arrest, severe breathing difficulties, drowning, suicide and drug overdoses.

The CFA emergency response trial commenced in 2011 at Cranbourne, Dandenong, Hallam, Shepparton and Springvale. EMR crews consist of an officer and 2 firefighters and must have a minimum of 2 EMR qualified personnel. The role of the Emergency Medical Responder is to provide patient care at the scene of medical emergencies (CFA, AV and MFB, 2011: 1-2):

- Assess dangers and control these to prevent additional injuries to the patient and minimise risks to emergency personnel;
- Gain access to the patient;
- Rapidly assess whether there is any immediate life threat to the patient, and, if so, provide emergency life support;
- Assess other major medical problems and initiate first aid; and
- Relay information to Ambulance Victoria and had over patient care to AV officers as soon as they arrive on the scene.

A review of the first seven years of the EMR program of the MFB by Boyle et al. (2010) revealed that 54 per cent of incidents attended were cardiac arrests, 19 per cent were other medical emergencies and 11 per cent were drug overdoses. Firefighters provided initial care in 57 per cent of cases, spending an average of 4.8 minutes with patients prior to handing over to paramedics. The average response time was 6.1 minutes.

1.3.3 Support programs

Both the MFB and CFA operate employee support programs. The MFB Employee Support Program is a voluntary program that offers a range of services that are delivered free to firefighters and their families:

- 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.

There are around 50 peers, or approximately one for every 40 staff, who are mainly operational firefighters. Peers in the peer support program have a minimum of six days training, including a two day course in mental first aid. They are then required to attend at least 3 skill sessions per annum. These may include aspects such as: drug and alcohol; parenting issues; and financial issues. Past sessions have included presentations from Post Trauma Victoria and presentations on cyber-bullying (Community Development and Justice Standing Committee, 2012a).

The CFA welfare services include:

- Peer Support which provides on scene support, psychological first aid or defusing sessions, one to one support, major incident support, referral to psychologist.
- Chaplaincy Support provides pastoral care including spiritual, physical, psychological and emotional care and wellbeing support.
- Psychologist/Counsellor Support (Member Assistance Services) provides professional mental health services to members and their immediate families.

It is mandatory for the CFA to offer welfare services for critical incidents:

- Line of duty death;
- Serious injuries directly to CFA members;
- Suicide;
- Prolonged incidents;

- Multiple deaths, serious casualties or death of children;
- Death or injury of persons known to members of the brigade at an incident where CFA are in attendance;
- Major incidents; and
- EMR

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 160 people who are trained and qualified in peer support which equates to one for every 10.6 employees or one for every 373 when staff and volunteers are included. Peers complete a Certificate III in Community Service that takes 12 months. The peer support program costs around $150,000 per annum which includes ongoing training and skills maintenance (Community Development and Justice Standing Committee, 2012b)..

There are about 25 Chaplains throughout the state. They hold psychology qualifications and work closely with peers in the local region. Chaplains are supplied by the contracted provider, Converge International, and are paid. The annual budget is $200,000 but actual costs are usually lower.

The psychologist/counsellor support provides three free sessions for members and immediate family members. For more serious illnesses such as PTSD, major depression or anxiety the psychologist manages referral to the workers compensation system. The total annual budget for all three programs is about $500,000.

1.4 Structure and content of the report

This study consists of two components:

1. The literature review consists of a search of academic and grey literature on the health aspects of firefighting. The report then synthesises the literature and provides an overview of major research questions, measures of physical and psychological impacts of firefighting, as well as predictors of adverse impacts and best practice in managing occupational risks relating to the psychological health of firefighter; and
2. An examination of the current situation in Victoria for both the MFB and CFA regarding knowledge of health impacts of firefighting, strategies to prevent or minimise adverse health outcomes and the implications of OH&S outcomes for leave-taking. This includes:
    a. Reviewing departmental literature and publicly available data, such as Workers' Compensation data. The review includes an outline of MFB and CFA procedures to ensure the occupational health and safety of workers and the support services that have been established to assist affected staff; and,
    b. Focus groups of firefighters and ex-firefighters to gain an in-depth understanding of the health impacts of working as a firefighter, particularly in relation to adverse psychological effects such as PTSD, depression, anxiety, suicide and substance abuse. The focus groups will canvass opinions of firefighters on the adequacy of services currently available to assist firefighters deal with stress, and the types of strategies and services that would provide maximum benefits to firefighters dealing with traumatic events and ongoing or cumulative stress.

The report is structured as follows. Chapter 2 reviews the literature on the physical health impacts for firefighters, including exertion, and elevated risks of developing cancer as a result of exposure to highly toxic substances. Chapter 3 examines the literature on psychological impacts of the firefighting occupation. Firstly, we consider studies of the prevalence of various types of psychological illnesses and outcomes. The second stage of the review involved examining the types of factors that are associated with the onset of adverse psychological effects, the risk or predictive factors and those factors that are associated with resilience, the protective factors. We then review the types and strategies that employers may use to protect employees from psychological distress and best practices that have been identified to assist firefighters to deal effectively with the effects of stress.

Chapter 4 presents the findings of three focus groups conducted with current and former employees of the MFB and CFA. The focus groups identified the types of stresses that Victorian firefighters face in the course of their work and the impact of both individual traumatic incidents and the cumulative stress of the job on psychological functioning. Participants also commented on the adequacy of workplace support and programs to assist those suffering with stress, such as the peer support program.

Finally, Chapter 5 provides an analysis of the outcome of physical and psychological stressors in relation to injuries, workers' compensation claims and total unplanned absences. Where possible, the outcomes for the MFB and CFA are examined in comparison to the Australian workforce.

2 Physical health impacts of firefighting

2.1 Background

Firefighters have one of the most dangerous occupations and have higher than average rates of workplace deaths and injuries. They 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 emergency medical response (EMR), 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).

In addition to the inherent physical demands of the job, firefighters are also exposed to numerous hazardous materials, including, asbestos, carbon monoxide, hydrogen cyanide, nitrogen dioxide, sulphur dioxide, hydrogen chloride, aldehydes, benzene and diesel fumes (Guidotti and Clough, 1992). Exposure to dangerous substances has resulted in a higher likelihood of firefighters developing a variety of cancers. Guidotti and Clough (1992) explain that the introduction of protective equipment has made firefighting safer but has also resulted in an increase in physical exertion due to the increased weight of clothing and equipment. Exposure to radiant heat can result in skin changes such as erythema and telangiectasia.

This section surveys the 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.

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 the rigours of the recruitment process, so findings of adverse health impacts for firefighters are likely to be understated to a greater extent than for the workforce as a whole.

2.2 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).

2.3 International evidence of adverse health impacts

There is substantial evidence that firefighters have elevated rates of a number of 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-butadience causes leukaemia and lymphoma (Landrigan et al., 2005).

In the US, heart attacks are not only a leading cause of on-duty fatalities, there are also a large number of non-fatal heart attacks (Brown and Stickford, 2009).[3] 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. One incident captured by the study involved the rescue of children entrapped on the second floor of a fully involved residence. The incident resulted in

> severe physical and emotional stress on the firefighters driving heart rates to levels in excess of 100% 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 in excess of 100 beats per minute. Essentially, the physical and emotional triggers for heart attack stay with the firefighter for some time after an incident. High levels of stress present long after an incident, is a potential trigger for cardiovascular events, especially in individuals with underlying cardiovascular disease (Brown and Stickford, 2009: 70).

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., 1995) or are unable to separate heavily exposed from lightly exposed firefighters (Landrigan et al., 1995). The methodological problems, including comparisons between firefighters and the general population (e.g. the healthy worker effect), are likely to underestimate the risks to firefighters and dilute associations (Guidotti, 2005; Landrigan et al., 1995).

Some of the measures that have been used to identify associations between firefighting and disease include:

- Standardised Mortality Ratio (SMR) – an SMR greater than 100 indicates that the observed number of deaths is greater than the expected number of deaths;
- Proportionate Mortality Ratio (PMR) – a PMR greater than 100 indicates observed deaths in excess of expected deaths.
- Odds Ratio – an odds ratio greater than 1 indicates a higher than expected incidence
- Standardised Morbidity Odds Ratio (SMOR) – an SMOR greater than 1 indicates that the observed incidence is greater than expected.

The work of Guidotti has been important in examining cancer risk for firefighters. Guidotti and Goldsmith (2002) considered studies that examined brain, bladder and kidney cancer, non-Hodgkin's Lymphoma and Leukaemia. They found a strong association between brain cancer, non-Hodgkin's lymphoma, leukaemia, bladder cancer and kidney cancer and concluded that there was a probable link between firefighting and these cancers. Guidotti (2003) extended the analysis to include myeloma, testicular and lung cancer. The studies examined indicated a presumption for bladder, kidney and testicular cancer based firmly on excess incidence of these diseases in firefighters. There was an elevated risk for brain cancer, non-Hodgkin's lymphoma and leukaemia. There was also a presumption for lung cancer for non-smokers.

LeMasters et al. (2006) conducted a review and meta-analysis of 32 studies on the link between firefighting and cancer by estimating a summary risk estimate (SRE). They found that there was a probable cancer risk for multiple myeloma (SRE of 1.53), non-Hodgkin's lymphoma (SRE of 1.51), prostate (SRE of 1.28) and testicular cancer (SRE of 2.02). Eight other cancers were found to have a possible elevated risk in firefighters: skin, malignant melanoma, brain, rectum, buccal cavity and pharynx, stomach, colon and leukaemia.

Several studies of US firefighters have identified excess health risks, particularly in relation to a range of cancers. A sample of individual studies is summarised in Table 2.1. Baris et al., (2001) conducted a retrospective cohort mortality study of 7,789 Philadelphia firefighters from 1925 to 1986. They calculated standardised mortality rates (SMRs) for firefighters and compared them with mortality rates for white males. They found that firefighters had increased mortality rates for colon cancer and ischemic heart disease. For firefighters with at

least 20 years of service, there were elevated risks of mortality from colon cancer, kidney cancer, non-Hodgkin's lymphoma, multiple myeloma and benign neoplasms.

Bates (2007) studied all male cancers in California during the period 1988-2003 and calculated odds ratios for firefighters for various types of cancer. Firefighters were found to have an elevated risk of testicular cancer (odds ratio of 1.54), melanoma (odds ratio of 1.50), brain cancer (odds ratio of 1.35), oesophageal cancer (odds ratio of 1.48) and prostate cancer (odds ratio of 1.22).

In a study of Massachusetts firefighters between 1987 and 2003, Kang et al. (2008) used a standardised morbidity odds ratio (SMOR) to examine cancer risk by occupation. The study found that firefighters had a moderately elevated risk for colon cancer (SMOR=1.36) and brain cancer (SMOR=1.9). There was weaker evidence for increased risk for bladder cancer, kidney cancer and Hodgkin's lymphoma.

Coggon et al. (2009) analysed mortality rates by occupation in England and Wales between 1991 and 2000 using proportional mortality rates (PMR) by occupation. PMRs represent the proportion of observed deaths to expected deaths for the population aged 16 to 74 years after adjusting for age and social group (to reduce the confounding impact of non-occupational factors). Fire service personnel were found to have higher than expected PMRs for: cancer of the pleura (PMR of 223); non-melanoma skin cancer (PMR of 268); death from falls (PMR of 129 from unspecified falls and 161 for other falls); death from injury by fire (PMR of 274); drowning (PMR of 1970); and firearms (PMR of 567).

A retrospective cohort study by Bates et al. (2000) investigated whether firefighters in Wellington had higher than expected risks of mortality or cancer, especially testicular cancer. They matched data from a register of all NZ firefighters who had worked for at least one year as a paid firefighter between 1977 and 1996 with mortality and cancer records and calculated standardised incidence ratios (SIRs) and standardised mortality ratios (SMRs). They compared the results for firefighters with expected numbers based on the entire population adjusted for age. The analysis revealed that the overall mortality rate for firefighters was below what would be expected. This could be related to the healthy worker effect discussed previously. Similarly, the overall cancer incidence was as expected. However, the higher incidence of testicular cancer was unlikely to be due to chance. For the total period the SIR for testicular cancer was 1.55. For the period 1990 to 1996 the SIR was 2.97 which indicated that firefighters were around three times as likely to have testicular cancer as the general population.

Table 2.1 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.

2.3.1 The state of play in Australia

The literature search failed to find Australian studies of the physical impact of firefighting. Monash University is currently conducting a retrospective cohort study commissioned by the Australasian Fire and Emergency Service Authorities Council (AFAC) 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.

Details of the study are available at www.coeh.monash.org/ausfireftr.html. The cohort will include around 215,000 male and female firefighters. Data collection is expected to be completed in 2013. The study will provide data on cancer prevalence and death rates for firefighters and subgroups which will be compared to the general population and will inform strategies to protect firefighters in the future.

2.4 Legal acceptance of occupational health impacts of firefighting

The link between firefighting duties and cancer has been recognised in law in a number of 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).

Since 2002, nine of the twelve Canadian jurisdictions have enacted presumptive workers' compensation legislation that assumes certain cancers are occupationally caused after varying periods of time working as a firefighter, unless proven otherwise. Details of provisions in four provinces are shown in Table 2.2.

Table 2.2 Presumptive workers' compensation provisions for cancer, Canada

Primary Site Cancer	Minimum period of exposure (years)			
	Alberta	Manitoba	Ontario	British Columbia
Primary leukaemia	5	5	15	5
Primary site brain cancer	10	10	10	10
Primary site bladder cancer	15	15	15	15
Primary site lung cancer	15[a]	15		15
Primary site ureter cancer	15	15	15	15
Primary site kidney cancer	20	20	20	20
Primary site colorectal cancer	20	15	10[b]	20
Primary site testicular cancer	20	10		20
Primary site oesophageal cancer	25	25	25	25
A primary non-Hodgkin's lymphoma	20	20	20	20
A primary site prostate cancer	15	15		
A primary site skin cancer	15	15		
A primary site breast cancer	10	10		
Multiple myeloma	15	15		

Notes: a in non-smokers
b. under 61 years when diagnosed

Source: Workers' Compensation Act, Firefighters' Primary Site Cancer Regulation, Alberta Regulation 102/2003, Province of Alberta; Manitoba Regulation 160/2005R Firefighters Minimum Periods of Employment and Non-Smoking Regulation; Ontario Regulation 253/07; Firefighters Occupational Disease Regulation (B.C. Reg 125/2009)

Similarly, many United States jurisdictions have presumptive disability laws that assume the cardiovascular diseases, certain cancers and certain infectious diseases are job-related unless proven otherwise. This is not the case for federally employed firefighters who are required to nominate a particular incident of exposure that caused the disease. The *Federal Firefighters*

Fairness Bill 2011 was introduced in March 2011. The Act assumes that diseases contracted by firefighters, including heart disease, lung disease, tuberculosis, hepatitis, human immunodeficiency virus, and specified cancers were employment related. The Bill was sent to a congressional committee for consideration and has not been enacted at this time.

In Australia, the situation is reversed with presumptive legislation at the federal level, whereas the vast majority of firefighters are employed at the state level and are covered by state workers' compensation legislation and regulations.

The *Safety, Rehabilitation and Compensation Amendment (Fair Protection for Firefighters) Act 2011* was passed in the Australian Parliament and came into effect on 7 December 2011. The Act provides presumptive workers' compensation provisions in relation to firefighters employed in the federal sphere (including volunteers) in the event that they contract certain types of cancers. A Senate Inquiry into the provisions of the Act considered the scientific evidence and concluded that:

> …science tells us that if a firefighter with a certain number of years of service develops cancer, that cancer is *most likely* to be caused by occupational exposure to carcinogens. Not *definitely* caused by occupational exposure, but most likely. In that light, any potential lack of absolute scientific consensus-which is incidentally absent in most fields of study-becomes immaterial (Department of Education, Employment and Workplace Relations, 2011: 12).

The Act covers around 2,800 firefighters or approximately eight per cent of Australian firefighters (Department of Education, Employment and Workplace Relations, 2011). The diseases covered by the Act are shown in Table 2.3.

Table 2.3 Cancers covered by Fair Protection for Firefighters Act

Cancer	Duration of employment
Primary Site brain cancer	5 years
Primary site bladder cancer	15 years
Primary site kidney cancer	15 years
Primary non-Hodgkin's lymphoma	15 years
Primary leukaemia	5 years
Primary site breast cancer	10 years
Primary site testicular cancer	10 years
Multiple myeloma	15 years
Primary site prostate cancer	15 years
Primary site ureter cancer	15 years
Primary site colorectal cancer	15 years
Primary site oesophageal cancer	25 years
A cancer of a kind prescribed for this table	The period prescribed for such a cancer

Source: Safety, Rehabilitation and Compensation Amendment (Fair Protection for Firefighters) Act, 2011

South Australia is expected to be the first Australian state to enable firefighters to claim workers compensation on a presumptive basis. The Labor Government has undertaken to regulate to have the system in place by mid-2013 (WorkplaceOHS, 2012). The proposal is modelled on the federal legislation and will cover the same diseases.

A private members Bill, *The Western Australia Workers' Compensation and Injury Management (Fair Protection for Firefighters) Amendment Bill 2012,* was introduced into the Western Australian parliament in 2012 but was not passed by the parliament. The Liberal government has subsequently pledged to introduce presumptive legislation after the March 2013 election. The Emergency Services Minister, Mr Buswell, stated that the legislation would be superior to that proposed by the Labor Party since it would include volunteer firefighters and there would be retrospective compensation for retired firefighters (Bastians, 2012).

2.5 Conclusion

The corollary of the dangerous and physically demanding nature of the duties of firefighters is that there are higher mortality rates and elevated prevalence of adverse physical health outcomes for this cohort of workers. Research 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. Despite the fact that it is difficult to establish causal links between firefighting and these diseases, the link has been legally recognised through the passing of presumptive legislation in several jurisdictions. This recognition will become more widespread in the near future, including in some Australian states.

3 Psychological impacts of firefighting

3.1 Introduction

In the previous chapter we examined evidence that confirmed that working as a firefighter has adverse impacts on physical health. In addition to these physical health impacts, firefighters are likely to suffer adverse psychological effects from working in dangerous situations as well as attending serious road accidents and responding to medical emergencies. These may be triggered by a single traumatic incident or be cumulative in nature. Additional stressors include inherent characteristics of the job such as long periods of inactivity punctuated by periods of high activity, shiftwork, and organisational issues.

Mental health impairments in first responders exact considerable personal and public costs and are likely to negatively affect work performance, including the ability to provide optimal levels of care to trauma survivors. As Kleim and Westphal (2011: 17) note:

> Mental health impairments in first responders are associated with substantial personal and public costs and can adversely affect their service to victims and patients.

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 most stressful incidents are shown in Table 3.1.

Table 3.1 Most stressful incident 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.

This chapter examines: 1) the psychological impacts of firefighting; 2) predictors of PTSD and protective factors; and 3) strategies to prevent or reduce adverse psychological impacts. The following section outlines the major psychological effects associated with firefighting and provides a definition of acute stress disorder (ASD) and posttraumatic stress disorder (PTSD). Section 3.3 reviews the literature on the psychological impact of stress, with reference to studies involving firefighters and other emergency service workers. Section 3.4 outlines knowledge about characteristics that predict susceptibility to adverse psychological impacts and protective factors such as coping strategies and social support. Section 3.5 discusses strategies that can be utilised to prevent or minimise adverse psychological effects.

3.2 What are psychological effects

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

Definition of ASD and PTSD

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.

3.3 Literature review of psychological impacts of firefighting

This section: 1) reviews some of the literature relating to the psychological and social impacts of working as a firefighter; 2) reviews the factors associated with the development of psychological symptoms and factors that may prevent the onset of symptoms, referred to in the literature as predictors and protective factors, respectively; and 3) considers strategies that have been identified to prevent or treat symptoms.

3.3.1 PTSD, depression anxiety

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 US 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 3.2 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, 2006). Summary information of some international studies for firefighters is presented in Table 3.3

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, a number of 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 a number of 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 also 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. (21998) 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. A number of 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 3.2 Measures of psychological outcomes

Measure	Details
General Heath 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 3.3 Studies on 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: ▪ self-report greater posttraumatic symptoms ▪ Scored higher on self-reported interpersonal sensitivity, anxiety, hostility and psychoticism.

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 taken into account, 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, 1995). 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.

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 vent 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.[4] 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) undertook a study of 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.

The impact of major traumatic incidents

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 3.4 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%
Riolli 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 Riolli 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 World Trade 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' (Riolli 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 suffers 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 (McFarlane 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).

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 pretramuatic 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; and
- 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 groups; 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 in order 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 cures 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.

3.3.2 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.

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 a number of 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.

In an attempt 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 posttrauma 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.

3.3.3 Suicide

Given the psychological impact of firefighting – higher prevalence of PTSD, depression, anxiety and alcohol or drug use – there is a probability that firefighters may be more likely to commit suicide. It is difficult to determine whether there is an occupational link between firefighting and suicide due to the lack of data or the unreliability of data. Death certificates may not record occupation. Even where occupation is recorded on death certificates, they may record a later occupation even though the person was a firefighter for a substantial part of working life, or may record the occupation as retired.

In the US, suicide ideation ranges from 5 to 14 per cent and is more likely in people with depression, anxiety, conduct disorders and substance abuse (Gist et al., 2011). Those with alcohol abuse or dependence are more than three times as likely to transition from ideation to a suicide attempt, while those with anxiety disorders (including PTSD) are more than twice as likely to transition to an attempt (Gist, et al., 2011). Since firefighters have higher than average prevalence rates for PTSD, depression and anxiety, it is likely that they are more likely to commit suicide. While there are no reliable statistics on deaths of firefighters in the US, concerns have been raised regarding specific "suicide clusters" among firefighters, particularly in the United States, including Chicago, Phoenix and Philadelphia (Gist et al., 2011).

It is not possible to obtain accurate data on suicides by occupation in Australia. ABS data on suicides reveals that age standardised rates of suicide vary significantly between males and females. The age standardised rate for 2006-2010 was 16.3 deaths per 100,000 for males compared to 4.8 deaths per 100,000 for females.[5] Males accounted for 77 per cent of deaths classified as suicide in 2010 (ABS, 2012). In 2010, males aged 35-39 years, 40-44 years, and 45-54 years had death rates in excess of 27 per 100,000. For females, death rates around 7.5 deaths per 100,000 were recorded for the 25-39, 45-49 and 50-54 age group.

The ABS does not publish data on deaths (including suicides) by occupation due to issues of data quality as outlined above. The only Australian research that was located was dated and likely to be affected by similar data inaccuracies. Hassan (1992) obtained suicide data by occupation for males between 1968 and 1981 and computed average annual rates. Suicide

rates ranged from 58.2 per 100,000 for sailors to 9.1 per 100,000 for pastors and religious workers. Firefighters and police officers were grouped together and had an average annual death rate from suicide of 18.2 per 100,000. Hassan (1992) cautioned that the evidence that occupation is correlated with suicide rates should be interpreted with caution due to the methodological difficulties of obtaining suicide data by occupation.

3.3.4 The impact of organisational stressors

The impact of traumatic incidents, the cumulative impact of traumatic events and the impact of responding to disasters have been extensively studied. There has been less research 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.

In the Australian public sector context psychological distress has been linked to a number of 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 act professionally at all times 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; and
- 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.

They explain that perceptions of the adequacy of resources influences the degree to which firefighters are able to 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’ (Bacharach et al., 2008). Inadequate resources cause individuals to compensate by increasing effort which eventually results in ‘the development of distress symptoms (Bacharach et al., 2008).

In Chapter 2 we discovered the extreme stress that firefighters endure when the alarm is sounded and the heart and respiration rates skyrocket. An important study by Guthrie and Bryant (2005) attempted to ascertain the impact of this phenomenon, known as the startle response. They conducted a psychophysiological study of 84 trainee firefighters in NSW to

test the hypothesis that heightened physiological response to startle stimuli indicates a vulnerability to PTSD. Initially (time 1), they tested eye blink and skin conductance responses prior to exposure to trauma. Within 4 weeks of exposure 35 of the firefighters were retested and 36 who had not been exposed to trauma were reassessed as a control group (time 2). The researchers used regression analysis to identify the predictors of psychophysiological measures at time 2. They concluded that:

> The relationship between the time 1 and time 2 patterns of psychophysiological response to startle stimuli supports the hypothesis that pretrauma psychophysiological arousal may represent a vulnerability factor for heightened reactive posttrauma (Guthrie and Bryant, 2005: 288).

Due to the necessity of constantly being ready to respond, firefighters are said to 'become conditioned (hyper-vigilant) to changes in light intensity as a result of the emergency alarm system… The resultant hyper-vigilant response extends to off-duty time as well' (Barnes, 2000: 59) causing sleep disruptions and exacerbating fatigue.

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, in particular 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).

3.4 Predictors of adverse psychological impact 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. 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 of 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.

Riolli 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 (Riolli 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.

3.5 Strategies for preventing or treating psychological distress

The previous section established that firefighters are exposed to extreme stressors in relation to the nature of the duties they perform and these can be exacerbated by organisational aspects of their employment. This section reviews literature on primary prevention strategies to prevent the occurrence of psychological distress and secondary prevention strategies to identify people experiencing stress and address the issues before they become severe. An assessment of the various types of treatment is outside the scope of this study. Some of the treatments available include reality therapy, group therapy and behaviour modification. Kaplan et al. (2001) observe that prevention strategies appear to be more effective than

treatments for PTSD which underscores the importance of devising and implementing prevention strategies.

General OH&S 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 3.5.

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 pretty basic but really 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 actually 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).

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.

Table 3.5 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*.

Warning signs of psychological problems may come in a variety of forms (Comcare, 2008; ACPMH, 2007). 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, 2007). 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, 2007).

Various types of interventions and supports may be made available for people suffering from or at risk of developing psychological problems as a result 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 MFB and CFA support programs were outlined in Chapter 1.

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 (Harris et al., 2002: 226).

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) 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-o-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.

3.6 Summary and Conclusion

Adverse psychological effects of working as a firefighter emanate from working in situations where physical safety is threatened or attending traumatic incidents such as EMR or motor vehicle calls, as well as inherent characteristics of the job, such as long periods of inactivity followed by periods of high activity (calm to chaos), working shiftwork and organisational issues, including the adequacy of resources and the degree of management support.

A number of incidents have been identified as causing higher levels of stress in firefighters including: 1) rare incidents such as major disasters and terrorist events; and 2) incidents that firefighters deal with in the normal course of their duties such as witnessing the death or injury of co-workers or patients, sustaining a serious injury, being exposed to hazardous substances, attending multiple fatalities or incidents involving infants and young children.

Much of the research on the psychological impact of firefighting has concentrated on estimating prevalence rates for PTSD, depression and other psychological illness. Prevalence rates have varied substantially depending on the specific group of firefighters studies and the measures used to determine prevalence levels. Estimates for firefighters range from 6.5 per cent to 37 per cent, and are generally, but not always, estimated to exceed prevalence levels in the general population (these estimates also vary considerably).

In the literature it is common to find comorbidity of one or more psychological illnesses such as PTSD, depression, anxiety or substance abuse, with estimates of 20 per cent PTSD and up to 40 per cent for alcohol abuse.. A study of US firefighters over a two year period found comorbidity of PTSD and alcohol abuse; PTSD was 26.5 per cent and alcohol abuse was 36.2 per cent at the base period. The rates decreased over the two year period to 22.2 per cent for PTSD and 29.7 per cent for alcohol abuse.

Some studies reviewed in this report that have estimated PTSD prevalence for firefighters after specific disasters. 13 per cent of Volunteer firefighters at the site of the Oklahoma City bombing were estimated to have PTSD (North et al., 2002). A number of studies in the aftermath of the WTC estimated the impact on firefighters. For example, Perrin et al. (2007) found that 12.2 per cent of firefighters had PTSD and Corrigan et al. (2009) found a prevalence rate of 12 per cent. A study of volunteer firefighters after the 1983 bushfires in South Australia indicated PTSD prevalence of around 22 per cent.

Other studies have concentrated on specific groups of firefighters. In the US Del Ben et al. (2006) estimated PTSD prevalence at 17-22 per cent while Corneil et al. (1999) found that 22 per cent of US and 17 per cent of Canadian firefighters had PTSD. A study of German firefighters estimated the prevalence PTSD at 18.2 per cent, while 27 per cent had a mental illness (Wagner et al., 1998). Prevalence of PTSD in the UK was estimated to be 6.5 per cent (Haslam and Mallon, 2003).

Another possible outcome of occupational stress, given the psychological impact of firefighting – higher prevalence of PTSD, depression, anxiety and alcohol or drug use – is that firefighters may be more likely to commit suicide. It is difficult to determine whether there is an occupational link between firefighting and suicide due to the lack of data or the unreliability of data.

Extensive empirical research has provided insights into the predictors of psychological distress: younger age; single; previous psychological problems; feeling unsafe; being injured; lower feelings of self-worth; lower levels of social support; longer job experience; attending a greater number of traumatic incidents; and lack of control.

A number of protective factors have been identified that prevent reduce the likelihood of psychological distress. These generally belong to coping strategies and social support. Common coping strategies for firefighters include talking to workmates, camaraderie and black humour. Social support operates 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. Research has also found that there are limits to protective factors when firefighters are exposed to extreme stressors.

Knowledge of predictive and protective factors has enabled them to be utilised in OH&S models that identify and address risks. While preventing adverse impacts is the overriding objective of these plans, in the case of firefighters there are risks that cannot be eliminated. It is important to train staff to recognise the signs of psychological problems and have effective strategies in place to provide support for affected staff.

The CISM model consists of eight core elements and is widely utilised. The elements 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.

4 Focus groups of Victorian firefighters

4.1 Introduction

The final component of the research consisted of three focus groups conducted with professional firefighters from both the MFB and the CFA. The focus groups were conducted in January 2013, with one conducted by telephone conference. Participants were selected on the basis of extensive experience and knowledge of fire services in Victoria and were recruited by the UFU.

The focus groups examined the following topics:

- Major changes in the fire services in recent decades
- The role of firefighters compared to other emergency services personnel
- Major stressors for firefighters
- Supports available for firefighters to deal with job-related stress and how well they work

Participants who attended the first two focus groups were asked to complete basic demographic and employment details. They were also asked to consider specific types of incidents and indicate whether they though those incidents were stressful and to rank the ten most stressful incidents.

Participants gave informed consent for participation in the focus groups. They were given a participant information sheet which outlined the purpose and content of the research and advised them that their participation was entirely voluntary and that their contributions would not be identifiable in reports of the focus groups. They were also advised that they would withdraw from the research at any stage. All participants agreed to participate and signed a consent form.

4.2 Demographic characteristics of participants

In total there were 15 participants who were all professional male firefighters.[6] The demographic details are summarised in Table 4.1. The fact that 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; 45.5 per cent were in the 40-54 age group and a further 36.4 per cent were aged 55 years or over. The majority were married or partnered (81.8 per cent) and either had a Year 12 education (36.4 per cent) or a diploma (27.3 per cent). 73.3 per cent of participants were employed by the MFB and 26.7 per cent by the CFA. Almost 82 per cent had more than 20 years of service, while less than 10 per cent had worked in the MFB or the CFA for: 1) less than five years; and, 2) between 5 and 10 years.

Table 4.1 Demographic characteristics of focus group participants

Characteristic	Categories	%
Gender	Male	100.0
	Female	0.0
Age Group	Under 25	0.0
	25-39	18.1
	40-54	45.5
	55+	36.4
Marital status	Married/partnered	81.8
	Not married/partnered	18.2
Highest level of education	Less than Year 12	18.2
	Year 12	36.4
	Certificate	0.0
	Diploma	27.3
	Degree	9.1
	Post-Graduate degree or diploma	9.1
Employment status	Employed full-time	90.9
	Not currently employed	9.1
Employer	MFB	73.3
	CFA	26.7
Length of employment as a firefighter	Less than 5 years	9.1
	Between 5 and 10 years	9.1
	Between 10 and 20 years	0.0
	Over 20 years	81.8

4.3 What have been the major changes in the fire services in recent decades?

There was a consensus that the introduction of EMR was the biggest change that had occurred in the MFB over the past couple of decades. It was also expected to have a major impact in the CFA when it comes on line. As one participant explained:

> *I can safely say it's been the biggest change, the biggest shift ever to be seen in the MFB. I suspect it will be the same for CFA and it still remains the biggest thing all those years on* [in the MFB] *(Group 1).*

The other major factor for the MFB was the suspension of recruit courses for a period of around 10 years after the Kennett Government came to power. Participants indicated that the lack of recruit courses resulted in firefighters having to work more overtime. It also resulted in the ageing of the workforce, with the average age of MFB firefighters said to be around 49 years. One participant commented:

> *When I joined the fire brigade there used to be the old guy sitting in the front next to the driver and he was the officer and now the old blokes are in the back as well (Group 2).*

CFA participants singled out the deterioration in the numbers and reliability of volunteers as the single most notable change for the organisation. This phenomenon has not been unique to Victoria. The decline in the number of volunteers in Australia over recent decades is attributable to a number of factors, particularly economic restructuring from the late 1970s that included significant changes in industry structure and employment conditions – the rise in part-time and casual employment, increased precariousness of job tenure and the like (Birch, 2011). In addition there has been a continuing decline in rural areas accompanied by population ageing due to farm consolidation, a decline in birth rates and in-migration, while younger cohorts have increasingly migrated to urban areas to take advantage of higher education and employment opportunities. Moreover, younger adults are less likely to volunteer due to the pressure of work and family commitments. Those who do voluntary work are more likely to be involved with activities related to their children (sport or school activities) rather than firefighting.

Extensive research conducted by the Bushfire CRC established that there are common issues identified by fire services in Australia in regard to the number of volunteers:

- The number of volunteers has declined over the past few decades;
- It is difficult to recruit volunteers in newly developed urban fringe communities;
- It is difficult to get adequate numbers of volunteers to respond during business hours; and
- Small rural communities are characterised by declining and ageing population.

The level of participation by volunteer firefighters is highly variable and has been identified by fire services as an ongoing issue. Many volunteers have restricted availability to respond to incidents due to work commitments or working away from the area. Workers may also be restricted due to employer's attitudes, particularly those working in casual or insecure employment. These factors have resulted in operational difficulties that will be elaborated later in this section. Indicative comments included:

> *CFA claim that it is a volunteer based organisation but the volunteer basis is completely collapsing … we know they're not going to turn out (Group 1).*
>
> *In 1996 we were doing 440 calls we now average 1800 -1900 calls. The main driver is the failing volunteer system; our support role's got much larger' (Group 1).*

Recruitment was also viewed as a major issue in the CFA. While the CFA continued to recruit staff, the level of recruitment was viewed as inadequate for the rapid expansion in the number of fire stations:

> *I call the manning regime a reactive manning policy. Whereas the CFA has pretty much constantly run recruit courses over the years but … they've been just maintenance, recruiting for retirements and resignations and that type of thing. But we've over the last 10 years we've got into a position where we're opening stations here there and everywhere and the Authority isn't or hadn't been recruiting people to man those stations (Group 2).*

Participants from both organisations raised concerns regarding the increasing business focus of fire services which was seen to conflict with the emergency services function:

> *And management now are employing people who have not come up through the ranks… when I got in all those senior people you respected because they all had been on trucks they'd all come from the floor and they talked the lingo, they walked the walk, you respected them. Today they're university trained, know nothing about firefighters,*

nothing about the culture, nothing about what we've done, where we've come from, and that doesn't work (Group 1).

One of the real stresses here is the shifting understanding of what these organisations are. They're becoming businesses not emergency services. And that's not what it's like on the ground though. On the ground it's still exactly what you're saying, they're emergency services (Group 1).

Firefighters also 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 fires:

We now take the view that any fire we go to will be dangerous… There's a lot of chemicals being transported everywhere. … You go to a house fire now, the furniture is all petrochemical based … highly toxic … it's not just the general risk but every fire we go to now we realise it is potentially dangerous to us (Group 1).

There was a consensus in the focus groups that 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, exposed firefighters to significantly greater risk than they experienced in the past.

There have been times when we've had to back away from a call because of, there's no police presence, we're generally the first appliance on scene and then you go "this is too dangerous for us". We'll back off till the police get here (Group 1).

…drug labs, siege situations … it's a lot more unstable world out there now than it was 10 years ago, 20 years ago (Group 1).

The increasing tendency for firefighters to be first in scene was attributed to cuts in police and ambulance services. In the case of ambulance services the situation was exacerbated by inadequate resources in hospitals which resulted in ambulances spending extended periods of time at hospitals so that they were not available to respond to further calls.

Similarly, firefighters expressed concern regarding reliance on utility companies to shut down gas or electricity in emergency situations. One participant noted:

It's now an hour's wait and some of that can be rather stressful while you're waiting for a gas company to cut the gas off because of a major leak in the city centre… it's all happened because of privatisation (Group 1).

4.4 How does the role of firefighters differ from that of other emergency services personnel?

When discussing their role compared to other emergency workers, firefighters highlighted the physical nature of the job, including the weight of protective clothing and equipment and stressed the increased physical burden when there are not enough firefighters on the fire ground:

> *The one big thing about firefighter roles compared to the other two services is it's such a physical job. You go from resting heartbeat to 180 beats per minute for sometimes up to half an hour… 99 per cent of the time we're [CFA] there first so three men were doing the job that should be done by 6 or 7 people… You wouldn't see a firefighter that's not carrying a niggling injury of some sort.' (Group 1)*

The physical and emotional demands of the job dictated that firefighters must be fully fit in order to be on duty since they could be a danger to themselves and the rest of the crew if *'we're not 100 per cent right physically or we're having trouble dealing with an incident from the night before'* (Group 1).

Firefighters were also required to do what they considered to be "heavy lifting" and "dirty jobs". One participant recalled removing and bagging bodies after the Kew Cottages fire, while others talked about being required to participate in washing away biological substances at accident scenes.

Being first on scene or the only responders was a prominent difference that resulted in heightened stress for firefighters, especially when they were not equipped to deal with particular situations as well as other emergency personnel. Participants stated the paramedics were able to administer pain relief to patients whereas firefighters were not:

> *Regardless of how long we're on the scene we don't have that so we've got to deal with everything that surrounds that as well and the person might be yelling at you the whole time (Group 2).*

4.5 What are the major stressors for firefighters?

Participants at the two focus groups in Melbourne were asked to indicate which incidents they considered to be stressful and to identify the ten most stressful incidents. The results are shown in Table 4.2.

All participants indicated that a serious injury to a co-worker, serious injury to a child, multiple motor vehicle and fire victims were stressful. The incidents that less respondents indicated were stressful were: Adult DOA – natural causes (54.5 per cent); and inappropriate despatch (63.6 per cent).

Table 4.2 Stressful incidents

Incident	Considered Stressful (%)
Witness duty related death of co-worker	81.8
Co-worker fire fatality (not witnessed)	90.9
Assist seriously injured friend/relative	90.9
Sudden infant death incident	81.8
Serious injury to a co-worker	100.0
Seriously injured child	100.0
Fire incident with multiple deaths	90.9
Multiple casualty motor vehicle accident	100.0
Fire incident with multiple burn victims	100.0
Render aid to dangerous psychiatric patient	90.9
CPR/full arrest	81.8
Aid mutilated adult	90.9
Treat injured patient who resembles self/spouse/child	90.9
Attempted domestic homicide victim	81.8
Sexual assault victim	81.8
Suicide	90.9
Adult stabbing victim	72.7
Death of patient after long resuscitation	81.8
Inappropriate dispatch	63.6
Attempted suicide/drug overdose	81.8
Adult DOA – natural causes	54.5
Exposure to hazardous chemicals	90.9
Experience career ending injury (self)	81.8
Third degree burn (self)	81.8
Head injury (self)	81.8
Fracture of extremity (self)	72.7
Musculoskeletal strain (self)	72.7
Other (incidents, working conditions etc)	72.7

Participants were also asked to rank the 10 most stressful incidents. The weighted scores were tallied and the incidents were then ranked by the highest total score.[7] The 10 most stressful incidents ranked by the focus group participants are shown in Table 4.3. The two most stressful incidents involve the death of a co-worker, while a fire incident with multiple fatalities was ranked the third most stressful. Infants and children featured in the other two incidents in the top five most stressful; infant deaths at number 4 and serious injury to a child at number 5. The results are very similar to the results from Beaton et al. (1998) reported in Chapter 3. The only difference is that the Victorian firefighters did not rank a career ending

injury to themselves in the top ten incidents, but did include death of a patient after a long resuscitation.

Table 4.3 The ten most stressful incidents for firefighters

Incident	Rank
Co-worker fire fatality (not witnessed)	1
Witness duty related death of co-worker	2
Fire incident with multiple deaths	3
Sudden infant death incident	4
Seriously injured child	5
Death of patient after long resuscitation	6
Assist seriously injured friend/relative	7
Serious injury to a co-worker	8
Multiple casualty motor vehicle accident	9
Exposure to hazardous chemicals	10

This section reports the major themes of the focus group discussion involving situations that cause stress to firefighters. A number of themes were identified that can be loosely classified as: 1) factors intrinsic to the nature of the work; and 2) working conditions and operating procedures.

4.5.1 EMR and motor vehicle accidents

EMR was introduced throughout the MFB in 2001 and is currently being trialled in the CFA. EMR was identified as a major stressor by all focus groups, both in dealing with particular incidents and with family and friends of the patients. There was a general consensus that EMR calls were the most stressful and a number of participants expressed the view that this was exacerbated by the act that firefighters had joined the service to fight fires and the EMR role had been "thrust upon them".

An observation by an employee who has not been directly involved in EMR, contrasts the response of firefighters to EMR and fire calls:

> *I've been there [at a fire station] when there's been a structure fire call and I've been there when there's been an EMR call and the mood and the environment of the entire shift of that entire station is absolutely poles apart, totally different. They're just about running out the door pleased that they've got a fire to go to in many respects, when there's a fire type call. When it's an EMR, they're ashen faced when they're walking out the door (Group 1).*

A firefighter with experience in EMR concurred with this observation and elaborated on the increased stress of dealing with calls involving infants:

> *If you get a call for an infant, your stress levels and reactions are through the roof. The adrenalin is going and you're driving faster, you're taking more risks … going to a child is really stressful in EMR (Group 2).*

The toll of EMR calls was summed up by one participant:

> *It's really traumatic when you work on someone for 45 minutes, sometimes 10 minutes before the ambos turn up … families stood beside you crying … and you're just drained; I mean emotionally, physically, mentally (Group 3).*

Other participants spoke about the increased anxiety of dealing with people who are in extreme pain, the cumulative impact of the fact that very few lives are saved, of preparing deceased patients for the family to view and even *'a lot of the time we've become grief counsellors as well'* (Group 3).

The MFB Employee Assistance staff attend all EMR training sessions where they have run training modules on; distressed relatives and bystanders; cumulative stress; and, sudden unexplained death of an infant (SUDI) (Community Development and Justice Standing Committee, 2012a). Despite this, a particular concern expressed by participants in all focus groups was in relation to dealing with distressed family members at EMR and accident scenes. Firefighters stated that they struggled to know what to say to relatives. One participant noted:

> *With our EMR training we do get it a lot but it's very much just the skills of it so a huge area where we're lacking, where the paramedics for example get a lot more training, I think, is dealing with people's emotions (Group 2).*

Similar issues are encountered at accident scenes:

> *I've had family members turn up while we're trying to do our job and they're screaming and yelling …. You rely on your shift mates to support you when you get home, and your family (Group 3).*

In addition to the emotional impact of EMR calls, other participants expressed concern regarding biological exposure and physical danger. A number of specific incidents were recalled, such as 'black bile and vomit everywhere', firefighters being tested after possible exposures to HIV, dealing with people with mental illness or drug problems.

Participants also talked about the relief they felt when paramedics arrived on scene. One person stated that *'When they turn up or if they're there the pressure relief is palpable'* (Group 2). Another participant added: 'Even hearing their sirens not far away, you sort of, it's like wiping the brow a bit' (Group 2).

EMR is currently being trialled in the CFA. Staff were either apprehensive about the roll out of EMR throughout the CFA or were already finding the prospect stressful. The CFA firefighters face the added stress of potentially being on scene for longer periods of time before the paramedics arrive compared to their counterparts in the MFB. As one person commented:

> *It's even stressful for us to know that it's coming over the hill at us and we'll be forced to go through what these guys have been put through. In our situation … it's going to be a little bit different because quite often we won't be only the first responder but we'll be the only responder because the ambulances in [place name] are limited (Group 1).*

4.5.2 Exposure to hazardous substances

The exposure of firefighters to hazardous substances is an inherent characteristic of the job. Participants raised concerns over asbestos and chemicals.

Asbestos

Both services have procedures for dealing with asbestos. However, participants expressed a number of concerns, including: the lack of specific training provided; lack of effective leadership when Commanders did not always understand the proper procedure; the fact that BAs and trucks, that have also been exposed, return to the station. There was also a view

expressed that the MFB adherence to procedures was superior to the situation in the CFA. The nature of asbestos related disease meant that exposure caused stress for firefighters:

> *…there's still a fear there. There's always people come up with what if? What about the cross contamination? What about bringing it back to the station? What's it going to do to me?' (Group 2).*

Chemicals

As mentioned previously, participants perceived that the exposure to potentially dangerous chemicals has increased over time. The impact of these exposures takes a toll on individuals and their families, both in relation to adverse health impacts and the emotional strain. One participant commented that his children had asked him if he was going to get sick. The general level of anxiety resulting from exposure to hazardous chemicals was summed up this way:

> *Firefighters are suffering. I can't begin to tell you how many firefighters have died over the last 10 years of cancer related illnesses … and they're your mates you've worked side by side with. You've been to the same fires and sometimes you're waiting too … not knowing what you've got. (Group 3).*

As well as the cumulative impact of ongoing exposure, there were also specific incidents and sites where significant exposures had occurred. In addition to the physical consequences of these exposures, there was widespread anxiety over future adverse health outcomes. One such incident occurred at Coode Island in 1991:

> *People are still talking about Coode Island aren't they, because benzene there was a suspected carcinogen. Now it's a known high level carcinogen. So they're all waiting for their cancers to kick in, and some cancers are kicking in (Group 2).*

There was extensive discussion to exposure at the CFA Fiskville training facility over several decades. Participants noted that the MFB had deemed the site too dangerous for its firefighters. However, the CFA was still using the training facility. Participants were critical of the handling of the situation at Fiskville in relation to the exposure and the subsequent handling of the situation by the CFA. One participant noted the ongoing problems:

> *'CFA have been caught out adding an additive to the water to try to break down the petrochemicals in the water. They didn't notify any of their members about that. We've all been exposed to it. There's no ongoing testing of the staff at all… But everyone here, it's in the back of our minds, it's a ticking time bomb every day' (Group 1).*

4.5.3 Training

The inadequacy of training was a major focus of discussion in all focus groups. Some participants stated that additional training was required to equip firefighters with the skills to deal with families during EMR or accident calls as mentioned previously. Other major training deficiencies included: first aid training; driving courses for recruits; specialist courses; and refresher courses.

While some participants felt that the level of first aid training was adequate, many thought that there should be more extensive training to deal with EMR and rescue situations. One participant stated that the current level of first aid training and EMR training '*doesn't help you when you turn up and someone's had major trauma to various parts of their body'* (Group 3).

One participant pointed to the level of stress involved in road rescue:

> *We're 99 per cent of the time on scene first and we've got to render first aid to those casualties …We're only trained to a very basic first aid level. Every time we get a rescue call and I'm on the rescue, that's all I worry about. Am I going to be able to do my job? … The level of training we've got is not sufficient to do road rescue in my opinion (Group 1).*

A lengthy discussion in Group 3 revolved around the situation where MFB recruits were not able to complete their training and the impact it had on other firefighters;

> *Also we've got several recruit courses that are now out on shift that can't even complete their driving skills. Some have been at work for nearly two years and they can't drive. They haven't been tested yet. So it means that the blokes that are on shift already, some of them have to drive every day (Group 3).*

This was attributed to the fact that there is an insufficient number of trucks in the driving department, resulting in about 5 to 6 recruit courses or 160 firefighters who have *'no prospects of being able to drive and operate the pump which they are supposed to be after 12 months' (Group 3).*

Two focus groups expressed a major concern regarding lack of courses that are essential for developing specialist skills to operate equipment and the impact this has on the skills and experience of firefighters as well as morale:

> *They talk about the budget and cutting the budget and how it won't impact. It certainly impacts on all the firefighters that are waiting to do specialist courses because their morale is down. They've been in the job 9 years, some people waiting to do a course … and they can't get on that course. It just has a detrimental effect on the morale on the job [and] their self-worth. They're keen and they want to be able to operate and use all the equipment and right now because of the budget cuts and what's going on we're not allowing them to develop. We're not developing our firefighters like we should be. Yeah the morale's down and it's probably caused a lot of depression and things like that that we're just not thinking of (Group 3).*

> *We've got guys at [name of station] who need to learn to operate trucks, who've been sitting there waiting years, which then impacts on the rest of the crew in that 3 or 4 guys can't operate this one truck so therefore they have to always be on this other truck, the one that gets all the calls so it starts impacting on them (Group 2).*

The deterioration in training was emphasised in relation to the fact that refresher courses that had been run in the past are no longer available. One person commented 'we didn't think they were enough then but when you look back on it they were fantastic' (Group 2).

4.5.4 General organisational pressures

While the vast majority of the extant research on the emotional and psychological effects or firefighting concentrate on the impact of traumatic events or disasters much of the stress that firefighters are exposed to emanates from daily work stresses and the level of organisational support (Baker and Williams, 2001; Brough, 2004) as well as physical demands such as the impact of the rapid transformation from inactivity to maximum physical activity, and shiftwork (Barnes, 1997; Guthrie and Bryant, 2005). This section reports aspects of normal operations related to the non-critical incident aspects of the role of professional firefighters and their interaction with other services.

Manning levels and Standard Operating Procedures (SOPs)

For the CFA employees the level of manning emerged as a major issue that impacted on their performance. This was a particular concern when a three man crew attended structure fires where a person was trapped inside the building. The SOP states that firefighters are not able to enter a building alone but there is also a requirement to have an incident controller and a pump operator. For CFA crews, it was noted, that there may not be another truck for 15 or 20 minutes, or there may not be any back-up at all. In these situations firefighters are faced with an onerous decision. They can:

- Work to the SOPs and not attempt to the rescue; or
- Attempt the rescue, risk injury and the consequences of breaching the SOPs.

Either decision involves considerable stress for the firefighters, especially the officer in charge. On one hand they would have to live with the fact that they stood by and failed to assist the person trapped in the building. On the other hand, if two firefighters enter the building the third person would need to operate the pump, leaving the position of incident controller vacant. This dilemma was summed up:

> *As a fire ground commander you're tossing up what's the right thing to do by your health and safety for your crew, what's the right thing to do by the public and at the end of the day we're there to save lives, put the fires out, do all we can do and we can't do that adequately under the working conditions that the CFA are imposing on us (Group 1).*
>
> *We're only running a minimum crew in most stations of 3 in the smaller stations and once again that ... impacts on me when we get to a decent job. I've got a pump operator, a firey and myself and if it's a decent job I've got to dress those two blokes in BA and then become pump operator myself and take me away from my primary role and try and manage two or three different jobs until such time as other people get there (Group 2).*

The lack of staff also impacts on other firefighters who are required to work overtime to maintain minimum manning levels. For example, in a three man station someone is required to work overtime if a person on the next shift is absent. Participants indicated that working excessive overtime caused stress for the firefighter and the family.

The recent Inquiry into trauma in workers in disasters noted that:

> One of the issues that we have come across in our inquiry is the need for giving frontline personnel down time so that they can rest and recover. The number of career firefighters has not really grown appreciably in the last few years, and it has meant that you guys have had to do substantial amounts of overtime (Community Development and Justice Standing Committee, 2012c).

The impact of shift work and hyper-vigilance

Discussion about the impact of shiftwork on sleep patterns and health revealed that it was a significant issue for some participants. Several participants commented on finding it difficult to sleep, particularly trying to sleep during the day when they were on night shift. One person noted:

> *It's very hard to sleep, I'm more walking around a little bit like a zombie, probably a lack of sleep equivalent to point 05 (Group 1).*

Others mentioned that their sleeping difficulty related specifically to hyper-vigilance, since the readiness to respond to alarms while on-duty transfers to the off-duty environment. In short, they were waiting for the bells to go off that startle response was triggered by something:

> *You go home and you sleep at home the next night. You can't sleep because you're waiting for the bells to go off (Group 1).*
>
> *Off duty at night the slightest noise generally wakes you up. I know that if there's a flash of light outside, maybe say a street light or something, it'll just trigger that (Group 1).*

Lack of support

The perception that the fire services had changed orientation toward a business model has resulted in additional stress for firefighters. Many participants expressed the view that in the past they had been confident that management were approachable and concerned with the welfare of staff. To a large extent this confidence has evaporated over time:

> *When I joined the job I could go to my District Officer - they're called Commanders now - if I had a problem … now, I don't know, I would never talk to the higher ranks - my officer, I would - but going above him, I just wouldn't trust any of them and that puts added pressure on you inside (Group 3).*

In operational situations firefighters pointed to inconsistencies in decision-making by Commanders and the detrimental impact that had. One participant recounted a situation where they attended a fire and the Commander arranged for two more trucks to attend. However, another Commander decided that the additional trucks were not needed, without discussing the situation with the first Commander and the trucks did not arrive. The result was:

> *The guys on the fireground were saying: 'Where's the relief? Where's the relief?' and this guy is saying 'Well I've directed him to do it'…. We're the guys on the end of that little tit for tat … In the mean time we've got guys on the end of hose lines that have been in this job way longer than they should have, getting more dehydrated (Group 2).*

One comment summed up the general appraisal of lack of adequate support by management:

> *Most of my stress and anxiety goes through the way that management especially in the CFA and obviously in the MFB do not understand what we do and how we do it and I find that extremely disappointing and stressful (Group 1).*

While governments and management continually state that funding cuts do not impact on the delivery of frontline services, this was not the perception of participants. One CFA firefighter explained that the current structural gear is heavy and hot so that firefighters perspire after a short period of time *'you're starting to sweat like crazy in this gear and your hydration is a major problem'* (Group 2), even when the temperature is only 23 degrees. Management has been critical of the use of Hydro-Lite products for hydration, stating that these products should only be used when the temperature is 30 degrees or above. MFB employees stated that this was not an issue for them.

Far from having no impact on frontline services, participants recounted instances where budget cuts have already impacted, and more severe effects are expected in the future. Some examples cited included not being able to change couplings on hoses, or carry out repairs to trucks and equipment. Moreover, one participant explained that the Next Generation

Response Project had been shelved. The project was to have provided computers and turnout terminals in trucks, *'which had the potential to save many lives and a lot of property*'.

Working with volunteers and other agencies

The CFA is composed of both professional and volunteer firefighters. The primary problem identified is that volunteers don't turn out.

Response times for volunteers are necessarily longer than for career brigades that are on duty at the fire station when incidents are reported. The fact that many volunteers are not available to attend a particular incident means that, in addition to longer response times, there is also a high probability that the weight of response will be inadequate on occasions. Reliance on increasing the number of volunteer firefighters to improve coverage may result in a false sense of security. Regardless of how many volunteers there are, deployment depends on availability at the time incidents occur.

Focus group participants discussed extensive problems with the volunteer component of the CFA at a time when *'The country area of Victoria is in massive growth mode at the same time as the volunteer response is deteriorating'* (Group 1). One CFA firefighter outlined difficulties at a station where there were nine volunteers on the books. Of these three lived approximately 30 kilometres away, none were trained in BA, and only one was qualified to drive the water tanker.

The current method of recording responses by the CFA was seen to be misleading and participants reported feeling undervalued. The situation was explained as follows. Volunteer brigades have a certain amount of time to respond to a call. If they do not respond within that time frame the call goes to the next brigade, and so on. In a situation where more than one brigade is called the response data is only recorded for the brigade that responds. Thus, the fact that one of more brigades did not respond at all is not shown in the data. Participants felt that this procedure masks the fact that some volunteer brigades have not responded and therefore indicates that performance is better than it actually is. Similarly career brigades answer the majority of calls and meet their turnout times so the aggregate data disguises the slower turnout times for voluntary brigades. Participants also stated that the CFA can also change the classification of a volunteer brigade so that they are no longer measured on response times. Moreover, a response is recorded regardless of the type of vehicle or strength of response. This means that if one person in a car responds to a structure fire they are shown as having responded even though they are not able to fight the fire.

Numerous examples were given of situations where volunteer firefighters or other services were in charge of incidents when professional firefighters were on scene. These situations were assessed as very stressful for the professional firefighters, especially when the volunteers were inexperienced and inefficient. One situation involved a SES crew arriving at the scene of a motor vehicle accident with a person trapped inside the vehicle. The ambulance service had asked the firefighters to get the person out of the car and they were in the process of doing that when the SES turned up and insisted that the firefighters remove their equipment. The firefighter expressed extreme frustration that the rescue was delayed and this was compounded when the SES:

> *…couldn't get their gear to work and we're watching these clowns trying to get their gear to work and it was a joke. It is so frustrating (Group 1).*

Comments such as this indicate high levels of dissatisfaction with current procedures, resulting in elevated levels of stress which may result in psychological distress as explained in the research findings of Baker and Williams (2001) in relation to the UK firefighters (reported in Chapter 3).

Participants suggested that there should be one fire service for Victoria, stressing that the current situation of different standards of cover and the incompatibility of equipment are major problems:

> *We should have one service that is for professional firefighters across the state and then we'd have the same commonality and the same support and we'd all just be able to work together (Group 1).*

This suggestion mirrors that of Hayward and Groenhart's (2010) submission to the Bushfire Royal Commission. They pointed to efficiency and effectiveness benefits of having one SOFC and overcoming 'difficulties arising from the use of different core technologies, such as fire hose couplings, radio communications, appliances and pumps' (Hayward and Groenhart, 2010:14).

4.6 The psychological impact of stress for Victorian firefighters

Themes emerging from discussions about the psychological impacts of working as firefighters in Victoria confirmed the findings from the literature that was reviewed in the previous chapter. These themes included: the impact of the general lack of time to debrief after incidents; the impact of particular incidents and cumulative stress on individuals; the negative psychological impacts of EMR and concerns about future impacts, especially in the CFA; lack of support from management; drinking to cope; and the impact on families.

One participant described the impact of having to maintain professionalism at all times even when there is not sufficient time to debrief before going to another job:

> *'You may be first on scene at something that's rather traumatic for everyone involved and you know none of those people will be going back to work that day or doing anything else … But you know we're straight back in the truck after dealing with all that and we might go to the same thing again in half an hour's time … I think there's also the stress of just maintaining that professionalism that the public expect and that you want to provide as well' (Group 2).*

A number of participants related stories of the impact of a single traumatic event on themselves or co-workers. In one case a participant raised the situation where an experienced rescue worker was confronted with an incident where the victim reminded him of a close family member, triggering a stress response. He commented:

> *I have worked with a bloke who went to a car accident and he came back shaking and he never normally. He said "the woman we pulled out of the car looked just like my sister"… He was a rescue operator of big experience (Group 2).*

Another person related his experience of reacting to a particular incident and the ongoing effect that it had on him:

> *I've been to a couple of them [suicides] and I remember … one in particular was on father's day and we had to get the person down over the railway bridge and … every father's day it comes back. It's the first thing I think about in the morning and I get emotional about it (Group 1).*

However, the majority view was that PTSD was much more likely to result from cumulative stress. Participants were concerned that the intensity and level of exposure increased over time and left all firefighters vulnerable to PTSD as their career progressed and even after retirement, when they lost the support of co-workers.

> *That's going to be the big issue that comes back and bites people. Constant exposure to the same thing over and over and over again without the relevant and required preparation to deal with those things is what's going to come back and be a real issue in the future (Group 1).*

> *Cumulative stress that then leads on the PTSD … people go on leave and when people retire and they lose that second family … they lose that support, they lose camaraderie and they're dealing with all this stuff that they've bottled down or put a cork on for all these years … That's when PTSD comes to bite people (Group 1).*

Some participants expressed a belief that many firefighters suffered from undiagnosed PTSD or depression which impacted on work performance as well as the individual's health. One person related a situation, which he attributed to cumulative stress, where a firefighter became aggressive, his work performance deteriorated and he subsequently left the job. A general description of the consequences of PTSD and depression was explained by another participant:

> *Look I think it's a lot bigger problem than what we actually acknowledge … We've got a lot of guys that really don't know they've got it … Their personalities change in the sense where they become withdrawn … Where they've been very active people inside and outside the job, they're not active they just sit around an just go through the motions and that's depression (Group 3).*

This view was supported by evidence to the evidence by the MFB Employee Assistance Coordinator to a Western Australian parliamentary inquiry. He speculated on the low number of PTSD compensation claims (Community Development and Justice Standing Committee, 2012a: 9):

> We might have 0.5 of a per cent of the cases that we know of, which tells me that there are probably a few people out there who are ticking time bombs, unfortunately … It is either because our firefighters are really resilient and they are coping really great or there are some people out there that do have issues and we do not know about them.

The subject of firefighters committing suicide was raised in one group. One participant indicated that he was concerned about the link with the occupation and the prevalence of suicide, stating:

> *I can name 9 blokes who, for whatever reason, have killed themselves. And there would be names of people I don't know… I think it's like our job is a filing cabinet and one day the file is full (Group 3).*

Another person concurred:

> *I can't say that firefighting is what caused them, but I would imagine that shiftwork and being a firefighter and seeing and doing what we do has in some way contributed to that unfortunate circumstances where they felt they had to end their life (Group 3)*

Just as the use of alcohol to cope has been a feature of international research into the coping strategies of firefighters, focus group participants indicated that alcohol was used to relieve stress:

> *The build-up of stress … the way you get over that bad job is to go to the pub after work and have a couple of beers with your mates and talk about it…. After that session, I feel fine until the next morning when the alcohol's worn off and you still realise what you've seen and what you've just been part of (Group 3).*

The major impact of people seeking assistance to cope with the stress of the job after the introduction of EMR in the MFB was discussed at length. A participant who was in the peer support program at the time explained the major increase in workload for the program which they monitored:

> *... for 12 months and the callout rate went from around an average of 7 a week to between 7 and 12 a day. And it was all based around EMR and it still remains that way today (Group 1).*

The adverse impact of firefighting on family life was a feature of the discussion. Participants spoke about missing family events such as birthdays, Easter and Christmas as well as missing children's sporting and school events on a regular basis. Some also noted that when they had time off they were frequently exhausted. The fact that firefighters work shiftwork was seen as an added pressure on families.

In addition to these ongoing conflicts in the family and work roles, there were larger concerns about the impact of the job on the family. We noted previously the concerns of children for their father's health due to exposure to hazardous chemicals. Some participants recounted specific instances where their family had expressed fears relating to dangerous jobs. One participant who was involved in the Black Saturday fires explained the reaction of his partner:

> *When the Black Saturday fires were on we set up a taskforce and I went up there. She was quite stressed out with that. I was more than comfortable doing it but I know that affected her quite a bit (Group 2).*

Despite the fact that both the MFB and CFA have specific programs designed to minimise or prevent adverse psychological effects, a major theme of the focus groups was the perception that there was inadequate support from management, particularly for CFA members. One participant elaborated concerns for individuals who have PTSD and also for firefighters who may succumb in the future:

> *We've got a couple of people in the CFA that have been diagnosed with posttraumatic stress syndrome. The CFA just feel that that's a person's weakness. They just think that's a weak minded person that couldn't deal with what everyone else deals with. They just throw them on the scrapheap… They don't recognise that it's a syndrome, they don't recognise it's a problem. They don't recognise that there's a whole heap of older blokes walking around there at the moment that [it] could be the next job that gets to them, that pushes them over the edge (Group 1).*

This perception of lack of support from management presents a significant problem for the successful implementation of the welfare programs established to deal with psychological stress, as we will discover in the next section.

4.7 What supports are available for firefighters to deal with job-related stress and how well do they work?

This section outlines the discussion around formal and informal support mechanisms. Discussion of formal supports was restricted to the peer support program of both organisations. Informal supports included talking to co-workers at the station or in social settings and talking family or friends. As detailed in Chapter 1, both fire services have employee supports in place.

One of the major obstacles to the success of support and welfare programs identified in the international literature is the reluctance of firefighters to use the programs available. Reasons

provided for firefighters not being prepared to use programs included: 1) the macho nature of the job and the "rescue mindset" of concentrating on helping others; 2) a preference for informal mechanisms such as talking to shift-mates; 3) reluctance to expose any weaknesses to fellow workers or management; and 4) lack of confidence in the CFA program.

Peer Support

The discussion in the focus groups revealed a dichotomy in participant's appraisals of existing peer support programs. In the MFB the peer support program was viewed in a positive light while CFA members were critical of their program. The MFB program was much more likely to be used, was extensively advertised within the service and was viewed positively by participants. Positive comments included:

> *The MFB through the peer network have a wonderful both formal and informal process but it's always under attack from management … and this really impacts on firefighters a lot (Group 3).*
>
> *The MFB is pretty proactive really in peer support and it's offered to you quite regularly if you've been through a stressful situation (Group 2).*

However, some fears were expressed in relation to the future of the program.

In contrast, the CFA program was viewed as inferior by one member who had worked with both organisations:

> *Having seen both sides of the services, CFA and MFB, CFA's peer support is absolutely woeful, totally inadequate (Group 1).*

A major criticism of the CFA program was the selection of the peer support personnel who are predominantly volunteers and therefore perceived as inappropriate for assisting professional firefighters due to their lack of experience on the job. The following comments summed up this view:

> *At the moment most of our peer support people are volunteers … being assessed if you like or counselled by a volunteer we don't believe we're getting the right level of service in that area … we probably take the stance that we want people that we know are trained people in our field, that are working in our area in a professional sense (Group 2).*
>
> *We do have some staff that do it but they're the most inappropriate people for undertaking that sort of duty, or volunteers do it. Now there's no career person who's going to sit there and have a volunteer that turns out 20 times a year come and sit down with them and then start to debrief them over an incident. It just doesn't, the whole system just doesn't work. It's totally inappropriate (Group 1.)*

These comments provide a vastly different perspective to the official CFA view that the peer support program was working well. 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 Organisational Wellbeing commented:

> Over the last 10 years we have put some pretty significant effort and resources into upskilling the peer support program because I think it is really critical to the level of service that people get generally from the broader package of welfare services. If your peer support people are not skilled and qualified, people will not get access to the other services if they need them, and they will not necessarily be able to manage events that

would appropriately require just some basic social support (Community Development and Justice Standing Committee, 2012b: 3).

Having what the organisation views as appropriately skilled peer support personnel cannot translate into referral for professional services if staff are unwilling to use the peer support program.

In line with the research findings reported in Chapter 3, all groups discussed a more general reluctance to use the program due to perceptions that firefighters should be tough enough to cope, due to fears that seeking help would indicate weakness within the group, or would provide management with something to hold over staff. Some indicative comments were:

> *It's expected as a firefighter you're a rock and nothing can break through that shell and you're there to help other people (Group 1).*
>
> *People don't want to give away weaknesses … I don't want someone else to think that I'm the weak link in the truck (Group 2).*
>
> *You don't want management to know….once they realise that you have some issues there, you're going to get pushed aside (Group 1).*
>
> *They're a bit loath to let management know that they're going through something because it might impact on them. The fear is it might impact on them down the road (Group 2).*

A number of suggestions for improving the effectiveness of the programs revolved around the necessity for education and training so that using peer support and other programs was "acceptable". An indicative comment in relation to the CFA was:

> *I think there's got to be a lot more education in making it acceptable; that you can go and talk to someone because it's still a barrier for a lot of people and it's a sign of weakness and management look at you a little bit funny if you say "I'm struggling here." People won't do it until it's got to the stage where they have to because they're crashing…I think there's got to be a lot of education and a change of views (Group 1).*

Informal supports

The literature points to the importance of informal support such as talking to workmates, family and friend as well as the use of black humour. Participants identified workmates as the primary informal support mechanism. In particular, they expressed the importance of informal chats at the station after a stressful job, drinks after work and the use of black humour. Comments indicating the importance of support from co-workers included:

> *You'd come back from a late night dingle and you'd have colleagues that would be sitting there waiting for you at the station level to have a chat and talk about it. So I think predominantly we've always looked after ourselves at a station level rather than go externally (Group 3).*
>
> *You all go back to the station, sit around, have a cup of tea and some biscuits and that to me was like an informal peer support … some people come out a bit in that and that's their release. I find, me personally, that's enough for me usually (Group 2).*
>
> *It's amongst our own group you know your own shift you sit down with them after a job and a lot of the debriefing and a lot of the talking and diffusing happens in that first 10 minutes back at the station when you sit down at the mess room table and have a chat about the job (Group 1).*

The extensive use of black humour that is a common feature of emergency services throughout the world was summed up as follows:

> *You might joke about something but you're not joking to disrespect someone who's just been hurt or lost their life or whatever … It's a coping mechanism, I guess, and I think it's fairly common in the fire brigade (Group 2).*

Participants expressed mixed feelings about confiding in family. On one hand they indicated that their partners rarely asked about work, which they felt prevented them from confiding. On the other hand, they were reluctant to burden their families with job stresses. This was summed up by one participant:

> *I think it's a combination of all those things; you don't want to drown them in it, and yeah, sometimes if you really had something on your mind, I wouldn't mind being asked (Group 2).*

One final aspect of the peer support program that was discussed in the focus groups was the impact of providing support to peers, either in a formal capacity, through the peer support program, or informally. Those involved in the peer support program indicated that they had been affected by the demands of the role:

> *Probably it does drag you down a little bit, especially when they're having trouble and you can only try and help them. You can't do it for them and your hands are tied a lot (Group 3).*

Firefighters who were not involved in peer support also related how providing informal support to co-workers with problems had impacted on them. One person commented:

> *Yes it does affect you a little bit, because I've actually had phone calls at home … so even off duty you're a little bit worried about his welfare … it does affect you, absolutely (Group 2).*

4.8 Summary and Conclusion

The focus group participants confirmed that many of the issues from the international literature are also issues in Victoria. The most stressful aspects of working as a firefighter included: the stress associated with of the nature of EMR work and dealing with distressed family members; exposure to hazardous substances such as asbestos and chemicals; lack of adequate training to perform at optimal levels of efficiency. There were also a range of operational pressures that were considered to be major sources of work stress. These can be viewed as either:

- inherent characteristics of the job, such as shiftwork and the instantaneous transformation from calm to chaos when the alarm sounds; or
- organisational: insufficient staffing and resources that will be further exacerbated by recent budget cuts; inadequate turnout of volunteers; lack of consistency in decision-making by Commanders; lack of support from management; and problems with interoperability.

The psychological impact of stress was attributed both to the impact of particular incidents and cumulative stress on individuals. There was a perception that cumulative stress left all firefighters vulnerable to PTSD as their career progressed, and even after retirement, when they lost the support of co-workers. Some participants expressed a belief that there were firefighters suffering from undiagnosed PTSD or depression which impacted on work performance as well as the individual's health.

One participant indicated that several firefighters had committed suicide and raised concerns about the link between suicide and firefighting. Just as the use of alcohol to cope has been a feature of international research into the coping strategies of firefighters, focus group participants indicated that alcohol was used to relieve stress.

The adverse impact of firefighting on family life was a feature of the discussion. Participants spoke about missing family events such as birthdays, Easter and Christmas as well as children's sporting and school events. The fact that firefighters work shiftwork was seen as an added pressure on families. Some participants recounted specific instances where their family had expressed fears relating to dangerous jobs.

Despite the fact that both the MFB and CFA have specific programs designed to minimise or prevent adverse psychological effects, a major theme of the focus groups was the perception there was a reluctance to use these programs. Possible reasons including: 1) the macho nature of the job and the "rescue mindset" of concentrating on helping others; 2) a preference for informal mechanisms such as talking to shift-mates; 3) reluctance to expose any weaknesses to fellow workers or management; and 4) a lack of confidence in the CFA program.

The discussion in the focus groups revealed a dichotomy in appraisals of peer support programs. In the MFB the peer support program was viewed in a positive light. A major criticism of the CFA program was the selection of the peer support personnel who are predominantly volunteers and therefore viewed as inappropriate for assisting professional firefighters due to their lack of experience on the job. The perception of lack of support from management and the lack of trust in management present significant problems for the successful implementation of the welfare programs established to deal with psychological stress.

Participants identified workmates as the primary informal support mechanism. In particular, they expressed the importance of informal chats at the station after a stressful job, drinks after work and the use of black humour. There were mixed feelings about confiding in family. Although firefighters would appreciate support they were reluctant to burden family members with job stresses.

Participants suggested that there should be one fire service for Victoria, stressing that the current situation of different standards of cover and the incompatibility of equipment are major problems.

5 The impact of physical and psychological illness on work attendance

5.1 Introduction

Workplace injuries are accompanied by substantial economic and social costs. Estimates of economic costs vary significantly. According to Safe Work Australia (2012) the total economic cost of work-related injuries in 2008-09 was $60.6 billion or 4.8 per cent of GDP. These costs included direct costs and indirect costs such as lost productivity, lost income and quality of life. The burden of these economic costs was estimated to fall predominantly on the workers, with loss of income and non-compensable medical expenses accounting for around 74 per cent of total costs. Employers provided around 5 per cent of total costs and the remainder of the burden was shouldered by the community in the form of welfare payments, health expenses and loss of potential output and revenue (Safe Work Australia (2012).

Australian estimates of the cost of unplanned absences (sick leave, family leave and compensation) vary significantly. Absenteeism has been estimated to cost Australian businesses up to $30 billion per annum (Murphy et al., 2012). In contrast, PriceWaterhouseCoopers (PWC, 2010) estimated that the costs of absenteeism were around $7 billion per annum but were significantly lower that the costs of presenteeism (not fully functioning at work due to medical conditions), which they estimated to be around $26 billion in 2005-06. The AIHW (2010) estimated that depression was responsible for 29 per cent of costs associated with absenteeism due to chronic illness.

The evidence presented in this report suggests that that the physically and emotionally demanding role of firefighters, combined with the impact of shiftwork, should result in higher physical and psychological injuries than for the general workforce. This chapter examines the evidence of workplace injuries and unplanned absences in Australia, concentrating on the situation of firefighters in Victoria.

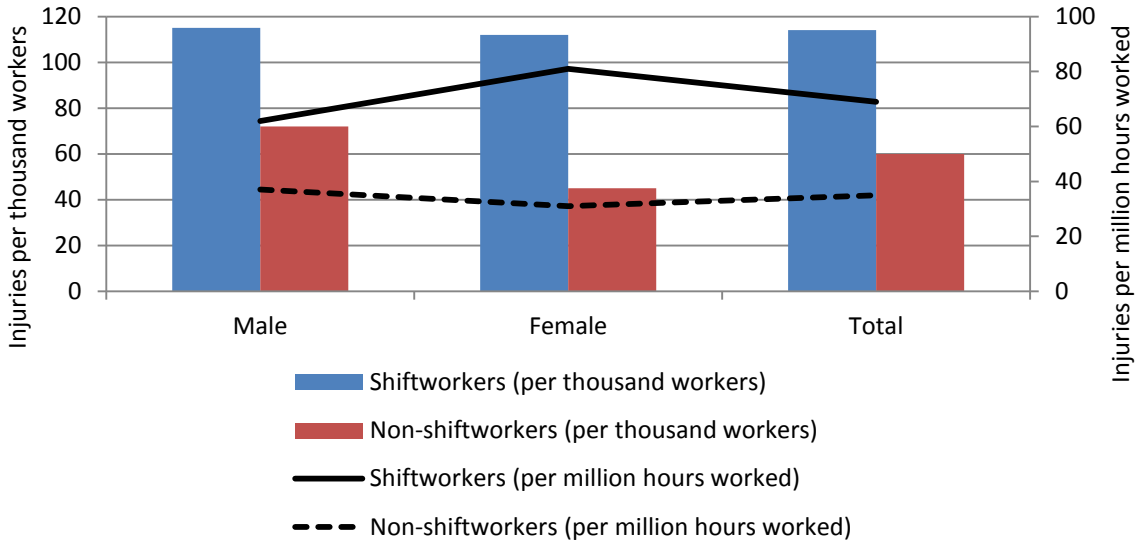
5.2 Workplace injuries

In 2009-10, 6.5 per cent of Australian employees and 7.4 per cent of male employees sustained a work-related injury (ABS, 2011). In Victoria, 52.9 males/52.1 persons were injured per 1,000 workers.

5.2.1 Work injuries for shiftworkers

Shift workers have higher injury rates. While only 16 per cent of employed persons worked shift work in 2009-10, 28 per cent of the 640,700 people who sustained a workplace injury were working shiftwork (ABS, 2011). A study of the impact of shiftwork on workplace injuries by Safe Work Australia (2009) shows that, in 2005-06, the injury rate for shiftworkers was around twice the rate for non-shiftworkers (Figure 5.1). 114 shiftworkers per thousand workers were injured compared to only 60 non-shiftworkers. Using an hours-based method, 69 shiftworkers were injured per million hours worked while only 35 non-shiftworkers were injured per million hours worked.

Figure 5.1 Work-related injuries, shiftworkers and non-shiftworkers, 2005-06



Source: Safe Work Australia, 2009

5.3 Workers' compensation

Data on workers' compensation claims by industry is published by Safe Work Australia. Table 5.1 shows the industry groups with the highest frequency rate of accepted workers' compensation claims with one week or more time lost excluding travel to and from work. Frequency is calculated as a rate per million hours worked. The average refers to the annual average frequency rate between 2000-01 and 2010-11.

Table 5.1 Workers Compensation: National frequency rates by industry

	Industry division	Industry group	Average
1	Manufacturing	Sheet metal product manufacturing	41.8
2	Manufacturing	Meat and meat product manufacturing	31.7
3	Manufacturing	Prefabricated building manufacturing	28.8
4	Agriculture, forestry and fishing	Other livestock farming	26.4
5	Manufacturing	Other manufacturing n.e.c.	25.1
6	Mining	Other mining services	24.1
7	Transport and storage	Services to road transport	23.4
8	Manufacturing	Structural metal product manufacturing	23.3
9	Manufacturing	Leather and leather product manufacturing	22.4
10	Transport and storage	Storage	20.4
11	Manufacturing	Textile fibre, yarn and woven fabric manufacturing	20.3
12	Agriculture, forestry and fishing	Aquaculture	20.3
13	Transport and storage	Services to water transport	19.9
14	Agriculture, forestry and fishing	Services to agriculture	19.8
15	Personal and other services	Public order and safety services	19.7
16	Manufacturing	Cement, lime, plaster and concrete product manufacturing	19.6
17	Manufacturing	Fabricated metal product manufacturing	19.1
18	Construction	Non-building construction	18.6
19	Manufacturing	Other wood product manufacturing	18.5
20	Manufacturing	Petroleum and coal product manufacturing n.e.c.	18.2
	Total		8.4

Source: Safe Work Australia National Data Set for Compensation-based Statistics (NDS)

The 20 industry groups with the highest frequency of compensation claims are well above the Australian average of 8.4 claims per million working hours. High rates of manual work are a feature of these industries that include: manufacturing; agriculture, forestry and fishing; mining; transport and storage; and personal and other services. The highest frequency rates are in manufacturing industries such as: sheet metal products (41.8); meat and meat production (31.7) and prefabricated building manufacturing (28.8).

In the Australian New Zealand Standard Industrial Classification (ANZSIC) 1993 which is used in these data, firefighters are included in the personal and other services industry division and the public order and safety services industry group that also includes police, correctional and detention services and private investigation and security services. This industry group has a frequency of compensation claims (19.7) that is more than twice the national average of 8.4. It is not possible to determine the exact frequency for firefighters since the data does not provide a breakdown between different workers in this group. Since these data are aggregated to the national level it is not possible to compare differences by State/Territory.

5.3.1 Workers' compensation in Victoria

WorkSafe Victoria (2012) provides statistics on workers' compensation claims based on standardised claims that exclude:

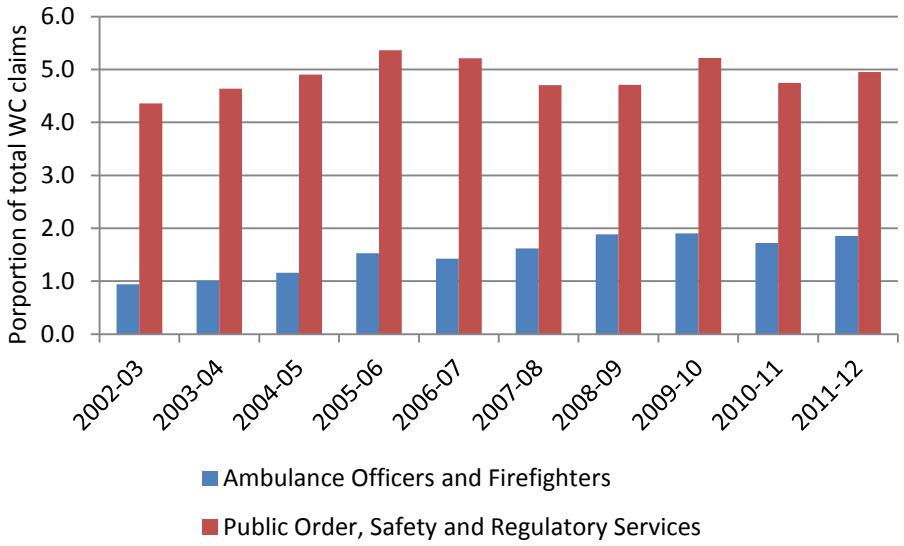
- Journey to and from work claims; and
- Non-fatal claims up to 10 days compensation and payments below the medical and like threshold ($612 in 2011-12).

Under the ANZSIC 2006 industry classification used by WorkSafe Victoria the Public Order, Safety and Regulatory Services Industry Subdivision includes:

- Police Services;
- Investigation and Security Services;
- **Fire Protection and Other Emergency Services;**
- Correctional and Detention Services;
- Other Public order and Safety Services; and
- Regulatory Services

Over the period 2002-03 to 2011-12 these groups have increased their share of compensation claims in Victoria from 0.9 per cent in 2002-03 to 1.9 per cent in 2011-12. Figure 5.2 shows the proportion of workers' compensation claims in Victoria from the Public Order, Safety and Regulatory Services Subdivision between 2002-03 and 2011-12. The blue columns represent the proportion of total compensation claims by ambulance officers and firefighters. Over the period the share of claims has increased for this group; from 4.4 per cent in 2002-03 to 4.9 per cent in 2011-12. The data do not provide a further breakdown into industry groups or classes.

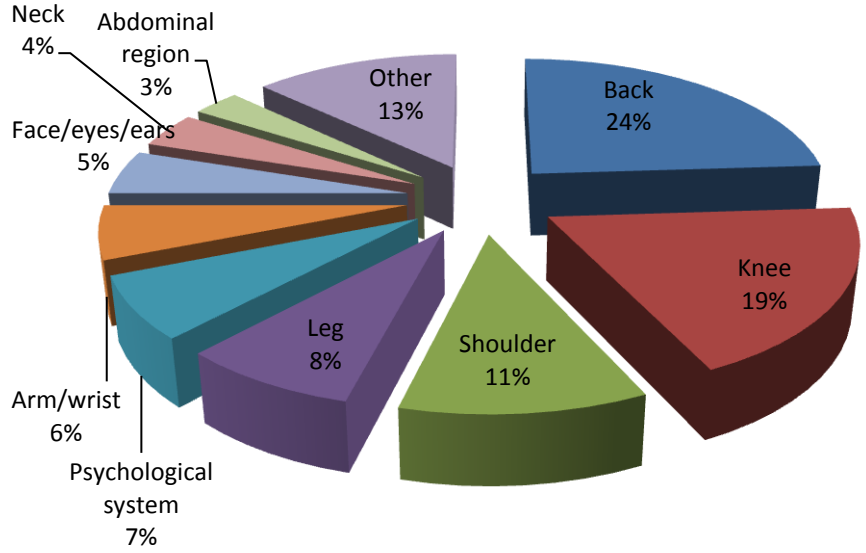
Figure 5.2 Workers' compensation claims, Public Order, Safety and Regulatory Services



Source: WorkSafe Victoria (2012) WorkSafe Victoria Statistical Summary 2011/12

WorkSafe Victoria also provides some data on workers' compensation claims for Victorian firefighters. In the five years between July 2002 and June 2007 there were 907 claims for workers' compensation from Victorian firefighters. This averages around 181 claims per annum. Figure 5.3 shows the major categories of injuries involved in claims from fire services employees for the five year period. The largest proportion of claims relate to physical injuries to the back (24 per cent), knee (19 per cent), shoulder (11 per cent) or leg (8 per cent).

Figure 5.3 Injury claims for workers in fire service in Victoria, July 2002 to June 2007



Source: WorkSafe Victoria, Injury Hotspots: Fire Services, available at: https://www4.worksafe.vic.gov.au/worksafe/hotspots/webPDF/june_2008/vwa_hotspots_fire.pdf.

In total 7 per cent of claims pertained to the psychological system which equates to around 63 claims over the five year period or approximately 13 per annum. During this period, psychological injuries accounted for approximately 9 per cent of all workers compensation claims in Victoria and this rose to 10 per cent by 2011-12 (WorkSafe Victoria, 2012). The

higher proportion of claims for psychological injuries for the Victorian workforce may be a consequence of higher rates of physical injuries for firefighters due to the dangerous nature of the work (so that psychological claims are a lower proportion of total claims).

How does the situation of Victorian firefighters compare with workers in other jurisdictions?

- In NSW, in 2008-09, mental disorders including psychological injury made up 5.9 per cent of all occupational disease claims (WorkCover, 2010).
- In Australia, in 2009-10, stress and other mental injuries accounted for around 5 per cent of total work-related injuries (ABS, 2011 Work-Related Injuries).

The proportion of workers' compensation claims for psychological injuries for Victorian firefighters (7 per cent) was higher than the national rate of work-related psychological injuries (5 per cent) and the proportion of psychological injury claims for all workers in NSW.

There are a number of possible explanations for the differences in the Australian injury data. First, the ABS data on injuries includes all injuries, not just those for which workers' compensation was received. In 2009-10, injured workers received workers' compensation for approximately 40 per cent of injuries. Another possibility is that firefighters have higher rates of stress-related psychological injuries, which would be consistent with the findings from the literature reviewed in Chapter 3.

It is important to remain cognisant of the fact that much of the psychological distress suffered by workers is likely to go undiagnosed and unreported and is therefore not compensated. For this reason it is likely that both the national ABS data and the WorkSafe Victoria data significantly understate the injury burden from psychological distress.

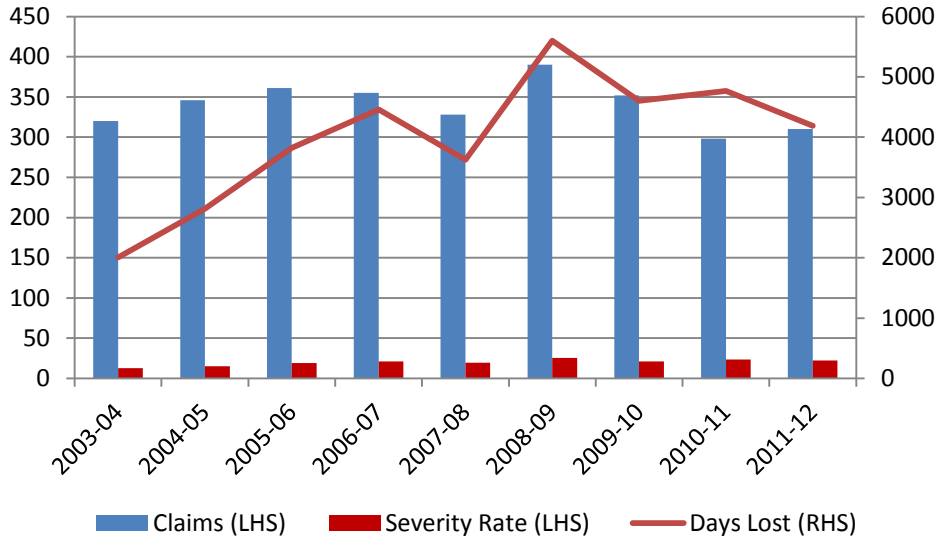
Psychological injuries result in longer absences from work. Comcare (2008) notes that employees who lodge claims for workers' compensation for psychological injuries take between two and four times as long off work as those claiming for other injuries and involve higher than average costs. This suggests that it is of added importance for employers to attempt to implement strategies to minimise psychological injuries.

5.3.2 Workers' compensation in the MFB

The MFB Annual Report 2011-12 indicated that there were 310 WorkCover claims in 2011-12 that involved a total of 4,190 lost days at an average of 22.4 days per injury (MFB, 2012a) Figure 5.4 shows the number of claims, total number of days off work and the severity rate (average number of days off work per injury) for the period 2003-04 to 2011-12. The number of claims increased from 320 in 2003-04 to reach a peak of 390 in 2008-09 before falling to 310 in 2011-12. The total number of claims could be influenced by changes in staffing levels so that an increase in the number of claims could simply reflect additional staffing resources without any change in the proportion of workers lodging a compensation claim.

The total number of days lost increased significantly during the period. In 2003-04 the number of days lost was just over 2,800. This rapidly increased to peak at almost 5,600 in 2008-09. Subsequently, there has been a marked reduction in the number of days lost, to less than 4,200 in 2011-12. The severity rate or the average number of days lost per injury has increased from 12.9 days per injury in 2003-04 to 22.4 days in 2011-12.

Figure 5.4 MFB workers' compensation data, 2003-04 to 2011-12

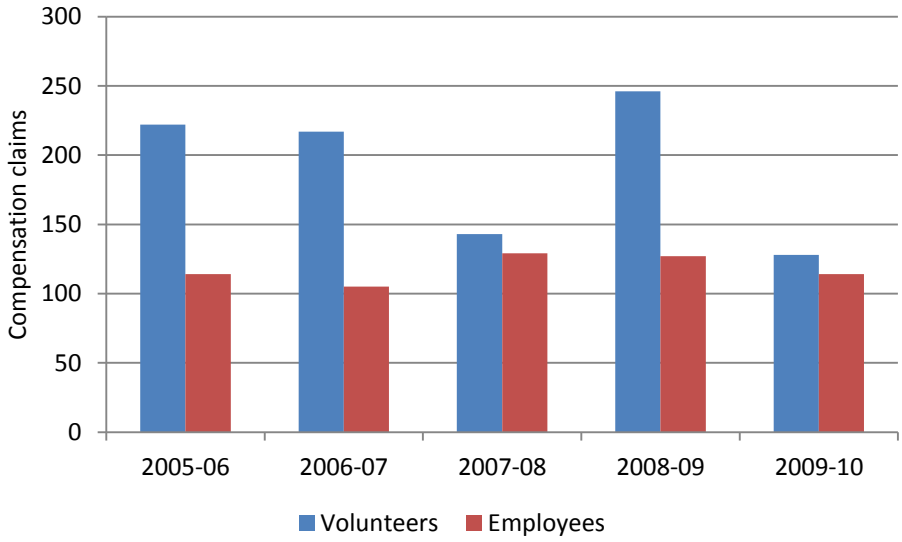


Source: MFB Annual Reports, various years.

5.3.3 CFA workers' compensation claims

Figure 5.5 shows the number of compensation claims for volunteers and employees of the CFA between 2005-06 and 2009-10. The number of claims for employees ranged between 105 in 2006-07 and 129 in 2007-08 (CFA, 2010).

Figure 5.5 CFA workers' compensation claims, 2005-06 to 2007-08



Lost time claims increased from 1.2 per 100 FTEs in 2009-10 to 1.7 per 100 FTEs in 2010-11, which the CFA attributed to claims for stress leave due to previous major incidents (CFA, 2012). The level of claims then reduced to 0.9 per 100 FTEs in 2011-12.

5.4 Total unplanned absences

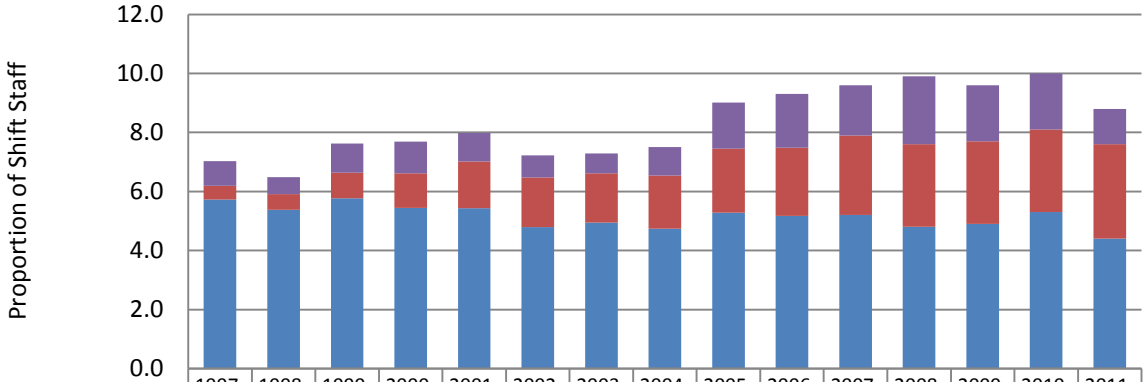
Annual surveys by Direct Health Solutions reveal that the average days lost per employee (four year trend figures) in Australia increased from 8.6 days in 2008 to 9.9 days in 2010 and then declined to 9.4 days in 2011 (Murphy et al., 2012). These data include sick leave, carers'

leave and other leave such as compassionate leave. The level of absenteeism varies between industry sectors and individual businesses. For example, the average number of lost days in the Australian Public Service was 11.1 days in 2010-11 compared to the private sector average of 7.5 days.

A comparison of absences for various public sector workers and the private sector as a whole revealed substantial differences in absences in NSW. Robertson (2012) reported that public sector workers took an annual average of 8 days of sick leave in the period 2009-2011. The cost of sick leave for the 300,000 public sector workers was estimated to be around $1 billion dollars per annum. The highest rate of sick leave occurred in Fire and Rescue NSW where workers took 82 hours of sick leave. When the data was isolated to firefighters this jumped to 120 hours. Similar rates of sick leave were recorded by other emergency services workers, such as ambulance staff who took an annual average of 78 hours sick leave.

The MFB provides data on the proportion of shift staff absences due to unplanned absences which include sick leave, family leave and compensation. This is calculated as the number of shifts absent divided by total strength and multiplied by 100. This provides a meaningful statistic since it incorporates staffing levels and therefore standardises comparisons between years.

Figure 5.6 Total unplanned absences for the MFB, 1997-98 to 2011-12



	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12
Work cover (%)	0.8	0.6	1.0	1.1	1.0	0.8	0.7	1.0	1.6	1.8	1.7	2.3	1.9	1.9	1.2
Family Leave (%)	0.5	0.5	0.9	1.2	1.6	1.7	1.7	1.8	2.2	2.3	2.7	2.8	2.8	2.8	3.2
Sick Leave (%)	5.7	5.4	5.8	5.4	5.4	4.8	4.9	4.7	5.3	5.2	5.2	4.8	4.9	5.3	4.4

Source: MFB (2012a) Annual Report 2011-12; MFB (2007) Key performance Monitoring Report April-June 2007

Figure 5.6 shows the proportion of unplanned absences in the MFB by the reason for the absence between 1997-98 and 2011-12. Over the entire period unplanned absences have increased from 7.0 per cent to 8.8 per cent. While sick leave has decreased from 5.7 per cent to 4.4 per cent this has been more than compensated for by a large increase in family leave; from 0.5 per cent to 3.2 per cent. Similarly, workers compensation leave has increased from 0.8 per cent to 1.2 per cent.

5.5 Why do firefighters have high levels of unplanned leave?

The extensive review of the international literature on the health implications of working as a firefighter, presented in Chapters 2 and 3, provides insights into the reasons for higher leave-taking by firefighters compared to other workers. The expectation of higher than average

absence is an issue common to all firefighters and is not restricted to Victoria. As noted above, NSW firefighters have the highest rates of sick leave in the NSW public sector.

The inherent nature of firefighting means that firefighters are exposed to much greater risk of injury or death than most other workers. We would expect the higher injury rate emanating from the type of work to be exacerbated by the fact that firefighters are also shiftworkers, and we noted above that the injury rate for shiftworkers is around twice the rate for non-shiftworkers. The corollary of higher injury rates is more time off work in the form of workers' compensation or sick leave.

Exposure to hazardous substances has resulted in firefighters having higher rates of work-related illness such as cardiac and respiratory diseases and cancer. Compared to other workers, employees with these types of illnesses require significantly more time off work to manage the symptoms and receive medical treatment.

Moreover, the physical demands of the job dictate that firefighters must be 100 per cent fit in order to attend work. This fact was strongly emphasised in the focus groups. The MFESB (2007: 2) acknowledged that the number of absences and their duration were related to the physical fitness requirements and the ageing workforce:

> An illness which may mean that a firefighter is not fit for duty may not affect attendance in other occupations. While firefighters are fitter when they are young, they are ageing and so take longer to recover from illness or injury.

Finally, high levels of exposure to traumatic incidents and the resultant psychological impacts such as PTSD, depression and anxiety, increase the necessity to take time off work. As we discovered previously, lost time associated with claims for PTSD is between 2 and 4 times the average length of time off work due to an injury (Comcare, 2008).

Organisational issues are also an important factor in the incidence of absences. Comcare (2008: 14) reports on a study that found 'that up to 60 per cent of psychological injury claims are preventable by improving morale, supportive leadership and the work team climate.'

The findings from the focus groups, reported in Chapter 4, indicate that employees of both the MFB and CFA feel that there are numerous operational and organisational issues that impact on morale, including the perception that they receive low levels of support from management and government. Such issues have been documented in the past. For example, a study by Deery and Iverson, undated: 11) noted:

> The creation of a more co-operative and harmonious relationship between MFESB, the United Firefighters Union and firefighters will increase the commitment of employees to MFESB and reduce absenteeism. Such a relationship requires that the MFESB behave in a manner which encourages employee involvement, responds to firefighter's suggestions, shares information, and seeks improvements through joint problem solving.

Recent cuts to the budgets of both organisations by the state government do not auger well for implementing effective strategies to minimise workplace stress such as ensuring adequate staffing and operational capacities as recommended by WorkSafe Victoria and Comcare (2008). Funding cuts may have serious implications for operational effectiveness and further damage morale. This topic was raised by several focus group participants who expressed concerns about the impact of budget cuts on their ability to provide efficient and effective front-line services. Budget cuts will increase the already high levels of stress that firefighters operate under and could increase absences through increased rates of psychological injury and lower morale as well as reducing the effectiveness of fire protection to the community.

References

ABS (2011) *Work-Related Injuries, 2009-10*, Cat no. 6324.0, ABS Canberra

ABS (2012) *Gender Indicators, Australia, Jan 2012*, Cat. No. 4125.0, Australian Bureau of Statistics, Canberra.

AIHW (Australian Institute of Health and Welfare) (2010) *Chronic disease and participation in work, 2009, Cat. No. PHE 109*, AIHW, Canberra.

Antonellis, J., Meshad, F. S. and Stack, D. (2006) 'Understanding Post Traumatic Stress Disorder', *Fire Engineering*, December, 85-88.

ASFASP (American Red Cross Advisory Council on First Aid, Aquatics, Safety and Preparedness) (2010) *ACFASP Scientific Review: Critical Incident Stress Debriefing*, ASFASP.

Australian Centre for Posttraumatic Mental Health (ACPMH) (2007) *Australian Guidelines for the Treatment of Adults with Acute Stress Disorder and Posttraumatic Stress Disorder*, ACPMH, Melbourne.

Bacharach, S. B., Bamberger, P. A. and Doveh, E. (2008) 'Firefighters, Critical Incidents, and Drinking to Cope: The Adequacy of Unit-Level Performance Resources as a Source of Vulnerability and Protection', *Journal of Applied Psychology*, Vol. 93, No. 1, 155-169.

Baker, S. R. Williams, K. (2001) 'Short Communication: Relation between social problem-solving appraisals, work stress and psychological distress in male firefighters', *Stress and Health*, 17, 219-229.

Baris, D., Garrity, T. J., Telles, J. L., Heineman, E.F., Olshan, A. and Zahm, S. H. (2001) 'Cohort Mortality Study of Philadelphia Firefighters', *American Journal of Industrial Medicine*, 39, 463-476.

Barnes, P. (1997) 'A risk-based approach to occupational stress among urban firefighters', *Journal of Occupational Health and Safety, Australia and New Zealand*, 549-555.

Barnes, P.H. (2000) 'The experience of Traumatic Stress among urban firefighters', *Australian Journal of Emergency Management*, Summer 1999-2000, 59-64.

Bastians, K. 'Workers compo win for firefighters', *The West Australian*, 1 November 2012.

Bates, M. N. (2007) 'Registry-based case-control study of cancer in California firefighters', *American Journal of Industrial Medicine*, 550(5), 339-44.

Bates, M., Fawcett, J., Garrett, N., Arnold, R., Pearce, N. and Woodward, A.(2000) 'Retrospective cohort study of mortality and cancer incidence in New Zealand fire fighters', *Institute of Environmental Science and Research Ltd*, Porirua and Wellington School of Medicine, Wellington South.

Beaton, R., Murphy, S., Johnson, C., Pike, K. and Corneil, W. (1998) 'Exposure to Duty-Related Incident Stressors in Urban Firefighters and Paramedics', *Journal of Traumatic Stress*, Vol. 11, No. 4, 821-828.

Birch, A. (2011) *Recruiting and Retaining Volunteer Firefighters in Australasia: An Integrated Summary of Research*, Report No. 2:2011, Bushfire CRC, Bundoora.

Boudreaux, E. D. and McCabe, B. (2000) 'Critical Incident Stress Management: I. Interventions and Effectiveness', *Psychiatric Services*, Vol. 51, No. 9, 1095-1097.

Boyle, M.J., Williams, B., Bibby, C. Morton, A and Huggins, C. (2010) 'The first 7 years of the metropolitan fire brigade emergency responder program – an overview of incidents attended', *Open Access Emergency Medicine*, 2010:2, 77-82.

Boxer, P. and Wild, D. (1993) 'Psychological distress and alcohol use among fire fighters', *Scandinavian Journal of Environmental Health*, 19(2), 121-125.

Brown, J.B. and Stickford, J.S. (2009) *Physiological responses to structural firefighting observed in professional firefighters*, Indiana University Firefighter Health & Safety Research. April 2009.

Brown, J., Mulhern, G. and Joseph, S. (2002) 'Incident-Related Stressors, Locus of Control, Coping, and Psychological Distress Among Firefighters in Northern Ireland', *Journal of Traumatic Stress*, Vol. 15, No. 2, 161-168.

Brough, P. (2004) 'Comparing the Influence of Traumatic and Organizational Stressors on the Psychological Health of Police, Fire, and Ambulance Officers', *International Journal of Stress Management*, Vol. 11, No. 3, 227-244.

Bryant, R. A. and Guthrie, R. M. (2007) 'Maladaptive Self-Appraisals Before Trauma Exposure Predict Posttraumatic Stress Disorder', *Journal of Consulting and Clinical Psychology*, Vol. 75, No. 5, 812-815.

Bryant, R. A. and Harvey, A. G. (1995) 'Posttraumatic Stress in Volunteer Firefighters: Predictors of Distress, *The Journal of Nervous and Mental Disease*, Vol. 83, No. 4, 267-271.

Bryant, R. A. and Harvey, A. G. (1996) 'Posttraumatic Stress Reactions in Volunteer Firefighters', *Journal of Traumatic Stress*, Vol. 9, No. 1, 51-62.

CFA (2010) *2010 Annual Report*, CFA, Burwood East, Victoria.

CFA (2011) *Emergency medical response*, CFA, Burwood East, Victoria.

CFA (2012) *Annual Report 2011-12*, CFA, Burwood East, Victoria.

CFA, AV and MFB (2011) *EMR Operational Guidelines: Clinic Guidelines*, Draft 1-30 May 2011, CFA, Burwood East, Victoria.

Chen, Y-S., Chen, M-C., Chou, F. H-C, Sun, F-C, Chen, P-C. and Tsai, K-Y. (2007) 'The relationship between quality of life and posttraumatic stress disorder or major depression for firefighters in Kaohsiung, Taiwan', *Quality of Life Research*, 16: 1289-1297.

Clarke, C. and Zak, M. J. (1999) 'Fatalities to Law Enforcement Officers and Firefighters, 1992-97', *Compensation and Working Conditions,* Summer, 1999, 3-7.

Coggon D, Harris EC, Brown T, Rice S, Palmer KT (2009) *Occupational mortality in England and Wales, 1991–2000*, Office for National Statistics, London.

Comcare (2008) *Working Well: An organisational approach to preventing psychological injury*, Comcare, Canberra.

Community Development and Justice Standing Committee (2012a) *Inquiry into the recognition and adequacy of the responses by state government agencies to experience of trauma by workers and volunteers arising from disasters,* Transcript of evidence taken at Melbourne, Tuesday, 3 July 2012, Session Five, Parliament of Western Australia.

Community Development and Justice Standing Committee (2012b) *Inquiry into the recognition and adequacy of the responses by state government agencies to experience of trauma by workers and volunteers arising from disasters,* Transcript of evidence taken at Melbourne, Tuesday, 3 July 2012, Session Three, Parliament of Western Australia.

Community Development and Justice Standing Committee (2012c) *Inquiry into the recognition and adequacy of the responses by state government agencies to experience of trauma by workers and volunteers arising from disasters,* Transcript of evidence taken at Perth, Wednesday, 23 May 2012, Session One, Parliament of Western Australia.

Corneil, W., Beaton, R., Murphy, S., Johnson, C. and Pike, K. (1999) 'Exposure to Traumatic Incidents and Prevalence of Posttraumatic Stress Symptomatology in Urban Firefighters in Two Countries', *Journal of Occupational Health Psychology*, Vol. 4, No. 2, 131-141.

Corrigan, M., McWilliams, R., Kelly, K. J., Niles, J., Cammarata, C., Jones, K, Wartenberg, D., Hallman, W. K., Kipen, H. M., Glass, L., Schorr, J. K., Feirsstein, I. and Prezant, D. J. (2009) 'A Computerised, Self-Administered Questionnaire to Evaluate Posttraumatic Stress Among Firefighters After the World Trade Center Collapse', *American Journal of Public Health*, Supplement 3, Vol. 99, No. 53, S702-S709.

Crawford, J. O. and Graveling, R. A. (2012) 'Non-cancer occupational health risks in firefighters', *Occupational Medicine*, 62, 485-495.

Dean, P. G., Gow, K. and Shakespeare-Finch, J. (2003) 'Counting the Cost: Psychological Distress in Career and Auxiliary Firefighters', *The Australasian Journal of Disaster and Trauma Studies*, 2003-1.

Deery, S.J. and Iverson, R. D. (undated) *Attendance management at Metropolitan Fire and Emergency Services Board*, University of Melbourne, Melbourne.

Del Ben, K. S., Scotti, J. R., Chen, Y-C and Fortson, B. L. (2006) 'Prevalence of posttraumatic stress disorder symptoms in firefighters', *Work and Stress*, March 2006, 20 (1), 37-48.

Department of Education, Employment and Workplace Relations (2011) *Inquiry into the provisions of the Safety, Rehabilitation and Compensation Amendment(Fair Protection for Firefighters) Bill 2011,* Submission to the Senate Education, Employment and Workplace Relations Legislation Committee, DEEWR, Canberra.

Donnelly, E. and Siebert, D. (2009) 'Occupational risk factors in emergency medical services', *Prehospital and Disaster Medicine*, Vol. 24, No. 5, 422-429

Fire Brigades Union (2008) *In the line of duty: Firefighter deaths in the UK since 1978*, Fire Brigades Union.

Fire Engineering (2012) *Research: 90 Percent of Firefighters Show Signs of PTSD*, viewed 15 January, 2013, available at: www.fireengineering.com.

Fahy, R.F., Le Blanc, P.R. and Molis, J.L. (2012) *Firefighter Fatalities in the United States – 2011*, Fire Analysis and Research Division, National Fire Protection Association.

Farnsworth, J. K. and Sewell, K. W. (2011) 'Fear of Emotion as a Moderator Between PTSD and Firefighter Social Interactions', *Journal of Traumatic Stress*, Vol. 24, No. 4, 444-450.

Gist, R., Taylor, V. H. and Raak, S. (2011) *Suicide Surveillance, Prevention, and Intervention Measures for the US Fire Service: Findings and Recommendations for the Suicide and Depression Summit,* National Fallen Firefighters Foundation, Baltimore, Maryland.

Graveling, R. A. and Crawford, J. O. (2010) *Occupational health risks in firefighters*, Strategic Consulting Report: P530, IOM.

Guidotti, T.L. (2003) *Evaluating the Association Between Selected Cancers And Occupation as a Fire fighter, Report to the British Columbia Professional Fire Fighters Association*, The George Washington University Medical Center, Washington

Guidotti, T.L. (2005) *Evaluating Causation for Occupational Cancer Among Firefighters: Report to the Workers' Compensation Board of Manitoba*, The George Washington University Medical Center, Washington.

Guidotti, T.L. (2007) 'Evaluating causality for occupational cancers: the example of firefighters', *Occupational Medicine*, 57, 466-471.

Guidotti, T. L. and Clough, V. M. (1992) 'Occupational Health Concerns of Firefighting', *Annual Review of Public Health*, 13, 151-171.

Guidotti, T.L and Goldsmith, D.F. (2002) 'Report to the Workers Compensation Board of Manitoba on the Association Between Selected Cancers and the Occupation of Firefighter', *Workers Compensation Board of Manitoba*.

Guthrie, R. M. and Bryant, R. A. (2005) 'Auditory Startle Response in Firefighters Before and After Trauma Exposure', *American Journal of Psychiatry*, 162: 2, February, 283-290.

Harris, M. B., Baloglu, M. and Stacks, J. R. (2002) 'Mental health of trauma-exposed firefighters and critical incident stress debriefing', *Journal of Loss and Trauma*, 7, 223-238.

Haslam, C. and Mallon, K. (2003) 'A preliminary investigation of port-traumatic stress symptoms in firefighters', *Work and Stress*, July-September, Vol. 17, No. 3, 277-285.

Haywood, D. and Groenhart L (2010) *The case for a single fire fighting service in Victoria: A Submission to the Bushfire Royal Commission*, RMIT University, Melbourne.

Heinrichs, M., Wagner, D., Schoch, W., Leila, M. et al. (2005) 'Predicting Posttraumatic Stress Symptoms From Pretraumatic Risk Factors: A 2-Year Prospective Follow-Up Study in Firefighters', *The American Journal of Psychiatry*, Dec 2005, 162, 12, 2276-2286.

Jeanette, J. M. and Scoboria, A. (2008) 'Firefighter preferences regarding post-incident intervention', *Work and Stress*, Vol. 22, No. 4, October - December, 314-326.

Kang, D., Davis, L. K., Hunt, P. and Kriebel, D. (2008) 'Cancer incidence among male Massachusetts firefighters, 1987-2003', *American Journal of Industrial Medicine*, 51(5), 329-35

Kaplan, Z., Iancu, I. and Bodner, E. (2001) 'A Review of Psychological Debriefing After Extreme Stress', *Psychiatric Services*, Vol. 52, No. 6, 824-827.

Karter, M.J. and Molis, J.L. (2012) *U.S. Firefighter Injuries – 2011*, National Fire Protection Association.

Kleim, B. and Westphal, M. (2011) 'Mental Health in First Responders: A Review and Recommendation for Prevention and Intervention Strategies', *Traumatology*, 17(4), 17-24.

Landen, S. M. and Wang, C-C. D. C. (2010) 'Adult attachment, work cohesion, coping, and psychological well-being of firefighters', *Counselling Psychology Quarterly*, 23: 2, 143-162.

Landrigan, P. J., Golden, A. L. and Markowitz, S. B. (2005) *Occupational cancer in New York City firefighters*, The Department of Community Medicine, City University of New York.

LeMasters, G. K., Genaidy, A. M., Succop, P., Deddens, J., Barriera-Viruet, H., Dunning, K. and Lockey, J. (2006) 'Cancer Risk Among Firefighters: A Review and Meta-analysis of 32 Studies', *JOEM*, Volume 48, Number 11, November 2006, 1189-1202.

Malek, M. D. A. (2010) 'Stress and psychological well-being in UK and Malaysian fire fighters', *Cross Cultural Management: An International Journal*, Vol. 17, No. 1, 50-61.

McFarlane, A. C. (1988) 'The aetiology of post-traumatic stress disorders following a natural disaster', *The British Journal of Psychiatry*, 152, 116-121.

McFarlane, A. C., Atchison, M., Ralowicz, E. and Papay, P. (1994) 'Physical symptoms in post-traumatic stress disorder', *Journal of Psychiatric Research*, Vol. 38, No. 7, 715-726.

McFarlane, A. C. and Bryant, R. A. (2007) 'Post-traumatic stress disorder in occupational settings: anticipating and managing the risk', *Occupational Medicine*, 57, 404-410.

MFB (2007) *Key performance Monitoring Report* April-June 2007

MFB (2012a) *Annual Report 2011-12*, MFB, Melbourne.

MFB (2012b*) Strategic and Business Plan 2012-13*, MFB, Melbourne.

MFESB (2009) *Annual Report 2008 – 2009*, Metropolitan Fire and Emergency Services Board, East Melbourne, Victoria.

Murphy, S. A., Beaton, R. D., Pike, K. C. and Johnson, L. C. (1999) 'Occupational Stressors, Stress Responses, and Alcohol Consumption Among Professional firefighters: A Prospective, Longitudinal Analysis', *International Journal of Stress Management*, Vol. 6, No. 3, 179-196

Murphy, J., Smith, F. and Roberts, P. (2012) 'Absenteeism reflects sick organisation', *AFR, 7 February, 2012.*

Nixon, S. J., Schorr, J., Boudreaux, A, and Vincent, R. D. (1999) 'Perceived Sources of Support and Their Effectiveness for Oklahoma City Firefighters', *Psychiatric Annals*, Feb. 1999, 29, 2, 101-105.

North, C. S., Tivis, L., McMillen, J. C., Pfefferbaum, B., Cox, J., Spitznagel, E. L., Bunch, K., Schorr, J. and Smith, E. M. (2002) 'Coping, Functioning, and Adjustment of Rescue Workers After the Oklahoma City Bombing', *Journal of Traumatic Stress*, Vol. 15, No. 3, June 2002, 171-175.

Perrin, M.A., DiGrande, L. Wheeler, K., Thorpe, L., Farfel, N. and Brackbill, R. (2007) 'Differences in PTSD Prevalence and Associated Risk Factors Among World Trade Center Disaster Rescue and Recovery Workers', *American Journal of Psychiatry*, 164:9, 1385-1394.

Picking Up the Pieces (undated) Post Traumatic Stress Disorder Statistics, viewed 12 December, 2012, available at: http://pickingupthepeaces.org.au/post-traumatic-stress-disorder-statistics/

Prati, G., Pietranoni, L. and Cicognani, E. (2010) 'Self-efficacy moderates the relationship between stress appraisal and quality of life among rescue workers', *Anxiety, Stress & Coping*, Vol. 23, No. 4, 463-470.

PriceWaterhouseCoopers (2010) *Workplace wellness in Australia: Aligning action with aims: Optimising the benefits of workplace wellness*, PWC.

Regehr, C, Hemsworth, D. and Hill, J. (2001) 'Individual Predictors of Posttraumatic Distress: A Structural Equation Model', *Canadian Journal of Psychiatry*, Vol. 46, March 2001, 156-161.

Riolli, L. and Savicki, V. (2012) 'Firefighters' Psychological and Physical Outcomes After Exposure to Traumatic Stress: The Moderating Roles of Hope and Personality', *Traumatology*, 18(3), 7-15.

Safe Work Australia (2009) *Work-Related Injuries in Australia, 2005-06: The impact of shiftwork on work-related injuries in Australia,* Work Safe Australia, Canberra.

Safe Work Australia (2012) *The Cost of Work-related Injury and Illness for Australian Employers, Workers and the Community, 2008-09,* Safe Work Australia, Canberra.

Szubert, Z. and Sobala, W. (2002) 'Work-related injuries among firefighters: sites and circumstances of their occurrence', *International Journal of Occupational Medicine and Environmental Health,* Vol. 15, No. 1, 49-55.

Tull, M. (2008) *Protective Factor,* viewed 15 December 2012, available at: http://ptsd.about.com/od/prevalence/a/Firefighters.htm

Varvel, S. J., He, Y., Shannon, J. K., Tager, D., Bledman, R. A., Chaichanasakul, A., Mendoza, M. M. and Mallinckrodt, B. (2007) 'Multidimensional, Threshold Effects of Social Support in Firefighters: Is More Support Invariably Better?', *Journal of Counselling Psychology,* Vol. 54, No. 4, 458-465.

Wagner, D., Heinrichs, M. and Ehlert, U. (1998) 'Prevalence of Symptoms of Posttraumatic Stress Disorder in German Professional Firefighters', *American Journal of Psychiatry* , 155, 1727-1732.

Wagner, S. L., McFee, J. A. and Martin, C. A. (2010) 'Mental Health Implications of Fire Service Membership', *Traumatology,* Vol. 16, No. 2, 26-32.

Walton, S. M., Conrad, K. M., Furner, S. E. and Samo, D. G. (2003) 'Cause, Type, and Workers' Compensation Costs of Injury to Fire Fighters', *American Journal of Industrial Medicine,* 43, 454-458.

Weiss, D. S., Marmar, C. R., Metzler, T. J. and Ronfeldt, H. M. (1995) 'Predicting Symptomatic Distress in Emergency Services Personnel', *Journal of Consulting and Clinical Psychology,* Vol. 63, No. 3, 361-368.

WorkCover (2010) *Statistical Bulletin 2008/09: New South Wales Workers Compensation,* WorkCover, Sydney.

WorkplaceOHS (2012) *SA firies set to gain presumptive cancer compo, 6 November 2012,* viewed 15 December 2012, available at: http://www.workplaceohs.com.au/hazards//sa-firies-set-to-gain-presumptive-cancer-compo.

WorkSafe Victoria (2012) *WorkSafe Victoria: Statistical Summary 2011/12,* WorkSafe Victoria, Melbourne.

[1] The authors are Research Professor of Economics and Director of Centre of Full Employment and Equity at the Charles Darwin University, Australia (Mitchell) and Research Fellow, Centre of Full Employment and Equity at the University of Newcastle, Australia (Cook).
[2] Priority 0 emergency medical incidents include breathing problems, cardiac or respiratory arrest, choking, convulsions/seizures (not breathing0, drowning, electrocution/lightning.
[3] In 2005, US firefighters suffered 765 on-duty heart attacks, of which only 62 (8.1 per cent) resulted in sudden death.
[4] The groups were matched on age, years of service, ethnicity and occupations that had similar income.
[5] The age standardised rates allow the comparison of death rates between populations with different age structures, facilitating comparisons over time as the population structure changes.
[6] Female firefighters make up are only around 2 to 3 per cent of MFB firefighters
[7] Weights: incidents ranked one were multiplied by 10, those ranked two were multiplied by 9 and so on, and the scores were then totalled.