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A Holistic Review of the Health and Wellness Programs of Victorian Emergency Services

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A Holistic Review of the Health and Wellness Programs of Victorian Emergency Services

An Interactive Qualifying Project submitted to the faculty of
Worcester Polytechnic Institute
in partial fulfilment of the requirements for the
Degree of Bachelor of Science by:

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Submitted to:

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This report represents the work of three WPI undergraduate students submitted to the faculty as evidence of completion of a degree requirement. WPI routinely publishes these reports on its web site without editorial or peer review.

ABSTRACT

This project was designed to assist the Emergency Services Foundation to support the health of emergency workers in Victoria, Australia by conducting a holistic review of the health and wellness programs of six emergency response organisations. We achieved our goals through conducting interviews with health supervisors and groups of workers, as well as reviewing health statistics. We developed recommendations that aimed to close the gaps between wellness needs and the programs offered, identified notable practices, and created a listing of all the programs offered by the organisations.

ACKNOWLEDGMENTS

We would like to acknowledge several people who helped us complete this project and make us feel welcomed. Firstly, we would like to thank our sponsors, Laurie Lavelle and Jenny Davis from the Emergency Services Foundation, for providing us with the opportunity to work on this project. They were most generous in making sure that we had everything that we needed and were comfortable. Metropolitan Fire Brigade provided us with luxurious office space and ample equipment for each of us. The staff included us in their office-wide activities and also offered to help us with our project in any way possible. Our sponsors and Phil McInerney, from Metropolitan Fire Brigade, set up all of our initial contacts along with an introduction forum.

Next we would like to thank our project advisors, Professor Chrysanthe Demetry and Professor Richard Vaz, for providing feedback on hundreds of pages of drafts and guidance throughout the term. This thank you is extended to Professor Robert Hersh, our proposal advisor, for helping us to prepare our proposal, and to Laura Hanlan, our assigned librarian, for helping us with our initial research. Also thank you to Professor Ault for coordinating this abroad site in Australia. Finally we would like to thank everyone that we interviewed, including Worcester EMS. Several of these interviewees went out of their way to set up additional interviews for us and make sure that we had all the information we needed. Attendees of the forums were helpful in providing us with useful feedback on our project. This project could not have been completed without the help of all of these people.

EXECUTIVE SUMMARY

The emergency services in Victoria, Australia are provided mainly by six independent organisations. The organisations consist of a mixture of volunteers and career workers, all of whom need to be in good health to continue their work. Some common health problems faced by this group are musculoskeletal injuries, heart attacks, and psychological trauma. The current ageing of the work force and demanding nature of the work they perform exacerbate all of these issues. The Emergency Services Foundation (ESF), which commissions research of interest to the six organisations, believes that a study of the wellness programs would greatly assist in the maintenance of emergency workers' health by increasing awareness among the organisations about the programs of the others. An increased awareness would facilitate the exchange of successful practices and possible opportunities for improvement.

This project was designed to assist the Emergency Services Foundation to support the health of emergency workers in Victoria by conducting a review of the health and wellness programs provided to the workers of the Ambulance Victoria (AV), Coast Guard, the Country Fire Authority (CFA), the Metropolitan Fire Brigade (MFB), the State Emergency Service (SES), and Victoria Police (VicPol). Our goal was to perform a holistic review of the programs of the six organisations, which we achieved through the following research objectives:

1. Review health and wellness needs in relation to the culture and operation of each organisation.
2. Determine current practices of wellness programs for emergency service workers.
3. Identify notable practices and gaps between needs and programs in order to frame recommendations for improvements.

We accomplished these objectives by conducting familiarisation interviews, in depth interviews with supervisors, and group interviews with workers. In total we interviewed 20 supervisors and 30 workers in the six organisations. The number of workers that we interviewed is a very small sample of those within each organisation, and therefore cannot be considered a reliable representation.

We also reviewed existing health and wellness data from the organisations, which we used to identify needs. These data included reports on Workcover claims from VicPol, MFB, CFA, and SES; a report on a health survey conducted by AV; the Protecting our People strategy directive from VicPol; and Brigade Medical Services reports from MFB. All of these statistics were from the years 2006 to 2011. These data were limited by the amount of information that the organisations were allowed to give us without breaching confidentiality. The Workcover claims data likely underrepresented the number of physical and psychological injuries since Workcover is a self-reported system to support employees who have been injured. Employees who did not want or need assistance would not file a claim, and thus not appear in the data.

Health and Wellness Needs of Emergency Service Workers in Victoria

Our interviews and data analysis revealed the following findings in regard to common health and wellness needs across emergency service workers in Victoria:

Strains and sprains are the most frequently occurring injury. During every interview strains and sprains were reported as the most common physical problem. Workcover data from MFB, CFA, SES, and VicPol also confirmed this. The interviewees, along with the Protecting our People documentation provided by VicPol, indicated that many of the duties required of a responder put them at risk to a musculoskeletal injury, either from sudden movements, awkward movements, or heavy lifting.

All agencies share the need to promote workers' long term health through healthy lifestyle choices. Supervisors in all organisations expressed concern about their workers' smoking, eating, and exercise habits. These were all noted to be negatively affected by shift work. Supervisors also expressed concern about the heart health of their employees. Heart problems are the leading cause of death in Australia according to documentation provided by ESV Healthwatch.

Workers in all organisations share similar challenges in regards to psychological well-being. Critical incident stress is the highest single cause of claims for psychological stress among SES, VicPol, and MFB. Critical incident stress was one of the highest concerns among the psychological experts of the agencies and one of the largest targets of the psychological welfare programs. In addition to critical incident stress, workers, peers, and mental health professionals stressed that the emergency services is a job like any other, with similar workplace issues. Workplace issues can include bullying, harassment, and lapses in professional boundaries. Shift work has been shown to cause stress due to difficulties in relationships and family life (Elliot, 2007), and this was supported through our interviews.

Typical Health and Wellness Programs and Notable Practices

We used the information obtained from our interviews to create a program listing which summarises the programs offered by the organisations, as well as a comparison table across the major identified program types. From the listing and comparison of programs, we found that all agencies have similar systems for:

- Injury reporting and follow up programs that address injuries by assisting in preventing their reoccurrence, gathering data on trends, and facilitating recovery.
- Behavioural modification including support for smoking cessation and nutritional advice, which is often shared through brochures and posters.
- Health monitoring that is voluntary, on demand, and includes at least blood pressure, cholesterol, and glucose checks; height, weight, and waist measurements; and an explanation of the results.
- Recruit testing for career workers including medical evaluations, fitness tests which vary in difficulty between organisations, and psychological evaluations for a few of the organisations.

- Peer support consisting of peers who apply to receive special training in psychological first aid to help their co-workers through stress and traumatic incidents.
- Psychological support for critical incidents occurring either while the incident is in progress or afterwards so that the workers have someone to talk to who knows what they have been through.

Using responses from our supervisor and worker interviews as well as the program comparison table, we highlighted programs that are unique, highly thought of, or thorough. These programs are:

AV's Manual Handling and Back to Basics Training: This is the only program that regularly teaches workers the proper techniques for lifting victims and using equipment in a manner which attempts to avoid injury. Both programs are mandatory and must be attended every two years. Manual Handling Training aims to lower the occurrence of back injuries through the teaching of proper lifting techniques. Back to Basics offers training in new equipment and how to avoid brute strength lifting and is supplemented by online materials.

MFB's Core Strength and Functional Strength Training Program: These are the only programs of the organisations that we reviewed that attempt to reduce injury by strengthening core muscles through exercise and increasing physical resilience. The Core Strength Program teaches participants to activate their core muscles to reduce the occurrence and impact of back injuries. The Functional Strength Training Program aims to improve fire fighting capacity in seven Functional Movement Patterns in order to decrease the chance of sustaining an injury.

SES's Safegate: Safegate is an online occupational health and safety system utilised by SES. It was developed to be very user friendly and allows users to keep track of their reports to ensure they are being addressed. When it is completed, Safegate will contain analysis tools for managers that will help them identify common injury causes, helping to prevent further injuries. In the month and a half that Safegate has been active, it has received a very positive response, including high usage compared to the previous system and good feedback.

ESV Healthwatch: Healthwatch is a series of health checks that test the participant's cardiac risk. The Healthwatch team visits the different volunteer brigades of CFA, SES and Coast Guard. The results are discussed with the worker and entered into the Heart Track Online website, which the participants are given access to. This is the only health monitoring program available to volunteers, and over 4000 volunteers have used it since it started in 2004, with participation rates increasing every year.

VicPol's Mandatory Duty Based Fitness Testing: In addition to operational safety and tactical training, workers hired after July 1, 2010 are required to pass a duty based fitness test every six months. This fitness test is largely the same that is required for recruitment, ensuring that workers maintain the same minimum level of fitness throughout their careers. This is unique to VicPol and was welcomed by the workers to whom we spoke.

CFA's Healthy for Life: This is a set of voluntary programs offered to CFA's career workers. They include health checks, fitness assessments, and exercise classes. It addresses the most types of health and wellness needs of any single program we identified.

MFB's Fitness Leaders: Fitness leaders are occupational staff trained in fitness instruction, which is unique to MFB. The primary roles of the fitness leaders are to implement the programs developed by the Health and Fitness Unit and to serve as a resource for their co-workers in health and fitness matters. This is beneficial because the fitness leaders are more knowledgeable of the type of work that their co-workers perform and gives fire fighters a fitness resource that is constantly available to them at the station.

AV's Peer Support: AV's peer program has several features unique to it which are well regarded by other organisations such as: dejecting cases, having the dispatch unit alert the peers of critical incidents, having a peer response vehicle, and developing several initiatives such as the MANERS model, which is a system for addressing critical incident stress.

VicPol's Welfare Department: The role of Employee Support and Welfare Services is to provide a confidential support, information, advice, and referral service to all VicPol employees. The welfare officers perform all the same roles as peers but have more training and resources available to them and welfare is their full time job. The support service is unique because it provides a bridge between special services and policemen, referring workers to the resource that could best assist them. VicPol is the only organisation that has a unit dedicated to welfare.

Recommendations for Closing Gaps between Health Needs and Current Programs

While conducting our review, we noted that most pressing needs are well addressed within the agencies. However, in certain instances opportunities for improvement in the handling of certain needs are present. We present several recommendations that address the opportunities that were identified, with examples or explanations of possible ways to implement them.

Implement injury and stress preventative programs. Implementing injury prevention programs that are proactive could help to reduce claims based on strains and sprains rather than reactive programs which ease recovery after an injury has occurred. These types of proactive programs can include weight lifting, flexibility training such as yoga, and regular lifting training courses. Only AV and MFB currently offer programs that are proactive in addressing injuries by trying to prevent them.

Additionally, some examples of proactive programs that prevent workplace stress are seminars on proper workplace boundaries and workplace behaviour. Most of the organisations said that the majority of their psychological issues stem from the workplace environment. Workcover data on the organisations' psychological claims showed that workplace stress was almost as big of a problem as critical incident stress and PTSD.

Emphasise heart health checks, especially for at risk workers. Since almost all agencies are experiencing an ageing work force it is important for their workers be aware of their health risks. Both supervisors and workers indicated that health checks would be beneficial, especially for at risk workers such as smokers or those over the age of 50. Dr Jane Wadsley of the MFB suggested that regular scheduled visits to stations would make health checks more convenient and accessible to those who normally would not set up their own appointment.

Consider approaches to mandatory duty based fitness testing and medical checks. All of the supervisors that we talked to stressed that mandatory fitness assessments are very hard to implement without affecting employment security. VicPol's new mandatory fitness assessments are less threatening to the workers because they only affect new workers, as a condition of their employment, and not current workers. This approach could possibly be applied to mandatory medical checks so that all workers are aware of their current health and cannot shy away from being tested, which is often reported by supervisors and workers to be the case for workers who do not pay particular attention to their health.

Offer incentives for meeting fitness profile or getting a health check. If mandatory fitness or health assessments are not viable or are unfavourable, they can be made voluntary with incentives such as cash bonuses, recognition awards, insurance subsidies, or shift choices for people who meet or surpass the fitness profile or smaller prizes for those who get a health check. These were a few examples either suggested by workers or used in the United States. Discussion from a forum that we held with health and wellness supervisors from each agency revealed concerns that incentives are not effective at reaching at risk workers and might only benefit people who are already healthy.

Increase collaboration between organisations. Lastly, we conclude that an increased collaboration between all organisations on similar health and wellness challenges and initiatives would be beneficial for the improvement of wellness programs. To facilitate collaboration, we would like to propose a biannual forum facilitated by ESF entitled the Victorian Emergency Services Health and Wellness Forum. Many of those who came to the forum that we held expressed great interest in learning more about each other's programs. The flow of information between organisations had already begun before the forum was over. Some topics that could be focuses of future meetings are methods to measure the effectiveness of individual programs and methods of addressing drugs and alcohol issues. These issues were raised in our forum with the health and wellness managers. We hope that this collaborative group could use our project as a launching point for future endeavours.

AUTHORSHIP

The writing, editing, and revising of this report was a team effort in every step of the way. All members of the team made contributions to all aspects of putting this report together. Before we began writing a chapter, we would read through the IQP guidelines and decide on the important points that we wanted to address. If the chapter was long and had many sections like the Background, Methodology and Findings chapter, we would divide the writing evenly between us. If the chapter was short such as the Introduction or Executive Summary, we would write the chapter together.

Dan wrote sections 2.2 and 2.4 of the Background and 4.1 of the Findings chapter. Julia wrote section 2.3 of the Background, 4.4 of the Findings, and wrote and edited the Recommendation chapter. Shauna wrote sections 2.1 and 2.2 of the Background and 4.3 of the Findings. The Methodology was drastically reorganised and so authors of sections can no longer be identified. Our revising was done together, which often was a slow and laborious process but ensured that each person's view and opinions were heard so that the final product would truly be a representation of all of our work.

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1.0 INTRODUCTION

Australia, perhaps even more than other countries, relies on emergency service workers to protect its citizens against a variety of hazards. Australians face emergencies such as car accidents, house fires, medical emergencies, and crimes. Australia experiences, on average, eight major natural disasters per year that require coordinated multi-agency responses (“Natural Disasters in Australia”, 2002). These include bushfires, floods, and cyclones. Australia has more bushfires than any other country, more than 50,000 per year (“Natural Hazards”, 2011 and Sapienza, 2009). Two devastating bushfires were the Ash Wednesday fires of 1983 and the Black Saturday fires of 2009, which together took 248 lives and injured over 3,000 people (“About Ash Wednesday”, 2003 and “Black Saturday Bushfires”, 2011). Floods are the most costly disaster in Australia, costing AUD \$300-400 million yearly. Flooding in 2010 exceeded this, destroying 30,000 homes and businesses and causing at least AUD \$30 billion in damages (“Australia Flood Nightmare Only Getting Worse”, 2011 and ABC News, 2011). There have been 48 damaging floods in the past 30 years (PreventionWeb, 2011). All of these emergencies will continue to cause a dependence on emergency service workers in Australia.

Australia’s emergency response challenges are unique because not only is the country afflicted with frequent disasters, but it is dependent on a response force that is diminishing and not evenly distributed across the country (McLennan, 2008). Due to the country’s large size and sparse population density outside major cities, it is difficult for an emergency response organisation to protect the country. Given that the existing pool of emergency services workers is so limited, maintaining the health of emergency service workers is especially important. Some common health problems faced by this group are musculoskeletal injuries, heart attacks, and psychological trauma. The increasing age of the average emergency worker, as well as the demanding nature of the work they perform, exacerbate all of these issues.

In light of the importance of emergency workers, programs aimed at maintaining their health have become commonplace worldwide. Wellness programs are likely to keep the workers healthier, reduce absenteeism as well as the number of days taken for sick leave, lower the incidence of injury and long term illness, and help workers address issues related to stress (Sott, 2005). Common key components of wellness programs include physical and medical evaluations, fitness programs, behavioural modification, and psychological support.

The emergency services in Victoria, Australia are provided mainly by six independent organisations. The organisations consist of a mixture of volunteers and career workers, all of whom need to be in good health to continue their work. The Emergency Services Foundation (ESF), which commissions research of interest to the six organisations, believes that a study of the wellness programs would greatly assist in the maintenance of emergency workers’ health by increasing awareness among the organisations about the programs of the others. An increased awareness would facilitate the exchange of successful practices and possible opportunities for improvement.

This project was designed to assist the Emergency Services Foundation to support the health of emergency workers in Victoria by conducting a holistic review of the health and wellness programs provided to the workers of Ambulance Victoria (AV), Coast Guard, the Country Fire Authority (CFA), the Metropolitan Fire Brigade (MFB), the State Emergency Service (SES), and Victoria Police (VicPol). Our goal was to not only perform this review but to also determine notable practices, identify gaps between wellness needs and programs, and make recommendations for improvements. To accomplish this, we assessed the health and wellness needs of the organisations, identified the programs they had in place, and identified unaddressed needs. We made recommendations to address the unaddressed needs. In the course of our review, we developed a comprehensive listing of all the health and wellness programs offered by the organisations, a list of notable practices, and a comparison table showing overlap between the programs of each organisation.

2.0 BACKGROUND

This chapter examines health and wellness needs of emergency service workers and features of current international wellness programs. We first address the challenges faced by emergency service workers and the emergency services in Australia, highlighting common problems that can be mitigated through tailored wellness programs. We then review definitions of wellness and describe the components of current wellness programs from multiple countries for emergency service workers. We consider the barriers to implementing wellness programs, and conclude by providing an overview of six emergency service organisations in Victoria.

2.1 Challenges of Emergency Service Workers in Australia

Australia's geography, demography, and climate create a difficult environment for responding to emergencies. The country depends on emergency response agencies that are mainly staffed by volunteers (McLennan, 2008). In this section we look at some of the challenges faced by volunteers and staff on the job.

2.1.1 Incidence and Scale of Natural Disasters

A popular poem by Dorothea Mackellar describes Australia as "a land of droughts and flooding rains." Other natural disasters that Australia is prone to are: tropical cyclones, other types of severe storms, and wildfires. The country experiences, on average, eight disasters a year that require multi-agency response, with each disaster costing above AUD \$10 million worth of damage (Natural Disasters in Australia, 2002). These natural disasters devastate the continent, causing a great number of fatalities and huge financial burdens.

Australia is the second driest continent, behind Antarctica. Serious droughts cause heat waves and bushfires. Australia experiences more bushfires than any other country. Two of Australia's most famous fires are the Ash Wednesday Fire and Black Saturday that together claimed a total of 248 lives, caused 3014 injuries and destroyed over a million acres of land ("Black Saturday Bushfires", 2011 and "About Ash Wednesday", 2003). When it does rain, Australia is also prone to flooding. Floods cause AUD \$300-400 million in damage yearly. Flooding in 2010 exceeded this, destroying 30,000 homes and businesses and causing at least AUD \$30 billion in damages ("Australia Flood Nightmare Only Getting Worse", 2011 and ABC News, 2011).

According to a technical report done by the Commonwealth Scientific and Industrial Research Organisation (CSIRO) in 2007, Australia's climate is predicted to change for the worse. More record high temperatures and less record low temperatures are suggested. It has been predicted that it will rain less frequently and when it does rain it will be more extreme, which will be a danger for flooding. Predictions indicate that droughts will become more frequent, the south east will be at higher risk for fires, tropical cyclones will be more powerful, and sea levels will rise. All of these climate changes are predicted to result in more numerous and worsened natural disasters (CSIRO, Australian Bureau of Meteorology, 2007).

2.1.2 Dependence on Volunteers

Due to the country's large size and sparse population density outside of major cities, Australia's capacity to respond to emergencies greatly depends on volunteer-based organisations. The population density, 2.8 inhabitants per square kilometre, is among the lowest in the world, although 80 per cent of its population of about 22 million live within 100 km of the coast (Australian Bureau of Statistics, 2010). This makes forming an emergency service organisation capable of covering such a large area difficult due to a lack of population density to support it.

The emergency services organisations in Australia consist of volunteer workers, career workers, or a mix of the two. Over 82,000 emergency service (Emergency Services Foundation, n.d.) workers protect the 5.4 million citizens of Victoria (Australian Bureau of Statistics, 2010) from fires, crime, medical emergencies, and natural disasters. Volunteers make up approximately 78 per cent of the six organisations that we focus on ("Emergency Service Foundation", n.d.). Emergency service workers are responsible for providing emergency services 24 hours a day, 365 days a year.

Since Australia depends so heavily on volunteer emergency service workers, the continuation of services depends on a steady supply of volunteers over the years. This emphasises the importance of keeping those volunteers they already have healthy and able to perform their duties (McLennan, 2008).

2.2 Physical and Psychological Health of Emergency Workers

Preserving the health of emergency service workers enables them to continue to protect the community. Previous international studies have determined what common problems threaten the health of emergency responders. These studies were largely focused on three separate areas: injuries, long term complications, and psychological welfare, each of which gives indicators as to the health and wellness needs of different groups of emergency responders.

2.2.1 On the Job Injuries

There are several common injuries that affect emergency service workers. A study by Audrey Reichard, for the *American Journal of Industrial Medicine* on injury trends among emergency service workers, used data from the records of 67 emergency departments throughout the United States in 2000 and 2001. This study broke down emergency worker injuries by injury type, injury location, age, and gender of the injured party (Reichard, 2010). The injury type data from the study is summarised in Table 1.

Table 1: Emergency Responder Injuries Treated in US Emergency Departments

	EMS		Fire		Law Enforcement		Total	
	n=21000	%	n=36600	%	n=63500	%	n=121100	%
Sprain/Strain	9000	43	12100	33	21900	34	43000	36
Contusion/ Abrasions	2800	13	4800	13	17300	27	24900	21
Laceration	1200	6	4100	11	4800	8	10100	8
Fracture/ Dislocation	0	0	1700	5	2800	4	4500	4
Punctures	1700	8	0	0	2700	4	4400	4
Burns	0	0	2100	6	0	0	2100	2
Anoxia	0	0	1700	5	1100	2	2800	2
Dermatitis/ Conjunctivitis	0	0	1600	4	0	0	1600	1
Other	6300	30	8500	23	12900	20	27700	23

(Reichard, 2010)

These data show that strains and sprains were the most common injury type for this subset of U.S. emergency service workers. The study proposes that this is due to the motions regularly performed in the course of an emergency responder's duties (Reichard, 2010). Fire fighters and paramedics lift heavy loads such as hoses and victims, leading to strains. Police make sudden movements when restraining subjects, leading to sprains.

A study by the United States Federal Emergency Management Agency (FEMA) found that many factors influence the occurrence of an injury, its severity, and its outcome. The health of the individual sustaining the injury is one of the more important factors. An example given by FEMA is that fire fighting consists of periods of low activity punctuated by periods of intense, strenuous activity. Good physical condition is a critical component in the body's ability to transition successfully, without injury, between these two activity levels. Also, pre-existing medical conditions, including underlying medical conditions, affect the health and safety of fire fighters (FEMA, 2009). As we discuss in more detail below, many on duty deaths and injuries may have been avoided, or have been less severe, under the same conditions if there was no pre-existing condition.

2.2.2 Long Term Health

Our background research indicates that a concern among many emergency responders is each worker's long term health. A stressful lifestyle, intense physical exertion, and toxic exposure

are common concerns and risk factors for emergency responders. In a study of two Dallas, Texas fire departments, more than ten per cent of the fire fighters exhibited elevated levels of cholesterol and triglycerides, as well as hypertension and cancer indicators (Winter, 2010). Despite these results and their implications for underlying health problems, all fire fighters reviewed tested with superior physical fitness. This discrepancy gives an indicator that physical fitness testing may not be the best method to conduct a health review or the best measure of overall health (Winter, 2010). Regular health evaluations are capable of detecting indicators of potential long term health problems, making them a good complement to regular fitness testing.

Studies have also found certain exacerbating factors for long term health problems. Smoking and obesity are significant risk factors for cardiovascular disease that appear among fire fighters (Scanlon, 2008). According to information distributed to Healthwatch participants by Emergency Services Volunteer Healthwatch in Victoria, smokers have two to three times the risk of suffering sudden cardiac death than non-smokers. Heart conditions are a frequent cause of death among fire fighters. In the United States in 2007, almost 50 per cent of fire fighter fatalities were from heart attacks, making it the leading cause of death (Elliot, 2007). Age is also a major factor in the risk of hospitalisation for fire fighters. According to a study by Lee from 2004, fire fighters over the age of 50 are almost four times more likely to be hospitalised than those of similar age in any other profession.

Both interviews with Worcester EMS and a study by Dr Diane Elliot indicate that many emergency service workers work long shifts that do not allow them to get adequate sleep. Additionally, according to Worcester EMS, having a second job is very common among career American emergency service workers (Worcester EMS, Personal Communication, 2011 and Elliot, 2007). This further limits the amount of sleep that they get. Elliot also found that lack of sleep can lead to several physiological problems, such as cardiovascular disease, obesity, diabetes, digestive disorders and immune system illnesses. Elliot references studies that have found a direct relationship between the risk of myocardial infarction (cardiac arrests) and longer working hours, with a two-fold increase in risk associated with working more than 40 hours each week. The average emergency service worker in the U.S. works 54 hours a week, not including over time (Elliot, 2007). The same study showed that sleep deprivation and night shift work results in an up to six-fold increase in gastrointestinal disorders, such as peptic ulcers, indigestion, diarrhoea and constipation (Elliot, 2007).

2.2.3 Psychological Issues

Up to this point we have looked at injuries and long term health effects, but psychological issues are also a cause for concern in the emergency services (Burton, 2007). Emergency service workers are often responsible for the lives of others and this can be a risk factor for their mental health. Throughout the course of their careers, emergency workers frequently have to respond to events where human suffering and pain are present. This can lead to vicarious trauma, also known as secondary trauma or compassion trauma. Vicarious trauma refers to the distress experienced by persons who witness or hear about dreadful things that have happened to others. A report by Maia cited a 2009 survey of Portuguese medical

emergency workers that revealed that the most disturbing critical incidents are motor vehicle accidents that may include the confrontation with parts of human remains, dead bodies, and people trapped in crashed vehicles. Also, emergency service workers sometimes have to deal with their inability to help the victims or save lives (Maia, 2010).

An article by Kim O'Connell, on the psychological support needed for emergency workers after a disaster, states that disasters very often have a long term effect on those who respond to them. Post-Traumatic Stress Disorder is a commonly cited problem for emergency service workers. A 2003 study by R.D. Beaton found that Post-Traumatic Stress Disorder (PTSD) is present in epidemic levels among U.S. fire fighters, even higher than found in Vietnam Combat Veterans (Beaton, 2003). Effects of PTSD include: social isolation and withdrawal, relationship problems, increased rates of family dysfunction. Beaton found that these effects translate into the workplace as an increase in the rate of sick leaves, long term disability, and early retirement (Beaton, 2003). O'Connell's article states that it is possible that a stimulus can trigger an emotional response that one had from a previous catastrophic event. An example given in the article was a department responding to a wildfire in an area where they had previously lost members of their department while fighting a wildfire. The fire fighters showed significantly elevated stress and had memories triggered of the previous blaze. Therefore additional psychological support might need to be offered to workers if they have to respond to a disaster that is similar to one that they had dealt with previously (O'Connell, 2003).

The mentality of emergency responders might make it difficult for them to receive necessary psychological assistance. O'Connell looked at the emergency service workers who worked on site after the World Trade Center attacks. She suggests that an attitude of self-assigned toughness exists among emergency service workers. A Red Cross volunteer, Yael Saso, said that a lot of the workers did not want to talk or let down their defences so soon after the attacks, but they did seem to appreciate persons asking how they were doing. This tendency towards repressing emotions highlights a possible problem when trying to care for the mental health of these workers. They may try to suppress their emotions due to a need to be perceived as "tough" in their line of duty, which can make it difficult to assist those who are in need of support (O'Connell, 2003). Another interesting issue raised by Worcester EMS was that counselling often falls on deaf ears unless it comes from a fellow emergency service worker or someone who has been in that line of duty.

2.2.4 Fatalities among Emergency Service Workers

Most of the jobs performed by emergency service workers are high risk and, unfortunately, on-duty tasks can lead to career ending injuries, disabilities, and even death. In 2007, the United States Fire Association (USFA) reported 118 fire fighter fatalities (US Fire Administration, 2010). The leading cause of death among US fire fighters was heart attacks. The combination of cardiovascular risk and intense physical exertion is thought to be a contributing factor for the high occurrence of heart attacks (Elliot, 2007).

Despite the known risks, in the United States thousands of volunteer fire fighters and emergency medical personnel do not undergo regular medical checks or participate in programs for health improvement that can ameliorate the physical stress of emergency response (US Fire Administration, 2010). According to the USFA publication, “Four Years Later-A Second Needs Assessment of the U.S. Fire Service”, only one quarter of the surveyed departments nationwide have a program to maintain first responder fitness and health, such as is encouraged by NFPA 1500, *Standard on Fire Department Occupational Safety and Health Program*. It is likely that implementing health and wellness programs in emergency services departments could prevent or reduce injuries and deaths, since a body of evidence suggests that improved lifestyles reduce the risk of injury and death (FEMA, 2009).

2.3 Components of Wellness Programs

According to the International Association of Firefighters and the International Association of Fire Chiefs, health and wellness programs can help lower the incidence of health problems and fatalities among both career and volunteer emergency service workers (Sott, 2005). In this section, we first consider a definition of wellness, then describe key components of several wellness programs from the United States and Australia, identify criteria by which programs can be evaluated, and conclude by identifying difficulties in implementing a program.

2.3.1 Definition of Wellness

One expert on workplace wellness programs argues for the creation of organisation-specific definitions of wellness (Bates, 2009). In general, wellness is defined as “an active process of becoming aware and making choices toward a more successful existence” (“Definition of Wellness”, n.d.). Table 2 shows the aspects of the definition of wellness from Infinite Wellness Solutions, an international provider of wellness programs.

Table 2: Definition of Wellness

Dimension	Definition
Occupational	Being happy with one’s career.
Physical	Doing physical activity along with making healthy choices such as the cessation of tobacco, drugs, and excessive alcohol. Nutritional knowledge and good practice is also important.
Emotional/ Mental	Being aware of and accepting one’s feelings and not letting emotions take over, especially in the case of depression.
Financial	Being aware of one’s financial situation and being able to properly deal with it.

(“Definition of Wellness”, n.d.)

2.3.2 Core Missions and Key Features of Wellness Programs

In an attempt to design an idealised wellness program for emergency service volunteers, The United States Federal Emergency Management Agency (FEMA) identified five different beneficial features of a wellness program. These could also be applied to career workers. These features include: “regular fitness screenings and medical evaluations; fitness program (cardiovascular, strength, and flexibility training); behavioural modification (smoking, hypertension, diet, cholesterol, diabetes); volunteer education; and screening volunteer applicants” (FEMA, 2009). The features recommended by FEMA, as well as activities they suggest to implement each feature and the benefits to implementing them, are shown in Table 3.

Table 3: Key Components of the FEMA Program Framework

Components	Activities	Benefits
Fitness Screenings & Medical Evaluations	<ul style="list-style-type: none"> • Follow ACSM* Guidelines • Standardised examinations 	<ul style="list-style-type: none"> • Shows at what level they can participate in the program. • Early detection of diseases gives the workers a better chance of overcoming them. • Regular evaluations will ensure their health is staying consistently good.
Fitness Program	<ul style="list-style-type: none"> • Physical activity (moving around) • Exercise (repetitive movement) • Cardiorespiratory • Muscular and flexibility training 	<ul style="list-style-type: none"> • Improve physical condition and endurance. • Decrease chances of injuries and heart attacks. • Maintain good body composition. • Can also improve mental health and reduce stress.
Behavioural Modification	<ul style="list-style-type: none"> • Smoking cessation • Hypertension reduction • Nutritional education • Cholesterol reduction • Managing Diabetes 	<ul style="list-style-type: none"> • Reduce risk of first heart attack by 65%. • Teach the workers to lead healthy lifestyles. • Attain ideal body weight. • Lower blood pressure.
Volunteer Education	<ul style="list-style-type: none"> • Health • Orthopaedic • Ergonomic • Stress management • Injury prevention • Resiliency training 	<ul style="list-style-type: none"> • Well prepared for their duties. • Less likely they will get mental or physical health problems if they are aware of them.
Screening Volunteer Applicants	<ul style="list-style-type: none"> • Wildland fire fighter pack test • Candidate physical agility test (CPAT) designed for career but can be used for volunteers also. 	<ul style="list-style-type: none"> • Volunteers will be better fit for the job and be closer to career worker standards. • Determine whether the volunteers have the personality to be able to handle the emotional toll that they will probably experience.

*American College of Sports Medicine (FEMA, 2009)

Appendix A compares five different proposed and current wellness programs utilised in different countries. The program components are similar to those used by FEMA as shown in Table 3. The main focus of all these programs is fitness programs, medical screening, and behavioural modification. Neither the FEMA framework nor the examples given in Appendix A describe psychological support as an element of their health and wellness programs.

2.3.3 Criteria to Evaluate Wellness Programs

Through our research, we identified five major criteria which have been used in previous studies to identify effective programs. These criteria are: injury reduction, disability retirements, instances of long term health problems, absenteeism, and cost.

Injury reduction can be evaluated in several different ways. Injury rates are directly traceable through the number of work compensation claims and injury data collected by most agencies. In addition to injury reduction, disability retirements can also decrease in number due to the injury reducing effects of a wellness program. This improvement in the number of disability retirements is the second criterion with which programs can be evaluated.

Another criterion is the instance of long term health problems. The number of long term health problems should be decreased by an effective wellness program. Risk of long term health problems can be tracked through body weight, cholesterol, triglycerides, and blood pressure levels (Sott, 2005). Fitness and nutrition programs should improve these figures, and regular medical screening should be able to easily detect if long term health concerns need to be given more attention. If indicator levels are reduced then risk for heart and lung disease and cancer rates are likely to also be reduced.

In addition to workers living longer and healthier lives, they will also require less sick leaves if their health is improved by a wellness program. Terry Sott, wellness coordinator of the Vancouver Fire Department in Washington, United States, found in a study on fire fighter health and wellness programs that Riverside Fire Department and San Jose City Fire Department of California had a 10% and 22% decrease in absenteeism respectively after implementing wellness programs (Sott, 2005). This allows for fewer workers that are necessary to fill shifts.

Many of these criteria can also be measured by cost savings. These savings include reduced health care claims, which St. Paul Minnesota Police Department proved to have, disability pensions, and training replacement costs (Sott, 2005). Sott found that Riverside Fire Department and San Jose City Fire Department had a 23% and 12% decrease in medical cost, respectively, and Riverside also saved USD \$104,644 over three years due to their health and wellness programs (Sott, 2005). Smoking employees have USD \$1,000 more costly annual health care bills than similar non-smoking employees (Sott, 2005). This is one of the reasons that so many departments implement smoking cessation programs. In his study, Kanner found that the average cost due to a single back injury among emergency service workers in one U.S. city was USD \$8,000, not including the costs of surgery, disability retirement, or training replacements (Kanner, 1991). These are many examples of costs that could be reduced by a wellness program, and provide a way to measure the effectiveness of a wellness

program. FEMA states that the benefits of wellness programs have proven to outweigh the costs of implementing them (FEMA, 2009).

2.3.4 Difficulty in Implementing a Wellness Program

In its review, FEMA determined five major barriers that could impede the implementation of a wellness program. These are:

- Lack of funding
- Lack of well-defined requirements
- Lack of member motivation
- Heavy workloads with no break times
- Liability issues

Funding is important not only to get the wellness program up and running, but also to keep it running (FEMA, 2009). Some costs include the buying and maintaining of fitness equipment, medical and mental examinations, and behavioural modification tools.

The next three barriers all have to do with participation rates. One challenge for program managers is to decide which aspects of the program should be mandatory, if any at all. According to Worcester EMS (Personal Communication, February 9, 2011) too many mandatory programs could cause employees to quit, especially volunteers. Mark Neates, manager of corporate health at Western Australia Police, noted that in general emergency service workers tend to shy away from healthy behaviours and believe that using health services is a sign of weakness (Neates, 2009). FEMA suggests the use of incentives for participation in wellness programs. Proper incentives for using the wellness program give the opportunity to increase participation rates without the workers being forced to participate. FEMA believes that workers who would ordinarily be unwilling to participate in programs in fear of being thought weak could use the incentives as their reason for attending. FEMA states that the most effective incentives are personal or financial gain. These include cash prizes, fitness competitions, shift choices, or recognition awards to name a few (FEMA, 2009). Another significant barrier to participation identified by FEMA is time constraints. Many emergency service workers do not have enough time to work out during their shift. They may also have difficulty balancing their personal and work life, and so their health may be ignored. This barrier can be avoided by management setting time aside in the workers' days for wellness services (Neates, 2009).

The fifth barrier, liability issues, can also stop a department from implementing a wellness program. With any new program there are many liabilities. These can be lessened by consulting with the department's insurance company and legal counsel (FEMA, 2009). FEMA argues that managers must take into account that this may seem like a large burden, but there are even more liability issues that come from injuries resulting from not having a wellness program.

2.4 Emergency Services Foundation and Stakeholders

The Emergency Services Foundation wishes to investigate the application of wellness programs within the emergency services in Victoria. In this section we introduce the mission of the Emergency Services Foundation and then the six organisations that we looked at in this project. These organisations are the Country Fire Authority, the Metropolitan Fire Brigade, Victoria Police, Ambulance Victoria, Victoria State Emergency Service, and the Australian Volunteer Coast Guard. Each of the six organisations performs a different vital function. The organisations have different goals, different compositions, and different needs that may influence the health and wellness needs of their workers or the operations of their programs.

The Emergency Services Foundation (ESF) was founded in 1987 to support emergency service workers and their families in the event of injuries or fatalities. The ESF also works to provide support to the emergency service organisations. It does this through the disbursing of funds, the awarding of scholarships for emergency service education, and the commissioning of research projects to improve the health and safety of emergency workers (“Emergency Service Foundation”, n.d.). The ESF is a private organisation which receives its funding from the proceeds of a trust, charitable donations, and government support (“Alumni newsletter”, 2010 and “Emergency Service Foundation”, n.d.). The board of the ESF is composed of the heads of each agency and civilian advisors.

The ESF has sponsored past studies into the safety and effectiveness of emergency service workers. These include vehicular safety studies, procedure studies, and a study into cardiovascular health among fire fighters (“Emergency Service Foundation”, n.d.). Our project aims to further this research into health and safety in the emergency services by looking into the wellness programs of the six organisations.

Ambulance Victoria (AV) provides emergency medical services to all of Victoria’s residents. They employ 2,500 paramedics and respond to 500,000 emergency cases per year, a number equal to approximately 10% of Victoria’s population (Australian Bureau of Statistics, 2010). They provide emergency response, non-emergency transport, and air evacuation within Victoria’s borders (“Emergency Service Foundation”, n.d. and “Careers”, n.d.).

The Australian Volunteer Coast Guard is an organisation consisting entirely of volunteers. They conduct inland water rescue operations and answer calls for assistance from boaters. They are a national organisation, but their Victorian squadron is taking the lead on health and wellness initiatives.

The Country Fire Authority (CFA) provides fire fighting services to all of Victoria except for Melbourne and the national parks. The CFA consists of 60,000 members including 59,000 volunteers along with career fire fighters, community educators and support personnel. Brigades range in size from small rural stations to larger urban stations. Their work includes community education, search and rescue, and fire prevention and suppression. They protect 3.3 million Victorians and more than one million dwellings (“What We Do”, n.d.).

The Metropolitan Fire Brigade (MFB) provides fire suppression and emergency response services to all of Melbourne's three million residents. They are an entirely career organisation, with 1600 members providing coverage for 1000 square kilometres of urban Melbourne and suburbs. They also assist the CFA when needed ("Emergency Service Foundation", n.d. and "About the MFB", 2009).

Victoria Police (VicPol) is the primary law enforcement agency for Victoria, consisting of 13,800 police officers. They provide traffic enforcement, investigative services, and protection to all of Victoria.

Victoria State Emergency Service (SES) responds to emergency situations throughout Victoria. They respond to floods, storms, search and rescue needs, road rescues, and calls for assistance from other agencies. They are entirely a volunteer organisation, having 5,500 volunteers with a low number of permanent support staff ("Who We Are", 2008).

3.0 METHODOLOGY

This project was designed to assist the Emergency Services Foundation to support the health of emergency workers in Victoria by conducting a review of the health and wellness programs provided to the workers of Ambulance Victoria (AV), Coast Guard, the Country Fire Authority (CFA), the Metropolitan Fire Brigade (MFB), the State Emergency Service (SES), and Victoria Police (VicPol). Our goal was to perform a holistic review of the programs of the six organisations, determine notable practices, and make recommendations for improvements. Our objectives to complete this project were as follows:

1. Review health and wellness needs in relation to the culture and operation of each organisation.
2. Determine current practices of wellness programs for emergency service workers.
3. Identify notable practices and gaps between needs and programs in order to frame recommendations for improvements.

3.1 Assessment of Health and Wellness Needs

Our background research revealed the importance of tailoring health and wellness programs to the needs and culture of a particular organisation. Therefore we became familiar with the operations and culture of the organisations in order to understand the environment that would be inducing these needs. In order to achieve this, we conducted familiarisation interviews with a representative from each organisation.

During our familiarisation interviews, we looked into the organisations' history, culture and operations. Our intention was to gain a better understanding of some of the practices and attitudes workers possess. We hoped this understanding would help in determining the needs of the workers and making recommendations that were both appropriate and effective. We also endeavoured to gain an understanding of the rationale behind the organisations' current health and wellness programs. We interviewed health and wellness program managers who were considered to have a good knowledge of their organisation's programs and culture. Questions for these interviews are shown in the Appendix B.

In order to frame recommendations which addressed unmet needs of the emergency service workers, we decided to first identify needs, falling within three areas: injuries, long term health, and psychological wellness. In the sub-sections that follow we describe the pre-existing quantitative health and wellness data that we examined in each area. We also present research questions that guided collection of qualitative data about health and wellness needs during interviews with supervisors and workers. The details of those interview procedures will be explained in section 3.2.

3.1.1 Injuries

On the job injuries are a common problem among emergency service workers. To determine which injuries were of concern, we analysed existing data collected by the individual

agencies on the injuries their workers sustained. This included reports on Workcover claims from VicPol, MFB, CFA, and SES; a report on a health survey conducted by AV; a strategy directive, called Protecting our People from VicPol; and Brigade Medical Services reports from the MFB. Workcover is a self-reported worker compensation system. The data that we reviewed concentrated on the numbers of injuries, types of injuries, cause of injuries as well as the occupation of the personnel who sustained these injuries. The goal of this analysis was to detect injuries which should be addressed in a wellness program. These data were limited by the amount of data that the organisations were allowed to give us without breaching confidentiality. The Workcover claims data likely underrepresented the number of physical and psychological injuries since Workcover is a self-reported system to support employees who have been injured. Employees who did not need assistance would not file a claim, and thus not appear in the data.

To supplement these data, we made inquiries during the supervisor interviews into the most frequent injuries seen and areas of specific concern. In the group interviews, we attempted to answer the following research questions:

- What are the most frequently occurring injuries?
- What are the most physically challenging activities performed in the course of a responder's duties?

3.1.2 Long Term Health

Assessing needs for long term health maintenance was somewhat challenging, since long term conditions were often not readily apparent, masked by current injuries, or could only be detected by a doctor. Our analysis relied more on indicators, such as blood pressure and cholesterol, and qualitative data. Several research questions that we investigated were:

- How often do workers receive health checks?
- How aware are workers of their own risks for long term conditions?
- How many at risk workers does each organisation have, including smokers, those who are over 50, and those who are overweight?

These investigations took the form of document reviews and questions within the worker and supervisor interviews. The document reviews consisted of the report on AV's health survey, MFB's Brigade Medical Services reports, and data collected by VicPol's health promotion officers.

3.1.3 Psychological Health

Psychological health can also be maintained through wellness programs. This aspect of health is difficult to track, as it displays limited physical symptoms. It is also a subject most people tend to shy away from. Through interviews and examining Workcover claims, we attempted to answer the following research questions:

- What are the supervisors' and workers' perceptions of needs related to psychological health?
- What are the sources of stress?
- Is there a willingness to get help?
- How big of a problem is sleep deprivation and does shift work lead to sleep deprivation or other health risks?

3.2 Review of Current Health and Wellness Programs

All six emergency service organisations that we studied have a considerable number of health and wellness programs currently in place. We set out to collect and consolidate information on the programs being offered so that we could later identify gaps between needs and programs. Additionally, we hoped that consolidating the data would increase the organisations' awareness of each other's programs. This would facilitate the exchange of successful practices and provide possible opportunities for improvement. In order to do this, we conducted semi-structured interviews with the supervisors of the member organisations and group interviews with the emergency service workers themselves.

3.2.1 Supervisor Interviews

We conducted interviews with 20 supervisors, generally health and safety program managers, who are listed in Appendix C. They were recommended to us during the familiarisation interviews because they were the most knowledgeable about the programs and were also knowledgeable about the environment the workers were operating in. From these interviews with the supervisors we attempted to answer the following research questions:

- What wellness programs are currently in place?
- How do the programs operate and what are the costs and funding sources?
- What are the workers' attitudes towards the wellness programs?
- What are the current participation rates of the wellness programs?
- What percentage of the work force is over the age of 50 years?
- What are some of the effects of an ageing workforce?
- What is being done to mitigate the effects of ageing?
- How is the effectiveness of a wellness program judged?
- Which of their programs are effective?
- What improvements do the organisations want to make to their wellness programs?

These interviews also addressed health and wellness needs described in section 3.1. We used a semi-structured interview in order to provide guidance for the supervisors while still allowing them to discuss their concerns freely. The interview questions can be found in Appendix B. At the beginning of our interviews, we read a consent script to the interviewees. This explained what our project was about and what information we were looking to receive. It asked permission to use the interviewee's name, in addition to their title, and to record the interview. After permission was given, we recorded all of the interviews. We took notes

during the interviews and only used recordings to clarify discrepancies in our notes. We then combined our notes into interview summaries.

3.2.2 Group Interviews

While the interviews of the supervisors provided useful administrative information, we felt that it was important to get the workers' opinions of the programs, since they are the ones who utilise them. We hoped to answer the following research questions:

- What are the components of an effective wellness program?
- What methods will encourage high participation rates?
- What is the general opinion toward wellness programs?
- What improvements would the workers like to see made to their current wellness program?

The interviews also addressed questions about health and wellness needs described in section 3.1. In order to answer these questions we attempted to conduct group interviews of emergency service workers from each of the six organisations. The interview questions can be found in Appendix B. We selected a group interview because it would uncover issues and provide ideas that we had not thought about previously and allow the workers to express themselves more freely than a structured interview. Also they would be surrounded by their colleagues, so they could look to them for support on a point and speak more confidently about issues. However being in a group setting might have discouraged some of the workers from sharing openly. Our goal in doing this was to obtain the general consensus as well as a variety of opinions from the working population. The interviewees were given anonymity, and were read a similar consent script as the supervisors. These interviews were not recorded, but we took notes and combined them to make interview summaries.

We accompanied CFA and SES on one of their health monitoring visits to brigades. We used this as an opportunity to conduct group interviews and get their opinions on the health services that were being provided. For the remaining organisations, we attempted to conduct one interview per organisation that would allow approximately 10 of its workers to participate. We employed convenience sampling. The participants were chosen by their supervisors based on their availability at the time. We requested that the groups include career and volunteer workers of both genders and different age groups. A limitation of the supervisors choosing the workers to be interviewed could have been that they biased their selection towards people who were knowledgeable about the wellness programs. When group interviews were unattainable, we instead conducted more in depth interviews with one or two workers from each organisation.

We were unable to conduct worker interviews with Coast Guard and AV, due to availability and the organisation's research policies, respectively. We were also unable to conduct interviews with career workers for CFA and SES. In total, we interviewed approximately 30 emergency service workers. This is a very small number compared to the total number of

workers in these organisations. Therefore, the opinions that were given cannot be considered representative of the organisations.

3.3 Identification of Notable Practices, Gaps between Needs and Programs, and Possible Cross-Agency Collaboration.

Through our analysis of the health and wellness needs and program reviews we looked at several research questions in order to determine notable practices and gaps. These questions are as follows:

- Which programs are particularly thorough, well thought of, or unique?
- What needs do the programs seek to address?
- How well are the programs aligned with these needs?
- Are there any gaps between identified needs and current programs?

By using the information gathered from both the supervisor and group interviews, we created a program comparison table in order to identify similarities and differences among the organisations. This facilitated the identification of notable practices and gaps in each of the programs. Notable practices were defined as programs that are particularly thorough, well thought of, or unique. A thorough program was defined as one that addresses multiple needs well or fully addresses a single need. Well thought of programs were mentioned positively in both worker and supervisor interviews. Finally, unique programs were programs that only a few organisations offer, but could be beneficial to all organisations. Our goal was to determine how the wellness programs could be improved upon by drawing from the notable practices among the organisations. We then identified gaps in the organisations' programs by comparing the programs offered and determining how many needs the programs addressed. These gaps presented opportunities for improvement. Once the notable practices and gaps were identified, we were able to make preliminary recommendations.

Once we had most of our findings and had come up with some of our preliminary recommendations, we held a forum to discuss them with representatives of the six organisations. At the forum, we delivered a presentation on our findings and facilitated a discussion with the program experts, encouraging them to offer their reactions and make suggestions for possible improvements or additional recommendations. We had a set of questions to guide the experts in their responses, which is shown in appendix B. We hoped to hear from them whether our preliminary recommendations were applicable and feasible. We also hoped to promote discussion about similarities between organisations and possibilities for collaboration and improvement. With the information we gathered from the forum, we altered our recommendations and deliverables to include the organisations' opinions.

4.0 FINDINGS

In this chapter we present the information that we found through interviews, program documents, and statistical data and draw conclusions based on the analysis of this information. We first identify our findings on the patterns in health and wellness needs that extend to multiple agencies. We then provide a brief overview of what programs are available at each of the six organisations and point out commonalities among them. Next, we discuss practices which are notable because they are particularly thorough, highly thought of, or unique in their approach to improving health. Finally we illustrate gaps between needs and current programs. These findings will assist in showing the current state of health and wellness programs in the emergency services and aid in the framing of recommendations for their continuing improvement.

4.1 Health and Wellness Needs of Emergency Workers in Victoria

Our study has revealed that the needs of multiple agencies coincide. The most common health and wellness needs across emergency service workers can be divided into three categories: injury prevention and recovery, long term health, and psychological wellbeing. These common needs suggest opportunities for organisations to benefit from viewing the wellness programs of other organisations that address similar issues. Below we provide a summary of the needs that our study has uncovered.

Strains and sprains are the most frequently occurring injury. In almost every interview that was conducted, both the workers and the health and fitness supervisors reported that strain and sprain injuries were the most common physical problem. Workcover data collected between July 2009 and June 2010 by the Australian Fire and Emergency Services Authorities Council (AFAC), shows that strains and sprains are overwhelmingly the leading type of injury in MFB, CFA, and SES. Workcover data from VicPol also illustrates this trend, with more than half of the claims filed in the 2010-2011 financial year due to strain and sprain injuries. Mr Williams, a health promotion team leader at AV, noted strain and sprain injuries as a special concern as well, with back injuries being a serious issue within the paramedic service.

Both the worker groups and supervisors indicated that many of the duties required of a responder put them at risk of a musculoskeletal injury, either from sudden movements, awkward movements, or heavy lifting. Manual handling was cited by the Protecting our People health strategy documentation provided by VicPol as one of the most common causes of injury, as well as strenuous activities such as climbing, pursuing and restraining subjects, and gaining entry to structures. These injuries can present immediate dangers depending on the situation the worker is in when the injury occurs, as well as cause temporary reduced capacity and possibly permanent damage if the strain is severe or repeated.

All agencies share the need to promote workers' long term health through healthy lifestyle choices. These life style choices include healthy eating habits, smoking cessation, regular health checks, and maintaining an active lifestyle. Numerous supervisors and

workers reported that the lifestyle imposed by shift work increases the tendency of responders to consume fast food and other quickly or easily available meals. VicPol workers and AV supervisors cited this as a specific problem due to the requirement that employees “eat on post,” which means that they are not allotted time to go back to the station to eat while on shift, so they grab whatever is readily available. These meals are usually purchased from a vendor and tend to be less healthy than homemade food. The remaining organisations cited diet as a general concern due to its effect on workers’ long term health.

The limitation of smoking among workers was a stated goal of all organisations. Current estimates of the percentage of workers who smoke range between 7% and 14% depending on the organisation. While this is lower than the Victorian average of 20% as stated by AV, most organisations have indicated that smoking continues to be a concern. The chance of heart and lung damage is especially dangerous in an emergency worker due to the strenuous nature of their work. Many of the tasks they perform have heavy aerobic involvement or involve additional stressors such as entering smoke filled buildings.

Several interviews with health and fitness supervisors indicated that the early detection of cardiac risks is of particular importance. As previously mentioned, the duties that emergency service workers perform put large amounts of strain on their cardiovascular systems, which can lead to a heart attack or stroke while on duty. Supervisors see the need to detect long term issues at an early stage, when action can be taken to avert problems and avoid loss or removal from duty.

The amount of exercise workers get outside of work and their continued physical fitness was noted as a concern among all agencies. Maintaining an active lifestyle is important to keeping workers capable of performing their duties. Physical fitness is required for many tasks performed by responders and, with a few exceptions for specialist units, time to exercise while on shift is not generally available or sufficient to maintain the level that is required to perform these tasks. Physical condition is considered important enough to a worker’s ability to perform their duties that all career agencies test for fitness as part of recruitment.

Workers in all organisations share similar challenges in regards to their psychological well-being. Critical incident stress is the highest single cause of claims for psychological stress among SES, VicPol, and MFB workers, and critical incident stress was one of the highest concerns among the psychological experts of the agencies. Sometimes a single severe incident can produce trauma. These are commonly called critical incidents and coping with them is a concern for all first responders (O’Connell, 2003). Most agencies define critical incidents as incidents involving homicide, suicide, car accidents, large scale fatalities or casualties, or the sudden unexplained death of an infant. These are the incidents commonly linked to the occurrence of Post-Traumatic Stress Disorder. Additionally, repeatedly seeing others’ trauma day after day is known to induce stress and vicarious trauma in those who respond.

Our study revealed that workplace issues such as bullying, harassment, and lapses in maintaining professional boundaries are also a significant source of stress in most of the

organisations. In multiple interviews, workers, peers, and mental health professionals stressed that the emergency services is a job like any other, with similar workplace issues. For VicPol and MFB, workplace issues as a group account for almost half of the claims lodged in regards to psychological injury. These claims also tend to remain unresolved for longer, resulting in a larger number of days lost per claim. This problem was not mentioned as frequently among volunteer organisations, perhaps due to the more relaxed organisational structure of these organisations or because the workers do not spend much time together in a workplace environment outside of emergency response.

Different stressors include family issues, relationship issues, or work related issues. Shift work has been shown to cause difficulties in relationships and family life (Elliot, 2007) and this was supported through our interviews. Fire fighters and police officers both stated that shift work makes scheduling around work difficult. They also mentioned that it interferes with their eating and sleeping patterns. Their work may cause them to miss events with friends and family, straining relationships.

4.2 Review and Comparison of Programs

In this section we first describe programs that are similar among most or all of the organisations, highlighting some key differences. These programs are split into three categories: those that address injuries, long term health complications, and psychological issues. For each program category, we begin by presenting a comparison table that shows which organisations offer programs with particular elements. After comparing programs in these three categories, we conclude the section by providing a description of the approaches that each of the organisations take towards their wellness programs. This takes into account the culture of the organisations and what types of programs they focus on. Appendix D shows a complete listing of the programs with brief descriptions.

4.2.1 Programs that Address Injuries

Table 4: Health and Wellness Programs that Address Injury Prevention

	Program Elements						
	Recruit fitness assessment	Voluntary fitness assessment	Mandatory fitness assessments	Free/Discounted fitness facilities	Time allotted for exercise	Injury prevention training	Injury tracking
AV	●			●		●	●
VicPol	●	●	●	●		●	●
MFB	●	●		●	●	●	●
CFA (career)	●	●		●	●		●
CFA (volunteer)							●
SES							●
Coast Guard							●

Table 4 shows that all of the organisations have an injury reporting system. Injury reporting systems address injuries by assisting in preventing their reoccurrence. Managers can use the data from these systems to identify health trends and matters of concern, which can then be addressed in a wellness program. These systems can also inform the wellness program managers that a worker has been injured and may require rehabilitation, which facilitates reactive programs geared towards recovery.

VicPol has just automated their injury and near miss system which investigates all injuries in order to prevent future injuries, near misses or accidents. MFB's system, called REII, is available on their intranet. If a worker is going to make a claim then they must also fill in a Workcover claim form. Coast Guard utilises a paper form to report their injuries. AV reports their injuries to dispatch and CFA reports their injuries on the electronic CFA Safe system. SES has a new operational health and safety computer system, called Safegate, which contains a hazard and incident reporting system where workers can monitor the reports that they sent in to see if they are being addressed. Many organisations are moving towards online injury reporting systems. This allows for easier access, more statistical analysis, and prevents paper forms from being lost.

Several organisations indicated that physical conditioning can prevent injuries. The two career fire fighting agencies, CFA and MFB, have allocated time for their workers to exercise. This is a condition of the fire fighters' contracts and the time is assumed to be available between calls. Supervisors indicated that this system probably would not be applicable at other agencies with different operational patterns. Though VicPol does not have

allocated time for exercise, Table 4 shows that VicPol is the only organisation that requires mandatory fitness assessments. This will be discussed further in section 4.3.

4.2.2 Programs that Address Long Term Health

Table 5: Health and Wellness Programs that Address Long Term Health

	Program Elements						
	Basic health checks*	Detailed health checks**	Recruit medical assessment	Nutritional information	Smoking cessation	Discounts for health initiatives	Fitness competitions
AV	•		•	•	•	•	•
VicPol	•	•	•	•	•		•
MFB	•	•	•	•	•		•
CFA (career)	•	•	•	•	•		•
CFA (volunteer)	•			•	•		•
SES	•			•	•		•
Coast Guard							•

* These include blood pressure, cholesterol, BMI, glucose, and a risk assessment questionnaire.

** These include more tests beyond basic health checks.

As shown in Table 5, all of the organisations, with the exception of Coast Guard, offer nutritional and smoking cessation advice. This advice is usually shared through brochures and posters hung on notice boards. The majority of the organisations are smoke free at stations and some even have policies against smoking while near their response vehicles. MFB pays for half of the registration fee for a smoking cessation class. If the employee manages to quit smoking for three months, then MFB fully reimburses that employee's registration fee for that class. Other organisations have indicated that they would like to be able to reimburse persons for the costs that are incurred from quitting smoking, such as the cost for classes, packs of gum and patches.

From Table 5, it can be seen that all organisations participate in some form of fitness competition. All of the organisations participate in the Victorian Police and Emergency Services Games. These games are organised by VicPol but all emergency organisations are invited to participate. The Victorian Police and Emergency Services Games are an Olympic type event. In 2011, over 40 sports were offered. CFA also organises Championship Games which are open to all volunteer fire fighters. Besides participating in these games, some CFA brigades put on local fitness competitions, such as "Biggest Loser". This was a competition where brigades competed to see which could collectively lose the most weight.

Five of the six organisations utilise some form of voluntary, on-demand health check. For the volunteer agencies, these health checks are provided by ESV Healthwatch, which has been

used by over 4000 volunteers since its introduction in 2004. MFB and the career workers of CFA contract external programs, and MFB’s program is augmented by internal assessments and follow up programs. The MFB’s medical monitoring program reached approximately 700 people in 2010. VicPol uses an internal program to perform health checks. In theory the checks are compulsory every two years. However, there are not sufficient resources to mandate the checks. AV as of now uses only an external program. Several of these external programs are covered under WorkSafe Victoria’s Work Health Check program, assuring a consistent level of service is provided. At minimum, all programs include at least a blood pressure, cholesterol, and glucose level check; height, weight, and waist measurements; and an explanation of the results. Many programs accompany this with recommendations for future actions for employees to improve their health.

All career organisations (AV, CFA, MFB, and VicPol) have a variety of tests for their recruits. All of them include medical evaluations and fitness tests. The medical evaluations generally look for conditions that would render someone unable to perform their duties, rather than future health risks. The fitness assessments range in difficulty from a short set of push-ups and sit-ups to a complex series of duty based tests including a Beep Test, obstacles, and strenuous duty simulations. These tests are generally run by professionals internal to the organisation that is conducting the testing. VicPol repeats their recruitment testing, except for the swim test, as a regular required fitness test for new officers, which we explain in more detail in section 4.3.

4.2.3 Programs that Address Psychological Issues

Table 6: Health and Wellness Programs that Address Psychological Wellness

	Program Elements							
	Recruit psych. evaluation	Peer support	Internal psych. professional	External psych. professional	Chaplaincy	Critical incident response by peer	Critical incident response by professional	Psych. education
AV		●	●		●	●		
VicPol	●	●	●	●	●	●	●	●
MFB	●	●	●	●	●	●	●	●
CFA (career)	●	●		●	●	●	●	●
CFA (volunteer)		●		●	●	●	●	●
SES		●			●	●		
Coast Guard		●	●	●		●	●	●

As Table 6 shows, all organisations have peer support programs and use this as their first method to address psychological well-being. The peers are specially trained workers within

their organisations. They apply to receive training to help their co-workers through stress and traumatic incidents. They are generally described as individuals trained in listening. Peers may also provide referrals to a variety of services, including professional psychologists. All organisations have a method by which peers can respond to critical incidents. This can occur either while the incident is in progress or afterwards in the form of follow-up phone calls or emails. Chaplains are also a common psychological support among the agencies. They provide religious services and another form of counselling when needed.

4.2.4 Organisations' Approach to Wellness Programs

In this section, we look at each organisation individually and note unique aspects of their cultures and how this determines their approach to wellness programs along with the structure used to support those programs. We attempt to show what makes their wellness programs distinct from the others'.

AV

For some time, Ambulance Victoria has had a large focus on research, endeavouring to uncover the most pressing health and wellness needs in their organisation and which programs would be the most effective for them to implement. They recently undertook a complete health and wellness survey in preparation for an upgrade to their physical wellness programs. They have also taken the lead in program research and development in the past, creating the MANERS model for critical incident psychological support, which is now used by most agencies.

Ambulance Victoria has in place a fairly complete structure for implementing psychological wellness programs and is beginning to implement a physical wellness program. They have peer coordinators to provide support and direction to their peer structure and a dedicated unit of psychological professionals to work with and in addition to the peers. They have also recently created a position in the health and wellness section for a director who will be more specifically focused on physical wellness. They are currently developing new programs for health promotion.

VicPol

Victoria Police has recently changed its focus towards ensuring that its officers are physically fit and capable of performing their duties. In that regard, they have instituted one set of standards, regardless of age and gender, which need to be met on recruitment, and for new recruits, throughout their career. The tests conducted to determine if they meet these standards are duty based to ensure that workers can actually carry out policing duties.

Victoria Police has a People Health Department, which is headed by the Police Medical Officer. The department is organised distinctly into several branches which are also broken down further as shown in Figure 1.

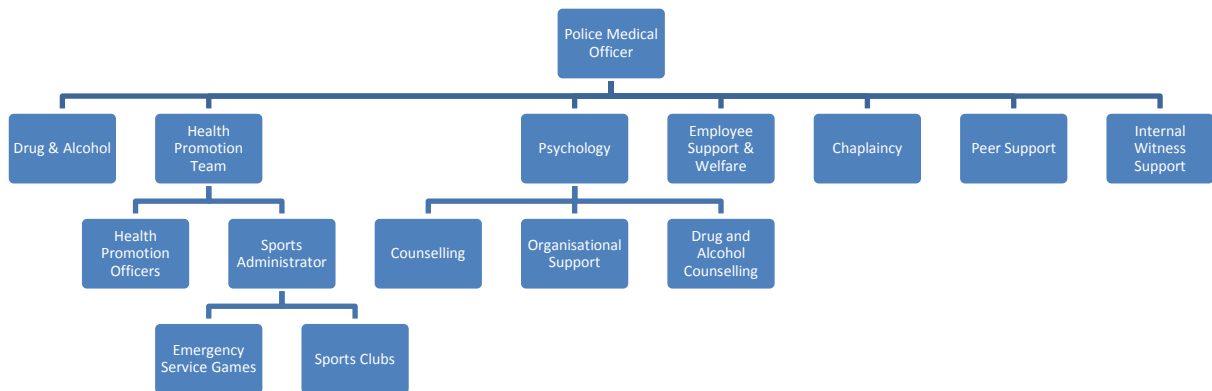


Figure 1: VicPol’s Wellness Hierarchy

VicPol’s psychological structure is unique in that they have a dedicated drug and alcohol counselling unit. Also, all of their physical wellness initiatives are placed in a single branch.

MFB

The Metropolitan Fire Brigade is focused on their ageing population of career fire fighters, and therefore maintaining the wellbeing of its members has become an increasing concern. The MFB has a dedicated health and wellness structure, which contains the OH&S, Workcover, rehabilitation, psychological support, health and fitness, and medical branches. These latter three create and implement the wellness programs, with the goal of increasing the resilience of the workforce. When a need is identified, a specific program is created to address it and it is assigned to the most appropriate grouping. This results in many small, targeted programs in several broad areas.

The trend towards smaller programs is especially true in the health and fitness area. Most of the large variety of programs, including the newer initiatives toward injury reduction, are implemented by the fitness leaders. Fitness leaders are specially trained fire fighters who assist in health and fitness initiatives. This is distinct from most organisations, where the majority of fitness programs are implemented by dedicated fitness professionals. Fitness leaders will be discussed in more detail in section 4.3. MFB’s health and wellness structure is not centralised, so workers can go to the six different branches of the health and wellness structure, mentioned above, and get different solutions to the same problem. One health and wellness manager indicated that this can result in a worker not being able to find the optimal solution, quickly or at all, for their issue. Since this issue was only mentioned by one person, it’s not clear whether it’s perceived to be a widespread problem.

CFA

Country Fire Authority is the largest and most geographically distributed of the six organisations in this study. There are a total of 1,222 CFA fire stations throughout the state of Victoria, with over 60,000 workers. CFA is unique among the organisations due to having a large number of volunteers along with career workers. CFA staff identified the size of their

organisation as a significant challenge in terms of being able to implement wellness programs that can go out to each brigade. Due to this, CFA tries to raise awareness so that members will take action independently to improve their health.

Dr Jane Wadsley, the Brigade Medical Officer of MFB, noted that the shortage of doctors in rural areas creates a problem where people do not have the access that they need to get proper medical attention. She mentioned that this is a large problem, especially for CFA, due to their wide geographic distribution. The shortage of medical care in rural areas directs CFA's focus on health checks for their volunteers. CFA has two independent wellness programs geared at long term health: Healthwatch for volunteers and Healthy for Life for career workers. Their structure consists of these two long term health programs along with psychological support that is offered to both types of workers.

SES

State Emergency Service consists almost entirely of volunteer workers. Its volunteer workers do not have an SES email, which makes it difficult to send out educational information. Instead it mails out an information sheet every two months that contains recipes, activities, and healthy tips. A goal for SES, mentioned by managers at SES, is to be more engaged with the volunteers and have a better form of promotion for its programs.

SES has recently developed a corporate structure that can implement wellness programs. It currently has multiple people working intermittently to improve health and wellness, but would like to have one person to focus solely on volunteer health.

Coast Guard

Coast Guard created its wellness unit two years ago and so the wellness programs are just in their infancy. Currently, it only offers psychological services. Coast Guard hopes to implement a physical component to its wellness program in the future.

4.3 Notable Practices in Health and Wellness Programs

Among the programs we reviewed, there are several that distinguish themselves as being particularly thorough, highly thought of, or unique in their approach to improving health. These programs represent efforts that may be desirable to replicate or take note of when addressing similar problems or seeking to modify similar programs. These efforts are divided by their focus into the three major health concerns: injuries, long term health, and psychological wellbeing.

4.3.1 Injury Reduction Efforts

Manual Handling Training and Back to Basics

Ambulance Victoria's approach to wellness is unique because it is one of the few organisations that have programs in place specifically to prevent injuries. Its two injury

prevention programs are Manual Handling Training and Back to Basics training. Manual Handling Training is a mandatory program that is offered every two years. It is aimed towards lowering the incidences of back injuries by training workers in proper lifting techniques.

Back to Basics is a rolling training course, also on a two year interval, which is designed to introduce workers to new equipment and ways to avoid brute strength lifting. Training material is also available online. AV is in the process of gathering data to assess the effectiveness of these relatively new programs.

Core Conditioning Program and Functional Strength Training Program

The Core Conditioning Program is a three week posture and flexibility program that is unique because it is the only program aimed at preventing injuries, especially back injuries, through exercise. The goal of the program is to increase a fire fighter's resistance to injury by implementing specific exercises and teaching participants to activate their core muscles to reduce the occurrence and impact of musculoskeletal back injuries. There are a variety of exercises to be performed, progressing in complexity and difficulty as the program advances. Some of the exercises performed are: pelvic tilts, 90 degree hold, heel touches, kneeling abs, gluteal stretch, hover, push-ups, bridge, side double leg lift and squats. In the final week, a fitness ball is included to increase the difficulty of the exercises.

The Functional Strength Training Program aims to improve fire fighting capacity in seven Functional Movement Patterns in order to increase physical resilience and decrease the chance of sustaining an injury. This program has just commenced at stations. Both programs are promoted through email, the MFB intranet, and through the fitness leaders.

Safegate

Safegate is an online occupational health and safety system utilised by SES. It was developed to be very user friendly. It has a virtual assistant for less confident readers and all input is through simple dropdown menus. Its main purpose is for volunteers to note hazards and incidents and pass them up the chain for consideration, with the option to bypass their immediate supervisor if it involves that supervisor.

Supervisors have said that Safegate has received a very positive response during the month and half it has been active. This response includes high usage compared to the previous system and good feedback. One reason that Safegate is popular is because the volunteers can monitor the progress of their claims. According to staff we interviewed, there have been no reports of difficulty using the computerised system and they have not yet had a problem with frivolous claims being logged. When it is completed, Safegate will contain analysis tools for managers that will help them identify common injury causes, helping to prevent further injuries.

4.3.2 Long Term Health Promotion Programs

Emergency Service Volunteer (ESV) Healthwatch

ESV Healthwatch was started by CFA in 2004. It is a program that offers health checks to volunteers. The Healthwatch team makes visits to the brigades across the state. It is available to volunteers of four organisations: CFA, SES, Coast Guard and Lifesaving Victoria, but it is not mandatory. The program is promoted through mailings, but is primarily advocated by the captain of each brigade. Anna Ruzic, a Healthwatch staff member, stated in the forum with the health and wellness supervisors that this top-down approach is very effective for spreading information and encouraging participation. During the health check, there are three stations which together assess a worker's cardiovascular risk. The program includes: blood pressure, cholesterol and glucose testing; height, weight and waist measurements; and a review of their results. The results for each participant are entered into a system, called ESV Heart Track Online, which creates the participant's health profile. Workers are then given personalised recommendations to improve their health. Participants are given access to ESV Heart Track Online so that they can access their results anytime. The participants are also given handouts that contain tips for developing a healthy lifestyle. To date, over 4000 participants have received health checks from Healthwatch.

Mandatory Duty Based Fitness Testing

As of July 2010, all VicPol occupational staff members hired after that date are required to undergo and pass a physical fitness test every six months. This is the only mandatory fitness testing in the six emergency services in Victoria after recruitment. This testing occurs on the same day of their Operational Safety and Tactical Training (OSTT) which focuses on crucial skills such as shooting. The fitness test is made up of a set of duty based tasks. These tasks are: handgrip dynamometer test, Illinois agility run, Beep (Shuttle) Test, push-ups, prone bridge (plank), and obstacle climb. There are certain standards to be attained in order to pass these tests and these standards are the same regardless of age and gender. This is the same test required for recruitment with the removal of the 100m swim test, ensuring consistent physical condition throughout employment. Participants who fail this test are given assistance to increase their fitness. If the employee continues to fail the tests it is within the organisation's right to terminate the employee. Since this is a new requirement, none of the staff have participated in this new mandatory program as of yet. The workers we interviewed at VicPol welcomed the introduction of this program as they felt that it was important for all officers to be physically capable of performing their duties.

Healthy for Life

The Healthy for Life program is a set of programs that focus on long term health and fitness. It is only available to CFA career workers and is completely voluntary. Healthy for Life offers health assessments, fitness assessments, seminars and exercise programs and is run by an external company.

- The health assessment includes blood pressure, oxygen saturation, energy consumption and expenditure, blood cholesterol, blood glucose, and heart rate testing, as well as height, weight, and waist measurements and body fat percentage estimates. A personalised plan is created to address any areas of concern.
- The fitness assessment includes: hand grip dynamometer, sit and reach, push-up, sit-up, prone bracing, VO2 shuttle run, and Astrand bike or Gerkin treadmill tests. The results are compared to American College of Sports Medicine (ACSM) standards. Individualised exercise programs and an analysis of progressive results are given to the participant.
- The exercise classes offered are Pilates; Circuit; Be-fit; Stretch and Relaxation; Tummy, Hips, and Thighs; Cardio-fit; and Fit-ball.
- The education seminars offered are cancer awareness, healthy heart and cardiovascular disease, nutrition, diabetes, and Eat well, Live well.
- The gym equipment is also assessed regularly and a report is given to their OH&S department.

Fitness Leaders

The MFB Fitness Leader program is unique because they have operational staff acting as “fitness peers”. It was developed to provide operational personnel with readily available access to qualified on-shift health and fitness advisors and assist with the full implementation of the MFB Active Program. The fitness leaders are occupational staff who have been trained in fitness. The position is voluntary and they must go through an application process. The fitness leaders also undergo a skills maintenance program.

The primary roles of the fitness leaders are to implement the programs developed by the Health and Fitness Unit and to serve as a resource for their co-workers in health and fitness matters. Documentation from the MFB states that the fitness leader program is beneficial because it give fire fighters a fitness resource which is constantly available to them at the station. FEMA also suggests that peer fitness leaders can facilitate the implementation of programs (FEMA, 2009). The fitness leaders help to implement the following: Functional Strength Training Program, Core Conditioning Program, Nutrition and Weight Maintenance Program, MFB Fitness Assessment Program, and Injury Follow-up and Management.

4.3.3 Psychological Support Initiatives

AV Peer Support Program

AV has a well-respected peer program. Peer Coordinating Officers from VicPol and MFB have acknowledged the high quality of work done by AV’s peer system. The peers are supported by a full time staff and have structured assessment systems to guide their responses. The peers are a mix of staff and volunteers and offer their services to both career and volunteer workers. There are 70-80 peers throughout the state. AV’s peer program has several features unique to it such as: dejecting cases, having the dispatch unit alert the peers of critical incidents, having a peer response vehicle, and developing several initiatives such as

the MANERS model for addressing critical incident stress. Dejecting cases is the process of searching through the call logs for critical incidents, looking for traumatic ones. Having response vehicles allows the peers to provide a 24 hour mobile support group that can respond to major incidents and make visits to staff at times and locations convenient to the staff. The peers contact personnel after they have been to a traumatic incident.

VicPol Welfare Department

The role of Employee Support and Welfare is to provide a confidential support, information, advice and referral service to all VicPol employees. The Welfare Unit is made up of six sworn officers and one public servant, each of whom has been with VicPol for at least 10 years. They provide a 24 hour phone service of support and referral, which is available to sworn and unsworn employees along with their immediate family. The support service is unique because it provides a bridge between special services and policemen, referring workers to the resource that could best assist them. It is often used for personal or work problems. Workers can talk to someone that they can relate to, and if needed, can be referred to a professional. Counselling is provided by an external company and so it is available to the country stations as well as the metropolitan ones. Sergeant Park of VicPol's Welfare Unit describes the unit as trying to be "everything to everyone". They perform all the same roles as peers but have more training and resources available to them and welfare is their full-time job. Welfare officers are trained in suicide counselling. They keep track of critical incidents and try to attend more serious critical incidents. They also make hospital visits, offer support to suspended employees, and assist employees who are sick or injured. In 2010, the Welfare Unit made contact with over 1,700 employees.

4.4 Gaps between Needs and Available Programs

While conducting our review, we noted that the most pressing health and wellness needs are well addressed within the agencies. However, in certain instances we observed that there are opportunities for improvement in the handling of certain needs. This section points out five opportunities for improvement in injury prevention, fitness assessments, health risk monitoring, addressing workplace issues, and the evaluation of a program's effectiveness.

Most agencies do not have a program that helps in preventing sprain and strain injuries. As mentioned previously, we found that sprains and strains are the most common injuries among emergency service workers. However, only AV and MFB currently offer programs that are proactive in addressing these injuries by trying to prevent them. The other organisations instead offer reactive programs, which often consist of rehabilitation and health cost compensations. These are beneficial for workers in order to help them during their recovery, but do not prevent the injury from occurring in the first place. As a result, costs are incurred from the injury and the reactive program, instead of just the proactive program. A study by Sott (2005) showed that costs for Workcover, rehabilitation, and for another worker to fill the shift can be cut as injuries are prevented through a proactive wellness program.

Most agencies do not have a program that ensures that the responders are physically capable of performing their duties. Fitness for duty assessments help to ensure that workers are able to do their jobs. This helps to prevent injuries and other accidents as well as ensuring job performance. Unfortunately, all of the supervisors that we talked to stressed that these assessments are very hard to implement without affecting employment security. They also pointed out that this is a very sensitive topic, especially for career workers. There are ways to make this policy less threatening to the workers. As described earlier, VicPol was able to implement such a policy and make it mandatory for new employees. This type of health initiative keeps workers conscious of their current health and fitness, which likely to inspire healthier behaviour. Most organisations already have fitness for duty assessments, but these are mostly used for injured workers to see if they are ready to come back to work.

Heart health could be more closely monitored in high risk groups. Monitoring heart health is another sensitive subject with regards to job security. Heart health was described by supervisors and workers in most of the organisations as an important condition to monitor. Heart diseases can lead to fatalities, which are the leading cause of death in Australia according to documentation provided by ESV Healthwatch. Monitoring heart health only takes about a half an hour and requires no extra time in between testing.

Bullying, harassment, and workplace environment stress claims could be more specifically targeted. Most of the organisations said that many of their psychological issues stem from workplace environment. Workcover data on MFB and VicPol's psychological claims showed that this was almost as big of a problem as critical incident stress and PTSD, as mentioned earlier in section 4.1. Since this is such a large problem, representatives from multiple agencies stated that it would be beneficial to put a greater focus on it. Most organisations have enough people to go to when there is a problem; however, this can sometimes be too late by the time a worker decides to ask for help. Sue Jamieson, the Employee Assistance Coordinator from MFB, wants to implement programs that are proactive in specifically targeting workplace stress. She would like this type of program to teach workers about professional behaviours. This would include regular seminars on professional boundaries and professional behaviour. She additionally stated that the culture in emergency services, which can include large amounts of jokes at others' expense, can readily lead to situations where unprofessional conduct could arise.

Most agencies do not have specific criteria to evaluate the effectiveness of their programs. Throughout this project, we attempted to develop a view of how effective certain programs were. However, in our discussions with supervisors, we found that most organisations have very few ways of determining how effective their programs are. The most common method for tracking effectiveness of programs is through usage rates. While usage rates do give an idea of what level of exposure the organisation has had to the program, they do not indicate what effect the program has had on those who used it. From the forum, we learned that some organisations administer satisfaction surveys for certain programs. VicPol also began a more directed tracking of Workcover data after implementing a wellness strategy, but over all there is no way to track which programs are actually having an effect on

worker health. Sergeant Martin Park of VicPol's Employee Support and Welfare Services mentioned that the inability to evaluate a program's effectiveness presents a problem when decisions are being made as to which programs to fund.

5.0 RECOMMENDATIONS

This study assessed the health and wellness needs of emergency service workers in Victoria and reviewed programs currently in place. We discovered that the six organisations have a wide variety of programs that are addressing many needs, but also have some gaps between needs and programs. In this chapter, we begin with recommendations that address the gaps that were identified in the previous chapter and conclude with additional recommendations for areas that are covered but still have opportunities for improvement. We presented preliminary recommendations to a forum of health and wellness personnel and incorporated their feedback into the recommendations that follow.

5.1 Recommendations to Close Gaps between Needs and Programs

In the previous chapter, we identified gaps between health and wellness needs and current programs. Our interviews showed that there are few programs that aim to prevent musculoskeletal injuries, ensure that the workers are physically fit for duty, closely monitor heart health in high risk groups, or specifically target workplace stress claims. Additionally, there are few ways to determine the effectiveness of programs. These areas provide opportunity for improvement in most or all of the organisations. In this section we present recommendations that address the gaps that were identified, with examples or explanations of possible ways to implement them.

Implement injury and stress preventative programs.

Implementing injury prevention programs that are proactive could help to reduce claims based on strains and sprains, rather than reactive which ease recovery after an injury has occurred. Injury preventative fitness programs can include weight lifting and flexibility training such as yoga. A study done by Dr James Hilyer in 1990 showed that flexibility, though it did not decrease the number of injuries, did decrease the cost of time lost due to injuries. The decrease in time lost was statistically significant and suggests that the injuries were less severe or that the people who were more flexible were able to recover faster (Hilyer, 1990).

Jack Kanner suggests that a regular lifting training course could help to prevent sprain and strain injuries due to heavy lifting (Kanner, 1991). An example of a lifting training program that is proactive against injuries is AV's Back to Basics training. Implementing lifting training programs could be an opportunity for improvement for the other five organisations.

Additionally, some examples of proactive programs that prevent workplace stress are seminars on proper workplace boundaries and workplace behaviour. MFB currently offers this kind of seminar. The seminars are voluntary and can be requested by stations or departments. Rod Eggleston, a peer coordinator for MFB, stated that a mandatory seminar on professional conduct could be interpreted by workers as punishment. Making the seminars voluntary removes this perception, while still reinforcing professional conduct and increasing

awareness. Sue Jamieson, Employee Assistance Coordinator of MFB, indicated that these seminars are helpful in targeting workplace problems.

Workplace stress is not the only type of stress that can be addressed in a proactive manner. At the forum, SES supervisor Elizabeth Mulhall mentioned the idea of creative or passive activities, such as yoga or art classes, to give workers time to relax and relieve stress. This idea was also presented to SES workers in a survey, and Elizabeth reported that 70% of the respondents said that they would be interested in this type of activity if it occurred on the weekend.

Emphasise heart health checks, especially for at risk workers.

Emphasising heart health checks will allow workers to better monitor their health and be aware of their risk for heart disease. The ageing of the workforce places the average worker at increased risk for conditions aggravated by age or other sources of cumulative damage, such as smoking. These conditions include many cardiovascular problems that can be detected by regular screening. Both supervisors and workers indicated that health checks would be especially beneficial for at risk workers, for example smokers or those over the age of 50. Dr Jane Wadsley, the Brigade Medical Officer for the MFB, suggested that regular scheduled visits to stations would produce a higher uptake for medical monitoring programs than the current system in which brigades or individuals schedule their own checks. This would make health checks more convenient and accessible to those who normally would not set up their own appointment.

Consider approaches to mandatory duty based fitness testing and medical checks.

Previously we mentioned that mandatory duty based fitness or health testing is hard to implement, but there are methods to make these assessments less threatening to workers. One aspect of VicPol's new mandatory fitness assessment that is less threatening to the workers is that only incoming recruits sign a contract saying that they have to pass these fitness tests. Thus, current career workers are not in jeopardy of losing their jobs because of something that they did not originally sign on for. Most organisations have duty based fitness assessments for recruits which could be used or reformatted to regularly test current workers. Vancouver Fire Department lessens job security concerns by mandating fitness assessments, but without set standards that must be achieved. Workers' performance is instead compared to their own performance in previous years (Sott, 2005).

If organisations were to implement programs similar to VicPol's mandatory fitness for duty assessments, but with mandatory health checks, they could promote good health to all workers. Supervisors and workers from several of our interviews indicated that workers who may not pay particular attention to their health tend to shy away from medical checks, placing them at risk for undetected conditions. Mandatory health checks would eliminate this tendency. Based on interviews concerning the MFB's medical checks, medical monitoring programs are significantly less threatening if they are conducted by an outside agency and the results are not reported back to their superiors. This creates an increase in awareness without creating job security concerns. The fire department in Vancouver, Washington, which

requires its employees to have mandatory annual health screenings, stated that a lack of confidentiality creates job security concerns. With the exception of respiratory fitness for duty testing results, all information gathered from their testing is kept confidential from the department. Vancouver's testing also varies in how extensive the exams are. Extensive medical testing occurs more frequently for people over 40 or with a history of medical problems (Sott, 2005)

Offer incentives for meeting fitness profile or getting a health check.

If mandatory fitness or health assessments are not viable or are unfavourable, offering incentives could increase participation rates. Some examples given by workers in group interviews and the report by FEMA included offering a cash bonus, shift choice, recognition award, or other such prizes for meeting or surpassing a fitness profile. Additionally, workers and FEMA cited that competition can be an effective motivator for participation in programs.

Detecting health risks might be enough motivation for some workers to get health checks, but examples of incentives for health checks would be smaller prizes than given for meeting a fitness profile, such as raffles. Healthwatch adds a social aspect to their health checks by having a catered dinner afterward. These health checks were said to be most beneficial if there is a one on one discussion of results and simple actions that can be taken to reduce heart risks.

Discussion from the forum revealed concerns that incentives are not effective at reaching at risk workers. Several supervisors predicted that incentives would only benefit people who are already healthy. More studies may be required to discover an effective way to implement incentives that reach at risk workers.

5.2 Additional Recommendations

During our interviews, we came across other areas that do not address the gaps that were pointed out, but could result in an improvement in employee health. Most of these recommendations were either ideas of people that we interviewed or program aspects that were implemented by a single organisation. Other organisations might be able to benefit from implementing these programs also.

Support club sports more.

Supporting club sports and encouraging them to meet regularly can provide a social aspect which might limit the incidence of some workplace problems and reduce stress, while also providing exercise. This concept was very popular among workers who were interviewed. Cameron Williams of AV mentioned that it was possible for certain clubs to get corporate sponsorship, resulting in free or reduced price equipment and increasing participation. Workers at MFB and VicPol stated that some of their clubs raise money for charitable causes, which could increase interest in the club.

Offer discounts to gyms and healthy food.

Discounts or subsidies for gyms and healthy food were noted in the group interviews to be very good motivators for healthy living. The discounts for gyms also help if an organisation decides to mandate a fitness test, as it gives workers a method to keep up their fitness. Many workers who have access to fitness facilities on site noted that these were not always beneficial to maintaining or improving their fitness as their work outs were often interrupted by emergencies. Also many of the supervisors said that workers lived too far away from stations to come in to use the facilities when they were not already on duty. Group interviews indicated that it is important to work out off duty to maintain fitness, and discounted gym memberships would help to achieve this. However, discussion at the forum indicated that it is not known whether or not corporations are liable for workers who are injured while exercising off duty at an offsite gym that they were given subsidised membership to. An investigation conducted to establish limits to liability in this situation would help to clarify this.

Both supervisors and workers noted that shift work interrupts regular eating habits. Often workers do not have enough time to eat a meal or only have time to purchase unhealthy foods, such as fast foods or take away. AV provides discounts for Subway, for example, so that workers are more likely to eat healthily while on shift. On a related note, they are also looking into making an application for smart phones that compares the nutritional content of different foods, which will hopefully lead workers to make healthier choices while eating on and off the job.

Increase collaboration between organisations.

Lastly, we conclude that an increased collaboration between all organisations on similar health and wellness challenges and initiatives would be beneficial for the improvement of wellness programs. In our familiarisation interviews, each organisation mentioned that they wanted to know what the other organisations were doing in the line of health and wellness programs. If the organisations meet regularly, then they can share ideas and improve each other's programs. This occurred previously, through the Victorian Emergency Services Peer Association (VESPA). VESPA is an association involving the providers of the peer support programs of each agency that meets quarterly to discuss practices and share information.

To facilitate collaboration, we would like to propose a regularly occurring forum entitled the Victorian Emergency Services Health and Wellness Forum. Biannual meetings of the health and wellness personnel of the agencies could be facilitated by ESF. Many of those who came to the forum that we held expressed great interest in learning more about each other's programs. The flow of information between organisations had already begun before the forum was over. Some topics that could be focuses of future meetings are methods to measure the effectiveness of individual programs and methods of addressing drugs and alcohol issues. These issues were raised in our forum with the health and wellness managers. An opening for the first conversation could be thoughts on the criteria to evaluate wellness programs presented in our literature review in section 2.3.3. We hope that this collaborative group could use our project as a launching point for future endeavours.

REFERENCES

- ABC News. (2011) *Flood costs tipped to top \$30b*. Retrieved March 2, 2011, from <http://www.abc.net.au/news/stories/2011/01/18/3115815.htm>
- Ambulance Victoria. *Careers*. (n.d)Retrieved February 27, 2011, from <http://www.ambulance.vic.gov.au/Ambulance-Victoria/Careers/Jobs-at-Ambulance-Victoria.html>
- Australian Bureau of Statistics. (2010). *Population by age and sex, regions of Australia, 2009*. Retrieved February 2, 2011, from <http://www.abs.gov.au/ausstats/abs@.nsf/Products/3235.0~2009~Main+Features~Victoria?OpenDocument>
- Australian Government Department of Transport and Regional Services. *Natural disasters in Australia*. (2002). Retrieved February 26,2011 from [http://www.ag.gov.au/www/emaweb/rwpattach.nsf/VAP/\(99292794923AE8E7CBABC6FB71541EE1\)~Natural+Disasters+in+Australia++Review.pdf/\\$file/Natural+Disasters+in+Australia++Review.pdf](http://www.ag.gov.au/www/emaweb/rwpattach.nsf/VAP/(99292794923AE8E7CBABC6FB71541EE1)~Natural+Disasters+in+Australia++Review.pdf/$file/Natural+Disasters+in+Australia++Review.pdf)
- Bates, J. (2009). *Health risk assessment and the workplace wellness program*. Retrieved March 1, 2011, from http://www.wellnessproposals.com/wellness_articles/health_risk_assessment_and_the_workplace_wellness_program.htm
- Beaton, R. D., & Murphy, S. A. (2003). Sources of occupational stress among firefighters and paramedics and correlations with job-related outcomes p.140-150. *Prehospital and Emergency Medicine*. Retrieved February 18,2011 from <http://www.ncbi.nlm.nih.gov/pubmed/10155458>
- Berg, B. L. (2007). *Qualitative research methods for the social sciences* (6th ed.). Boston, MA: Allyn & Bacon.
- Burton, G. (2007). How the United States is reducing its firefighter fatalities. *The Australian Journal of Emergency Management*, 22(2),p.37-43. Retrieved February 18,2011 from

[http://www.ema.gov.au/www/emaweb/rwpattach.nsf/VAP/\(3273BD3F76A7A5DEDAE36942A54D7D90\)~vol22no2HowtheUS.pdf/\\$file/vol22no2HowtheUS.pdf](http://www.ema.gov.au/www/emaweb/rwpattach.nsf/VAP/(3273BD3F76A7A5DEDAE36942A54D7D90)~vol22no2HowtheUS.pdf/$file/vol22no2HowtheUS.pdf)

CBS News. (2011) *Australia flood nightmare only getting worse*. Retrieved January 24, 2011, from <http://www.cbsnews.com/stories/2011/01/24/world/main7276911.shtml>

CFA. *About Ash Wednesday*. (n.d) Retrieved January 23, 2011, from http://www.cfa.vic.gov.au/about/history/about_ash_wednesday.htm

Country Fire Authority. (n.d) *Fitness and challenge test*. Retrieved February 18, 2011, from http://www.cfa.vic.gov.au/volunteerandcareer/career_ff/fitness_and_challenge.htm

Country Fire Authority. (n.d) *What we do*. Retrieved February 18, 2011, from <http://www.cfa.vic.gov.au/about/whatwedo.htm>

Country Fire Authority. (2011). *Healthwatch program flyer*. Retrieved February 18, 2011, from <http://www.esvhealthwatch.vic.gov.au/node/127>

CSIRO, Australian Bureau of Meteorology. (2007). *Climate change in Australia: technical report 2007*. CSIRO.

Definition of Wellness. (n.d) *Definition of wellness*. Retrieved February 27, 2011, from <http://www.definitionofwellness.com/index.html>

Elliot, D. L., & Kuehl, K. S. (2007) *Effects of sleep deprivation on fire fighters and EMS responders*. Retrieved January 24, 2011 from http://www.iafc.org/associations/4685/files/progsSleep_SleepDeprivationReport.pdf

Emergency Services Foundation. (n.d) *Emergency Services Foundation*. Retrieved January 17, 2011, from <http://www.esf.com.au/index.htm>

Emergency Management for Schools. (n.d) *Get the facts*. Retrieved February 1, 2011, from http://www.ema.gov.au/www/ema/schools.nsf/Page/Get_The_Facts

Emergency Services Foundation. *Emergency Services Foundation Alumni newsletter*. (2010). Retrieved January 18, 2011, from <http://www.esf.com.au/documents/esf-alumni-ed4-jun2010.pdf>

Federal Emergency Management Agency. (2009). *Health and wellness guide (FA-321)*. Retrieved February 18, 2011 from <http://www.nvfc.org/files/documents/HealthWellnessGuide-2009.pdf>.

Hilyer, James C. et al. (1990). A flexibility intervention to reduce the incidence and severity of joint injuries among municipal firefighters. *Journal of Occupational Medicine*, 32(7), p.631-637.

Kanner, J. S. (1991). Preventing disability losses in emergency services. *Risk Management*, 38, p.48 (4). Retrieved from http://find.galegroup.com/gtx/infomark.do?&contentSet=IAC-Documents&type=retrieve&tabID=T002&prodId=AONE&docId=A10523458&source=gale&srcprod=AONE&userGroupName=mlin_c_worpoly&version=1.0

Lapum, D. (2003). The maintenance of police officer health through a mandatory wellness program. [Unpublished manuscript].

Lee, D. J., Fleming, L. E., Gomez-Marin, O., & LeBlanc, W. (2004). Risk of hospitalization among firefighters: The national health interview survey, 1986-1994. *American Journal of Public Health*, 94(11), p.1938-1939. doi:10.2105/AJPH.94.11.1938

Maguire, B. J., Hunting, K. L., Smith, G. S., & Levick, N. R. (2002). Occupational fatalities in emergency medical services: A hidden crisis. *Annals of Emergency Medicine*, 40(6), p.625-632. doi:DOI: 10.1067/mem.2002.128681

Maia, Â. Â. (2010). The psychological impact of motor vehicle accidents on emergency service workers. *European Journal of Emergency Medicine*, 17(5), p.296-301.

McLennan, J. (2008). *Issues facing Australian volunteer-based emergency service organisations:2008-2010*. Retrieved February 27, 2011 from [http://www.ema.gov.au/www/emaweb/rwpattach.nsf/VAP/\(9A5D88DBA63D32A661E6369859739356\)~Literature+Review+--+EM+Volunteers+-](http://www.ema.gov.au/www/emaweb/rwpattach.nsf/VAP/(9A5D88DBA63D32A661E6369859739356)~Literature+Review+--+EM+Volunteers+-)

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+FINAL+REPORT.PDF

Metropolitan Fire and Emergency Services Board. (2009). *About the MFB*. Retrieved February 18, 2011, from <http://www.mfb.vic.gov.au/About-Us/About-the-MFB.html>

Neates, M. (2009, June 20). Fit for LIFE at the western Australia police. *The Gazette*, 72 No. 1

O'Connell, K. A. (2003, April 1). Helping local heroes. *American City & County*, 4.

PreventionWeb. (2011). *Australia- disaster statistics*. Retrieved March 2, 2011, from <http://www.preventionweb.net/english/countries/statistics/?cid=9>

Reichard, A.,A., & Jackson, L.,L. (2010). Occupational injuries among emergency responders. *American Journal of Industrial Medicine*, 53(1), p.1-11.

Changingminds.org. (2002) *Sampling* .Retrieved February 14, 2011, from <http://changingminds.org/explanations/research/sampling/sampling.htm>

Sapienza, J. (2009, Nov. 26). Australia scorched by 50,000 bushfires a year. *WA Today*, Retrieved from <http://www.watoday.com.au/wa-news/australia-scorched-by-50000-bushfires-a-year-report-20091126-jtfs.html>

Scanlon, P., & Ablah, E. (2008). Self-reported cardiac risks and interest in risk modification among volunteer firefighters: A survey-based study. *Journal of the American Osteopathic Association*, 108(12), p.694-698.

Skwirk. *Natural hazards*. Retrieved February 1, 2011, from http://www.skwirk.com.au/p-t_s-57_u-479_t-1306/natural-hazards/qld/sose:-geography/disasters

Sott, T. (2005). *Evaluation of firefighter health and wellness programs*. Retrieved January 21, 2011 from <http://www.usfa.dhs.gov/pdf/efop/efo38040.pdf>

U.S Fire Administration. (2010). *Firefighter fatalities in the united states in 2009*. (Program Status Report No. 23).FEMA. Retrieved January 21, 2011 from http://www.usfa.dhs.gov/downloads/pdf/publications/ff_fat09.pdf

Victoria Police. (2009). *About victoria police*. Retrieved February 18, 2011, from http://www.police.vic.gov.au/content.asp?Document_ID=3

Victoria State Emergency Service. (n.d) *Who we are*. Retrieved February 18, 2011, from <http://www.ses.vic.gov.au/CA256AEA002F0EC7/page/Who+We+Are?OpenDocument&1=10-Who+We+Are~&2=~&3=~>

Wikipedia. (n.d) Black Saturday BushFires. Retrieved January 21, 2011 from http://en.wikipedia.org/wiki/Black_Saturday_bushfires

Winter, F. D., Seals, N., Martin, J., & Russell, B. (2010). *Implementation of the first wellness-fitness evaluation for the Dallas fire-rescue department* Retrieved February 11,2011 from http://find.galegroup.com/gtx/infomark.do?&contentSet=IAC-Documents&type=retrieve&tabID=T002&prodId=AONE&docId=A230765627&source=gale&srcprod=AONE&userGroupName=mmlin_c_worpoly&version=1.0

Appendix A: Desired or Implemented Worldwide Wellness Programs

	Sacramento Fire Department	St. Paul Minnesota Police Department	Wayne County Sheriff's Department	Vancouver Fire Department	Western Australia Police
Mental Health Evaluations	Annual	NR	Regular, mandatory	NR	NR
Fitness & Medical Evaluations	Annual and before implementing fitness program	Both, on demand	Regular, mandatory medical	Annual medical screenings dependent on age, extra medical testing for at risk workers, annual cancer screening	Voluntary one on one medical assessment and full blood screening every two years
Fitness Equipment	Cardiovascular and resistance machines and free weights; training so that equipment is not used incorrectly	Treadmills, aerobicycles, stair climbers, resistance machines, and free weights	Wants to implement something similar to what St. Paul Department has	Treadmills, bikes, stair climbers, multi-station weight machine, and free weights. Peer fitness training to help the workers exercise properly	Supply and maintain equipment, provide support and instruction for use
Fitness Programs	Make sure that programs are performed correctly and are safe	Aerobic classes offered three times a week	Wants to implement something similar to what St. Paul Department has	Mandatory 1 hour exercise each shift but is not punitive and can choose at what level they work out	Partnership with WA Police Sports Federation to support 10 sporting teams
Nutrition Education	Targeted education from nutritional and physiological experts to help prevent health issues that stem from poor diets	Weight loss and cholesterol control education	Education on dietary habits to prevent obesity, heart disease, diabetes, and cancer	One on one counselling sessions, educate 20-29 and over 50 year olds about nutrition and exercising, make a video about nutrition and exercise	Healthy cooking workshops, vending machine policy, and nutritional guidelines
Behavioural Modification	Encourage fire fighters to recover from risk taking activities when off duty	Smoking cessation and blood pressure management	Stress and financial management; tobacco, alcohol, and drug prevention and cessation	Policy to stop smoking	Stress management seminars, online website with information on improving health

Red coloured writing denotes a program which has already been implemented

All other programs, written in black, are desired and have not been implemented by the time they were reported on.

NR denotes no record of the information in the reports.

(Lapum 2003), (Sott 2005), (Neates 2009), and (Perry 2008)

Appendix B: Pool of Interview Questions

Familiarisation Interview Questions

1. Can you tell us more specifically about your/your department's role within your organisations?
2. How do you think that your organisation differs from the other five?
3. What health and wellness programs are available? Who is in charge?
4. What data is available on injuries, fatalities, and program usage?
5. What is your organisation hoping to gain from our project?
6. Can you recommend some persons who can tell us more about the wellness programs?

Supervisor Interviews

1. How would you describe the health and wellness needs of your organisation?
2. How much of work force is overweight?
3. How much of work force is over the age of 50?
4. What kind of shifts do the workers normally have?
5. Does stress have an effect on your workers?
6. Is sleep deprivation prevalent in your department and what are some of the effects?
7. What percentage of the workforce smokes?
8. Is there a fitness facility?
9. What type of access do the workers have to it?
10. Is the equipment up to date and properly maintained?
11. Do you see any injuries occurring frequently?
12. What is your position and what is your department's role within your organisations?
13. What types of programs are currently in place?
14. Do you have any programs that focus on stress management?
15. Are there any nutrition programs in your organisation?
16. Are efforts being made to support the workers in quitting smoking?
17. Is exercise mandatory?
18. Are workers given time to exercise during their working hours?
19. Are there regular psychological evaluations? If yes are they mandatory?
20. Is psychological counselling offered and is there a support system for employees?
21. How often is psychological counselling utilised?
22. Are there any incentives offered for using the current wellness program?
23. What is the general opinion towards the wellness program? / Have you noticed any reluctance towards participation in the wellness program?
24. What are the recruitment procedures? Are recruits pre-screened?
25. Have you noticed a change in the number of injuries and sick days since the implementation of the wellness program?
26. Are there any other programs you would like to be able to offer? If so, why?
27. How do you judge the effectiveness of your program?

Group Interviews

1. Can you describe an average day at your organisation?
2. Do you have time to work out on duty? Off duty?
3. What are the most challenging activities that you perform during a call?
4. Can you suggest any incentives that would encourage participation in wellness programs?
5. If a physical fitness program was put in place, would you consider using it?
6. Is there a particular wellness program that is popular?
7. Why do you like this program?
8. Are there any improvements that can be made to your current wellness program?
9. What types of wellness programs would you use if offered?
10. What do you think is the biggest source of stress in this line of work?
11. Does shift work affect your sleeping or eating habits? How?

Forum Discussion

1. What are your opinions on these preliminary recommendations?
2. Do you think the recommendations are feasible?
3. Are there any issues that we did not address?
4. Do you see any opportunities for collaboration?

Appendix C: List of Supervisors

Organisation	Name	Position	Contact Info
AFAC	Judy Gouldbourn	Human Resources Manager	Judy.gouldbourn@afac.com.au
AV	Cameron Williams	Health Promotion Team Leader	Cameron.Williams@ambulance.vic.gov.au
Bushfire CRC	Gary Morgan	CEO	
CFA	Jeff Green	OH&S Manager	J.Green@cfa.vic.gov.au
CFA	Michele Konheiser	Project Coordinator	m.konheiser@cfa.vic.gov.au
CFA	Peter Langridge	Health Services Team Coordinator	
CFA	Anna Ruzic	Health and Wellbeing Project Officer	A.Ruzic@cfa.vic.gov.au
CG	Mark Logan	Vice-Captain Wellbeing Team	wellbeing.vsc@coastguard.com.au
MFB	Rod Egglestone	Peer Coordinator	regglestone@mfb.vic.gov.au
MFB	Sue Jamieson	Employee Assistance Coordinator	sjamieson@mfb.vic.gov.au
MFB	Phil McInerney	Executive Manager Health and Safety	PMcINERNEY@mfb.vic.gov.au
MFB	Michelle O'Connor	Health and Fitness Coordinator	mmoconnor@mfb.vic.gov.au
MFB	Dr Jane Wadsley	Brigade Medical Officer	jane.w@phm.org.au
SES	Andy Bansemer	Volunteer Health and Wellbeing Coordinator	Andy.Bansemer@ses.vic.gov.au
SES	Elizabeth Mulhall	Project Officer of OH&S Software System	Elizabeth.Mulhall@ses.vic.gov.au
VicPol	Insp. Danny Bodycoat	Manager of Health Promotion & Support	Danny.bodycoat@police.vic.gov.au
VicPol	Sgt Martin Park	Employee Support & Welfare Services	
VicPol	Snr. Cons. Frank Smokrovic	Peer Support Coordinator	
VicPol	Alan Veitch	Program Development Officer/ HPO Coordinator	alan.veitch@police.vic.gov.au
VicPol	Dr Alex West	Head of Psychology	

Appendix D: Complete Program Listing

Organisation	Program	Needs/Issue	Methods
AV	Worksafe Health Checks	Long Term Health-Monitor	Health checks implemented by an external provider
AV	AVactive	Long Term Health-Behavioural Modification	Distributed information on health concerns and supported sports clubs
AV	Recruit Physical Testing	Long Term Health-Fitness	Sit-ups and pushups
AV	Recruit Medical Assessment	Long Term Health-Monitor	A basic physical examination
AV	Back to Basics Training	Injuries-Prevention	Education in proper use of new equipment and lifting techniques review
AV	Manual Handling Training	Injuries-Prevention	Education in proper lifting techniques in order to prevent injuries from manual handling
AV	Chaplaincy	Spiritual- Support	Provides spiritual support and assists with funerals, weddings, and counselling
AV	Victoria Police and Emergency Services Games	Long Term Health-Fitness	Olympics-like competition that allows emergency services personnel from all over Victoria to compete in a variety of sports
AV	Peer Support Program	Psychological-Support	A network of personnel trained in critical incident stress management. Respond to critical incidents and do follow up. Have a 24 hour call line.
AV	Psychological Assessments	Psychological-Evaluation	Mental welfare checks conducted by trained psychologists
AV	Internal Psychological Professionals	Psychological-Support	Up to six free sessions with professional psychologists employed by AV
AV	Health Promotion	Long Term Health-Behavioural Modification	Nutrition information and smoking information are distributed to workers
CFA	Peer Support Program	Psychological-Support	A network of personnel trained in critical incident stress management. Respond to critical incidents and do follow up. Have a 24 hour call line.

CFA	Chaplaincy	Spiritual- Support	Provides spiritual support and assists with funerals, weddings, and counselling
CFA	Recruit Stress Management Seminars	Psychological- Support	Explain welfare services and how to deal with stress
CFA	Recruit Psychological Assessment	Psychological- Evaluation	CPI 434 personality questionnaire including 434 true/false questions that takes 45-60 minutes to complete
CFA	External Psychological Professionals	Psychological- Support	Booked over the phone from head quarters or by workers
CFA	Healthwatch- Health Checks	Long Term Health- Monitor	Height, weight, and waist measurement; blood pressure, blood glucose, cholesterol, and triglycerides testing; data review and hand outs on diabetes, cholesterol, smoking, physical activity, weight control, high blood pressure, and alcohol
CFA	CFA safe	Injuries- Management	Online injury/hazard reporting software system. Individuals can report hazards and injuries which is automatically sent to their manager for attention, and then monitor their reports. Reports can also be made on paper, which is what is available to the volunteers.
CFA	Healthy for Life- Health Checks	Long Term Health- Monitor	Height, weight, body fat %, heart rate and waist measurement; blood pressure, blood glucose, cholesterol, oxygen saturation, energy consumption and expenditure testing; set up a doable plan to address results
CFA	Healthy for Life- Fitness Assessments	Long Term Health- Fitness	Tests include hand grip dynamometer, sit and reach, push-ups, sit-ups, prone bracing, VO2 shuttle run, and Astrand bike or Gerkin treadmill test; individualised exercise programs and an analysis of progressive results are given to the participant; results are compared to ACSM standards
CFA	Healthy for Life- Exercise Classes	Long Term Health- Fitness	Pilates, circuits, Be-fit, stretch and relaxation, tummy, hips and thighs, cardio-fit, and fit-ball
CFA	Healthy for Life- Seminars	Long Term Health- Behavioural Modification	Cancer awareness, healthy heart and cardiovascular disease, nutrition, diabetes, and Eat well, live well

CFA	Health for Life-Gymnasium Reviews	Long Term Health- Fitness	Reports status of state-wide gyms to OHS department. This usually happens once and then can reoccur on request.
CFA	Recruit Physical Testing	Long Term Health-Fitness	Shuttle run and fire fighting challenge test
CFA	Recruit Medical Assessment	Long Term Health- Monitor	Must pass to be hired
CFA	Critical Incident Response	Psychological-Support	If any worker calls peer support then multiple peers will come to provide psychological first aid, try to make contact within hours or a day of incident, may call a day later or hand out card if someone seems to be distressed
CFA	Fitness Facilities	Long Term Health- Fitness	Most career stations have gyms (containing but not exclusive to rowers, bikes, treadmills, fitballs, exercise mats, body fat scales, chin up and dip bar, and 7 weights of dumbbells) and career workers have time to exercise
CFA	Victoria Police and Emergency Services Games	Long Term Health- Fitness	An Olympic-like competition that allows emergency service workers from Victoria to compete in a variety of sports
CFA	Championship Games	Long Term Health- Fitness	Basic fire fighting practice and free health checks (same checks at Healthwatch provides)
CFA	Sports Clubs	Long Term Health- Fitness	Footy clubs etc.
Coast Guard	Peer Support Program	Psychological-Support	Brief counseling sessions to work through personal problems. Can be face-face, on the phone, or through email. This is known as the Personal Support Program within Coast guard
Coast Guard	Critical Incident Response	Psychological-Support	Psychological first aid
Coast Guard	Health Promotion	Long Term Health-Behavioural Modification	Newsletters that contain material on policies, tips on living a healthy life, dealing with traumatic incidences
MFB	Fitness Leaders	Long Term Health-Fitness	Trained personnel provide guided fitness training

MFB	Medical Monitoring	Long Term Health-Monitor	Consists of a large variety of tests conducted by a doctor including blood tests, liver tests, height/weight checks, skin tests, cancer screenings and many others
MFB	Vaccination Program	Long Term Health-Prevention	Workers are vaccinated against Hep B, influenza, and tetanus
MFB	Nutrition and Weight Management Programs	Long Term Health-Behavioural Modification	Improve health indicators through education and courses
MFB	Fitness Facilities	Long Term Health-Fitness	Provide free weights, resistance and aerobic machines, and an hour on shift to utilise them
MFB	Sports Clubs	Long Term Health-Fitness	Opportunity to gather for exercise
MFB	Posture and Flexibility Training	Injuries-Prevention	Exercise program to decrease chance of injury by strengthening muscles used for common movements
MFB	Core Stability Training	Injuries-Prevention	Exercise program to reduce chance of musculoskeletal back injuries
MFB	Program Prescription	Long Term Health-Fitness	Fire fighters can call in and request a personalised fitness program to address specific issues
MFB	Smoking Support	Long Term Health-Behavioural Modification	MFB pays for half of quitting costs and fully reimburses employee if they quit for 3 months
MFB	Recruit Psychological Assessment	Psychological-Evaluation	400 question screening looking into problem solving ability and personality traits
MFB	Stress Management Seminars	Psychological-Support	Given lectures in recruitment and all promotion and specialist courses
MFB	Peer Support Program	Psychological-Support	A network of personnel trained in critical incident stress management and general mental wellbeing techniques. Trained in mental health first aid and applied suicide intervention
MFB	Internal Psychological Professionals	Psychological-Support	Trained psychologists and social workers within the MFB that members can go to for a variety of issues

MFB	External Psychological Professionals	Psychological-Support	Trained psychologists outside of the MFB that members can go to for a variety of issues. This is called the IPS program
MFB	Critical Incident Response	Psychological-Support	Peers and mental health professionals respond to particularly bad incidents and provide support. They also provide follow up and referrals to continuing care by professional psychologists if needed.
MFB	Mental Health First Aid	Psychological-Support	a twelve hour course on psychological wellbeing and mental health literacy is offered to the entire organisations.
MFB	AIRS2 Data Analysis	Psychological-Support	A review of incident attendance to offer support to fire fighters who have been exposed to six or more critical incidents in a quarter
MFB	Wellbeing Checks	Psychological-Support	Mental health professionals assess psychological wellbeing. Also available to retired fire fighters
MFB	Fitness for Duty Assessments	Injuries-Management	Medical assessments on fire-fighters who have been off duty due to injury before they return
MFB	Fitness Assessments	Long Term Health-Fitness	Health checks performed by health and wellness officers. Checks height, weight, blood pressure, body composition, and cardiovascular fitness
MFB	REII	Injuries-Management	Online injury reporting system
MFB	Recruit Physical Testing	Long Term Health-Fitness	Shuttle run and fire fighting aptitude test
MFB	Recruit Medical Assessment	Long Term Health-Monitor	A medical examination to uncover conditions which may render a recruit unfit for fire fighting duties
MFB	Chaplaincy	Spiritual- Support	Provides spiritual support and assists with funerals, weddings, and counselling
MFB	Victoria Police and Emergency Services Games	Long Term Health-Fitness	Olympics-like competition that allows emergency services personnel from all over Victoria to compete in a variety of sports
SES	SES Safegate	Injuries-Management	Online occupational health and safety system, can report hazards and incidents and then monitor reports. Specifically adapted to meet the needs of volunteers and to be user friendly

SES	Peer Support Program	Psychological-Support	A network of personnel trained in critical incident stress management and general mental wellbeing techniques.
SES	Chaplaincy	Spiritual- Support	Provides spiritual support and assists with funerals, weddings, and counselling
SES	Healthwatch-Health Checks	Long Term Health-Monitor	Height, weight, and waist measurement; blood pressure, blood glucose, cholesterol, and triglycerides testing; data review and hand outs on diabetes, cholesterol, smoking, physical activity, weight control, high blood pressure, and alcohol
SES	Injurynet	Injuries-Management	Up to three meetings with health care providers and then must lodge a work cover claim
SES	Injurynet	Injuries-Management	Fitness for duty assessments for volunteers who have self-declared/SES identified an injury or disability
SES	Recruit Medical Assessment	Long Term Health-Monitor	Self declare medical conditions; if any conditions are of concern then applicant can do a fit for duty test
SES	Health Promotion	Long Term Health-Behavioural Modification	Information is distributed regarding nutrition information and smoking cessation
SES	Critical Incident Response	Psychological-Support	Unit controller is required to contact peer support if there is a critical incident, for example a car accident with fatalities
SES	Victoria Police and Emergency Services Games	Long Term Health-Fitness	An Olympic-like competition that allows emergency service workers from Victoria to compete in a variety of sports
VicPol	Peer Support Program	Psychological-Support	Trained personnel attend incidences, provide practical support and education, follow-up, station visits, and referrals
VicPol	Recruit Medical Assessment	Long Term Health-Monitor	Eye sight and hearing testing and BMI calculation
VicPol	Recruit Physical Testing	Long Term Health-Fitness	Duty based tests-handgrip, Illinois agility run, Beep Test, five push-ups, 60 second plank hold, obstacle climb, and 100m swim.
VicPol	Internal Psychological Professionals	Psychological-Support	Provide counselling usually on relationship issues, also on drugs and alcohol, workplace issues, etc.

VicPol	External Psychological Professionals	Psychological-Support	Provide counselling
VicPol	Duty Based Fitness Testing	Long Term Health-Fitness	Duty based tests-handgrip, Illinois agility run, Beep Test, five push-ups, 60 second plank hold, and obstacle climb
VicPol	Recruit Psychological Assessment	Psychological-Evaluation	Given before recruitment
VicPol	Welfare	Psychological-Support	Support, hospital visits, critical incidence response, suicide prevention, counselling, 24hr support and referral line, and follow ups
VicPol	Health Promotion	Long Term Health-Behavioural Modification	Smoking cessation, personalised fitness and nutrition programs, relationship advice
VicPol	Fitness Assessments	Long Term Health-Fitness	Blood pressure checks, waist measurements, cardiovascular assessments, strength testing, flexibility testing, diabetes testing, and max VO ₂ checks
VicPol	HPO Health checks	Long Term Health-Monitor	Blood pressure checks, glucose tests, cholesterol tests and waist measurement, develop plan for improvement, personalised nutrition advice, offered a set of government health checks once
VicPol	Sports Clubs	Long Term Health-Fitness	Meet regularly, allow members to participate in local competitions
VicPol	Victoria Police and Emergency Services Games	Long Term Health-Fitness	Olympic like competition that allows emergency personnel from all over Victoria to compete in a variety of sports
VicPol	Fitness Facilities	Long Term Health-Fitness	Fully equipped gym- free weights, resistance machines, cardio machines (bikes, rowing machines and treadmills)
VicPol	Critical Incident Response	Psychological-Support	Provided by professional psychologists, peers and welfare staff
VicPol	Chaplaincy	Spiritual- Support	Provides spiritual support and assists with funerals, weddings, and counselling
VicPol	Injury Management/ Rehabilitation	Injuries-Management	Create a return to work plan, rehabilitation counselling and referrals

Appendix E: Summative Team Assessment

While WPI provides its students with the opportunity to participate in group work prior to the Interactive Qualifying Project (IQP), none of these experiences are similar to the IQP which involves working as a group for 50 hours a week in a corporate environment to propose a solution to a problem which has no definite solution. Working in this new environment creates many challenges such as fostering good group dynamics and developing professional skills.

Our group quickly settled into a good team dynamic, with each of us assuming certain roles which allowed us to function as an effective unit. Dan was largely responsible for interpersonal communication with persons outside the group. This entailed interview scheduling and obtaining additional information. He also identified transportation to and from interviews and controlled the main computer during group writing. Julia assumed a leadership role within the group. She was largely responsible for resolving conflicts by trying to form a compromise and motivating progress through the creation of task lists and the setting of deadlines. Shauna made sure that we were following IQP and Australian writing guidelines. This included reminding us of guidelines from within the handbook and pointing out differences in spelling.

Our individual roles complemented each other during our writing process. The writing, editing, and revising of this report was a team effort in every step of the way. If the chapter was long and had many sections, we divided the writing evenly between us. If the chapter was short, we wrote the chapter together. Our revising was done together, which often was a slow and laborious process but ensured that each person's view and opinions were heard so that the final product was truly a representation of all of our work.

Revising and writing together generated many opportunities for discussion. All group members were free to express their opinions and explain their reasoning. We had an "ideas sheet" to keep track of thoughts and ensure none were lost. During interviews, we all took notes which we combined into interview summaries, ensuring a consensus on what was heard and averting later disagreements. However, there were still a few disagreements among the team.

Our group had some issues with differing interpretations of data and disagreements due to miscommunications between team members. In order to resolve these, we put into place simple systems. When we came across differences in interpretation of data, we consulted the source for clarification rather than making assumptions or arguing sides. Miscommunications were the main source of conflict for our group, until we implemented a policy of clarifying what was heard before disagreeing. Throughout the term, we conducted assessments of our individual and group performance. These, along with ideas from the advisors, assisted us with creating these systems. Through this process, we developed our group into a well-functioning and productive unit.