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Daniel Malone
mmaloneffa@hotmail.com

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Health and Safety in the Fire Service

By Mitchell Malone

Murray State University

Abstract

The fire service in the United States has problems that span for decades in any aspect you can think of. There has been hardly any improvements on the safety culture for fire departments. There is a need to define these issues and find solutions to the problem. I will be looking at research across the country and some even around the world from the last decade to piece together what is right and what is wrong with the safety culture and the fire service in general and to determine what the best solution and controls to fixing it.

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Introduction

As a volunteer firefighter, I have encountered, first hand, how dangerous the occupation of fire service is. I know the importance of safety in this career. I have had multiple minor injuries in my short time being a firefighter. There are few firefighters I have met that haven't had at least a minor injury in their time of service. It is actually more uncommon to not have an injury in their tenure. This is the shocking truth of every day lives working in this line of duty.

The Fire Service Deals with many obstacles. Just like law enforcement, there are many dangers of the occupation. Health and Safety is a must when it comes to the fire service. But it is often overlooked in today's fast paced environment. The fire service in the United States has problems that span for decades. There has been hardly any improvements on the safety culture for fire departments. There is a need to define these issues and find solutions to the problem.

I will be looking at research from many different fields and aspects from the last few decades to piece together what is right and what is wrong with issues that are plaguing the fire service and provide recommendations.

In this research project, I will research statistics for injuries, illnesses, and deaths in the career. Additionally, I will discover controls for these issues and hope to help the fire service reduce the horrid statistics of the occupation. Although accidents cannot 100% be avoided in a dangerous line of work, they can try to be prevented. Prevention is a big step in reducing the statistics.

In this project, I will discuss different issues within the occupation. After studying the more significant injuries and deaths, I have realized that even the small percentages of accidents can lead to death and it is important to bring light to every piece of the puzzle.

This research will mainly consist of statistics from the National Fire Protection Association along with other notable research articles from top fire service magazines and media outlets. This is important to note that the research will hold a factual basis behind the arguments and ideas I will be creating. Although there are numerous safety hazards within the profession of fire services; I will focus mainly on the topics that I feel currently pose the most safety and health risks

The Fire Service and EMS

First, it is important to know what the fire service and EMS is and what it does before we can dig deeper in the problems that are plaguing the occupation. Many people in the public do not fully understand what the fire service actually does. It isn't always shiny fire trucks and ambulances, loud horns, and bright lights. I was told in my firefighting recruitment training that the fire service is a do all service. If you have been in the fire service for some time, you would be able to feel every emotion on calls. There are boring, happy, funny, exciting, and sad calls. In some cases, you can find all of these emotions in one call. But most of the time, it's not as exciting as you might think.

There are over 1.1 million firefighters in the United States ~~www~~ which may seem like a lot until you look at the population of the United States and see that under 1% of the population are firefighters. This means that many things in the fire service go unnoticed and unappreciated. The NFPA fact sheet from 2016 shows that 70% of all firefighters are volunteer. Although there are major differences in volunteer and career departments, the occupation is the same, along with most training and certifications.

The fire service is made up by many counterparts. There are many types of components and many types of firefighters. There are many specialties in the fire service that make up the whole. There are municipal fire departments, wildland, rural/county, volunteer, emergency medical services, aircraft, shipboard, hazardous materials, special operations, and rescue. Rescue has several different types that complete it as well, such as, water, high-angle, urban, heavy, etc.

There are different roles as well. Every firefighter is generally assigned to a specific role. There are times when this is not possible, normally on volunteer departments. Some roles and responsibilities are, truckies; they essentially prep the scene and help contain the fire by ventilating and getting material out of a fire. Nozzlemen/women are on the nozzle of the hose actually extinguishing the fire. Emergency medical technicians and paramedics give medical care to patients and transport to hospitals and medical centers. Engineers drive the fire apparatus and operate the trucks while on scene. Rehab and support personnel fill air tanks, maintain equipment, and give essentials like water and snack foods to resting crew. Rescue crews have many responsibilities and are the ways that extricate victims out of dangerous situations. Lastly, you have an officer corps. They are in the leadership roles and have a rank structure much like you would see in a military branch.

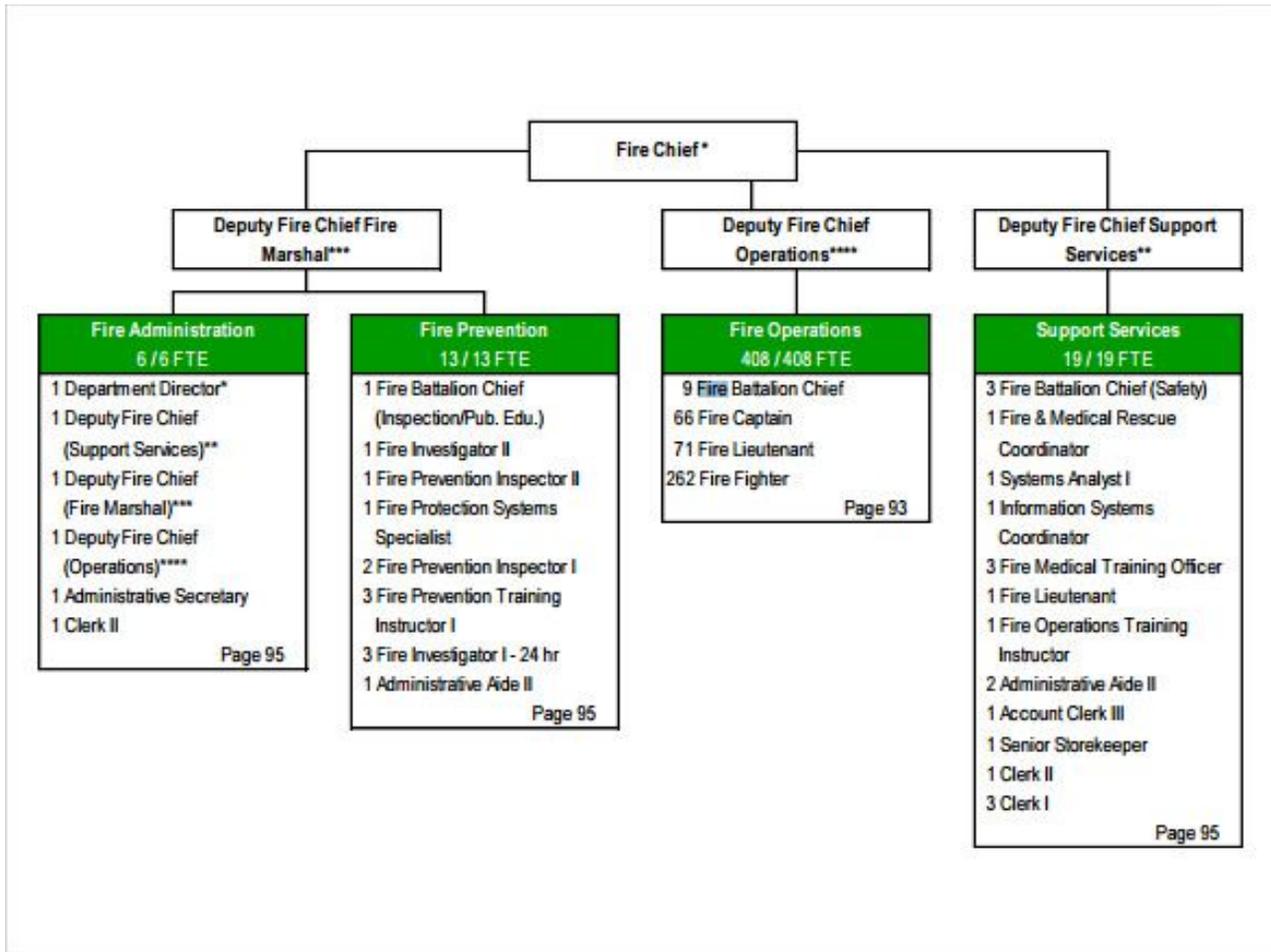


Figure 1-1 Fire Department Rank Structure. SampleTemplates.com

There are a lot of misinformation and myths about the fire service that most of the public doesn't know. The biggest misconception is that they think that EMS and Fire Departments are two separate entities; some cases this is true. However, most career fire departments and some volunteer departments have EMS in-house. Meaning that the fire department operates the ambulances in their district. The United States Fire Administration reports that 20.7% of all fire departments have EMS transport services.

Ambulance services are usually operated by hospitals but there are private ambulance services as well.

Even though not all fire departments have ambulances for transport, they can still provide emergency medical services. EMTs and paramedics work on fire departments without operating an ambulance. The United States Fire Administration says that 58.7% of all fire departments in the U.S can provide basic life support and 38.8% can provide EMS non-transport response. This is important because medical services are the number one response for fire departments. The myth that a fire department only does fire related responses is popular. People don't think that the fire department's number one job to be giving medical aid.

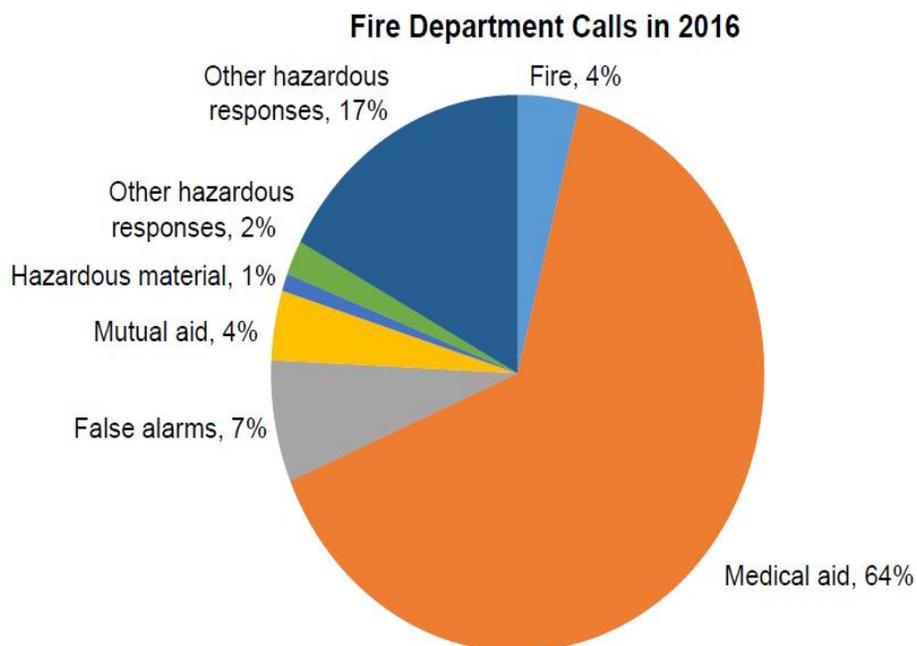


Chart 1-2

Another popular myth of the fire service is that a lot of the job is like what they see in movies and television shows. Some people tend to believe that if the fire department is called to a motor vehicle accident then the vehicle must be on fire or might explode. This is far from the truth. A study from the National Fire Protection Association claims that only 3% of vehicle fires from the year 2003-2007 were caused by collisions or rollovers. The largest reason for vehicle fires were mechanical malfunctions at 49%.

If you look at chart 1-2, you can see that the fire service is more than just fighting fire. In fact, fires only make up 4% of all calls received for the fire service.

Other hazardous responses make up 19% of all calls. These can include anything from basic traffic control, rescues, and stage-ups. Stage-ups are a common call where fire departments will stand by in case of an emergency. Threats such as bomb or mass shootings could be a reason for a stage-up. Others might include gas leaks or other hazardous situations to the public.

There are many hazards in this industry. But there are even more hidden dangers and underlying problems that the public does not see or realize. But the bigger obstacle is presenting these hazards and dangers to firefighters and EMT/Paramedics and persuading them that these exist and that there can be controls for them as well.

Physical Health

Most often, firefighters are seen in movies and television shows as muscular and very fit and well groomed. In reality, this is not always true. Firefighters have to take a physical fitness test, also known as the Candidate Physical Aptitude Test, when becoming a firefighter but being in shape isn't always a top priority. However, it should be. The CPAT is made to hold firefighters to a standard. When that standard is not being met, there are many health related injuries that come along.

In an article by *Fire Rescue Magazine* titled, "The Importance of Physical Fitness Standards in the Fire Service," they make a very good representation and comparison with the fire service and professional sports. "The career of a professional athlete is limited on the basis of their ability to physically perform to the standards their fans demand. For some, careers are shortened by an unexpected injury; others face the consequences of poor genetics or a less-than-disciplined youth. And yes, there are the chosen few who defy all odds and perform beyond their years, but they are few and far between. In stark contrast to the world of professional sports, the fire service is not faced with a fan base that demands a roster of homerun hitters, three-point shooters or celebrity personalities. Nor are we afforded the opportunity to have an occasional bad day. Firefighters are expected to perform at their highest level, without exception and without excuses, on every call."

With that representation presented, it may seem like physical health is very important in the line of work. If a firefighter cannot perform to their best ability, then they could put their life in danger along with their fellow firefighters around them. You may ask why it puts others at risk or in danger. For example, this puts others in harm's way because if a firefighter gets exhausted and needs help to get out of a burning building, then the other firefighters must carry the weight of another firefighter while the structure deteriorates. There is a common unwritten rule in the fire service that a firefighter's first responsibility is to take care of themselves before anyone else. If they cannot keep themselves in a good state of health, they can't be any help for victims or their coworkers.

In the year of 2016, the NFPA recorded that the category with the most injuries on the job were strains, sprains, and muscular pain (pulled/torn). Granted, there is a strong possibility that not all of these are preventable and some are accidents and that should be noted. However, they are physical injuries none the less and the number one injury reported. Any of these 3 injuries could cause more serious complications if they occurred on scene. The NFPA also revealed that being on scene on the fireground is where the most injuries occur.

Fireground injuries are the most serious even for minor injuries. If you are working a structure fire and are on a nozzle and pull a muscle, you could let the hose go and set off a chain reactions of events that could cause even more injury. Accidents happen more frequently on the fireground which seems to be pretty obvious.

There are other accidents and incidents that happen on the fireground as well. Although they might not be as frequent, it does not mean that these can't cause serious injury or death. If you think of being struck by lightning, it is rare to happen but if it does, it could be catastrophic. It is the same way on the fireground. Anything can happen and nothing typically goes to the way firefighters are trained on.

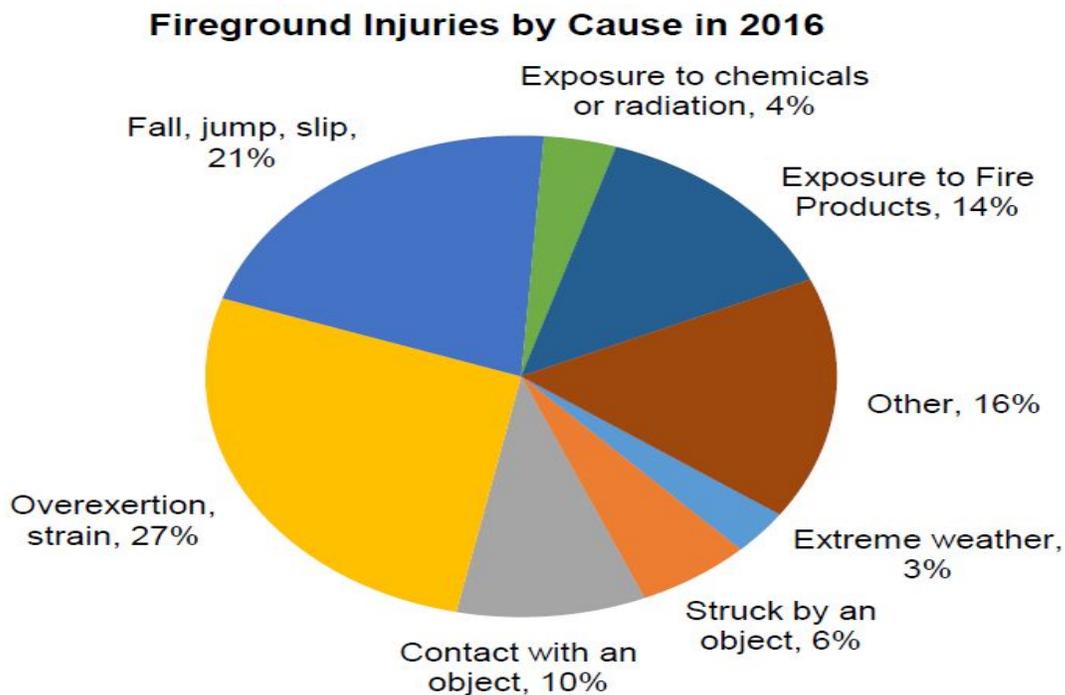


Figure 2-1 2016 NFPA Fact Sheet

Cardiology illnesses are very prominent in this field. It has been the number one killer of firefighters almost every year for the past decade. It is one of the silent killers of

firefighters. *Medical News Today* claims that, "In the United States, around 45 percent of firefighters' on-duty deaths are due to cardiovascular events."

To find out what is causing such a high rate of deaths from heart conditions, we must look at risk factors associated with them. A list by *WebMD* has the risk factors as,

- Gender (males are at greater risk)
- Age (the older you get, the higher your risk)
- A family history of heart disease
- Being post-menopausal

Controllable risk factors include:

- Smoking
- High LDL, or "bad" cholesterol, and low HDL, or "good" cholesterol
- Uncontrolled hypertension (high blood pressure)
- Physical inactivity
- Obesity
- Uncontrolled diabetes
- Uncontrolled stress and anger

Some of the risk factors are pretty noticeably high in the fire service. As we discussed previously, physical inactivity by firefighters are a risk factor. Obesity can be linked to the physical inactivity as well. An unhealthy diet can also affect cholesterol. Being a male is a uncontrollable risk factor but the fire service is made up by 93% male members. A study by Iowa State University shows that 41% of volunteer firefighters were classified as obese and 35% as overweight. Also track that the 70% of all firefighters in the United States are volunteers. There is definitely a lack of physical activity and clearly not a healthy diet. This could be extremely dangerous for the firefighter and their co-workers.

Tobacco use is high in the fire service. A study in the 1990's had the smoking rates for firefighters at 40-50%. A more recent study by US National Library of Medicine and National Institutes of Health confirmed that 13.6% of paid/career firefighters are smokers, and 17.4% of volunteer firefighters are as well. Smokeless tobacco use rates are roughly about the same, 18.4% of career firefighters and 16.8% volunteer firefighters. This is putting firefighters at a greater risk than they already are.

One risk factor that the list didn't mention was heat and dehydration. Researchers in the United Kingdom have discovered something that could be another culprit of such high cardiological injuries and deaths in firefighters. This experiment was conducted with 19 healthy and non-smoking firefighters by wearing heart monitors. The monitors along with healthcare personnel recorded heart rhythm, pulse, blood pressure, and electrical impulses in each area of the heart. They conducted two separate training

events 1 week apart in which they had to rescue a victim in a 2 story structure all while dealing with extreme heat at or above 752°F.

They also took samples of their blood immediately after the exercise, 4 hours later, and 24 hours after. They discovered in these blood samples that the blood was at a higher risk of clotting after the exercise. The heat along with extreme physical conditions was, in their opinion, the reason for such a higher risk. Dr. Nicholas Mills, chair of cardiology and consultant cardiologist at the University of Edinburgh, Scotland said, "Lower blood pressure immediately following fire suppression is likely due to dehydration and an increase in blood being diverted to the skin to help the body cool down. We discovered the core body temperature increased, on average, nearly 2 degrees Fahrenheit over 20 minutes. And increases in hemoglobin occur as the body loses water and the blood gets more concentrated."

So, with this research shown, the risk of heart related deaths and illnesses are extremely high especially with being exposed to high temperature of heat and smoke. This research shows that most heart related illnesses are directly linked to the everyday tasks and exposures for firefighters. The graph below shows that the highest risk of heart related illness and death comes from either physical exercise or most likely an increased heart rate.

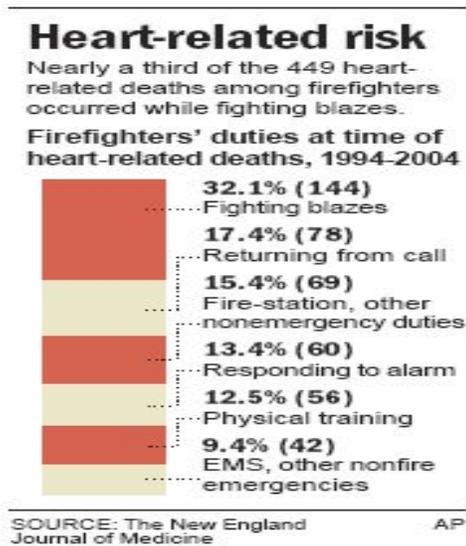


Chart 2-2

There is already high risk for cancers come from smoke and fumes that are inhaled everyday. These are toxic to the lungs and other organs in the body. Firefighters who do not wear their Self Contained Breathing Apparatus are at a higher risk. Also firefighters who do not clean their Personal Protection Equipment are at a higher risk for cancer too because of the skin exposure. This can also be dangerous to the firefighter's families. Toxins can be stuck on clothes after the dirty PPE has been taken off. If they go home with those clothes on, it could be deadly for infants and also an exposure to other family members as well.

The Columbus Dispatch of Columbus Ohio wrote a story on a local firefighter who had terminal cancer. They said he responded to more than 200 fires during his time in service. They claimed that there is really no way to pinpoint what exposures are causing such a high cancer rate because every fire has toxins. Some are worse than

others. They also said that overhaul is possibly the highest exposure for firefighters. Overhaul is the operation that takes place after the fire has been controlled. They make sure that there are no hotspots to ignite the fire again and take away fuel sources around areas at risk to ignite again. During this operation, firefighters normally take off their SCBA and some even take off their turnout jackets. This is a huge exposure because the fire might be knocked down, but there is still toxins and smoldering ashes in the air. They are directly breathing in everything that burnt. There could be a variety of things burnt as well with every fire.

The smoking and tobacco use rates were already presented but it is important to look back at those statistics when discussing cancer rates as well. When there is already exposure to toxic chemicals/fumes and tobacco use; there is going to be a high risk for cancer. However, even though it is well known that the firefighter cancer rate is higher compared to the general population, there has not been exact numbers on the actual risk compared to the general population. Although there was a study by NIOSH that claimed that firefighters have a 9% higher risk of getting cancer than non-firefighters and a 14% higher chance of dying from that cancer than non-firefighters. This study was conducted in a shorter period of time which many people claim is not as accurate. There is currently a 30 year research that is being conducted by The University of Arizona and funded by FEMA to get a better sense of the cancer rate and also what exact exposures have the highest risk for cancer. That research won't be completed until 2046 so it will take a while to discover the secrets of cancer in the fire service.

What we do know is that cancer is one of the greatest problems. We know that this occupation has a high risk for cancer. We know that there are obvious reasons why that would be the case. But there are also new theories and research that show smoke may not be the greatest risk for cancer causing toxins.

Apparatus and Struck-By Accidents

One of the most dangerous parts of the job is driving to the scene of an emergency. The apparatus of any kind, whether it be an ambulance, any type of fire trucks, boats, aircraft, ect. This accidents are common and can lead to serious injuries or death. Fire personnel can also be struck by civilian cars passing the scene. These accidents are not quite the same as other vehicle accidents. These are different because they are emergency vehicles and first responders.

Fire apparatus is built differently than your ordinary car. The victim or patient needs the emergency personnel to be there and the personnel need to stay safe while trying to get there as quickly as possible. One of the more common causes for fire apparatus is backing. When moving in reverse, there is a higher risk of injury and damage to the truck or anything around it. There is also a risk that if the apparatus backs into a hazard like a gas meter, it could also result it serious injury. On the

fireground, there is limited visibility to see behind the apparatus. Especially at night when all you can see is flashing lights and hearing yelling.

Injuries can be minor to very severe to death. There are risks for crushing injuries, risk of being ran over by the apparatus, and more. It is important to find out the possible causes of this common injury to try to reduce the number of very preventable injuries and deaths.

The next graph shows the statistics of fire apparatus accidents from 1995-2010 and sequentially showing the fatalities from those accidents.

Fire Apparatus Accidents 1995-2010

Year	Fire Apparatus Collisions	Fire Apparatus Collisions Injuries	Privately Owned Vehicle Collision Injuries	Privately Owned Vehicle Collisions	Crash Injuries as a Percent of All Firefighter Injuries
1992	11,500	1,050	1,575	150	N/A
1993	12,250	900	1,675	200	N/A
1994	13,755	1,035	1,610	285	N/A
1995	14,670	950	1,690	190	1.2
1996	14,200	910	1,400	240	1.3
1997	14,950	1,350	1,300	180	1.8
1998	14,650	1,050	1,350	315	1.6
1999	15,450	875	1,080	90	1.1
2000	15,300	990	1,160	170	1.4
2001	14,900	960	1,325	140	1.3
2002	15,550	1,040	1,030	210	1.5
2003	15,900	850	980	85	1.2
2004	15,420	980	1,150	220	1.6
2005	15,885	1,120	1,080	125	1.7
2006	16,020	1,250	1,070	210	1.5
2007	14,650	915	665	120	
2008	14,950	670	1,000	70	
2009	15,100	820	870	100	
2010	14,200	775	1,000	75	1.0

Source: NFPA Survey of Fire Departments for U.S. Fire Experience.

As you can see, the numbers of injuries have gone down over the last few years of this graph but you can see the number of accidents are staying the same. This will be because of better safety standards set for apparatus manufacturers. Newer apparatus is

a lot more safe than it was previously. But there are still fatalities that make up too big of a percentage when it is compared to all firefighter fatalities.

Firefighter Deaths by Apparatus Accidents 1994-2011

Year	Total Firefighter Fatalities	Total Vehicular Fatalities	Fire Apparatus Collision Fatalities	Privately Owned Vehicle Collisions Fatalities	Struck at Vehicle Collision Scene	Fatalities as a Percent of All Firefighter Fatalities
1994	104	13	10	1	2	13
1995	97	14	7	5	2	14
1996	95	20	8	8	4	21
1997	96	17	7	5	5	18
1998	91	16	8	4	4	18
1999	113	15	9	2	4	13
2000	103	20	12	3	5	19
2001	103*	15	7	5	3	15
2002	100	11	2	5	4	11
2003	111**	28	18	6	4	25
2004	108**	13	5	5	3	12
2005	99**	15	11	3	1	15
2006	92**	8	4	2	2	9
2007	106**	20	9	10	1	19
2008	108**	14	6	7	1	13
2009	78**	14	10	3	1	18
2010	72**	9	3	3	3	13
2011	64	6	1	3	2	9

*Firefighters lost in the World Trade Center not included.

** Firefighters under the inclusion criteria of Hometown Heroes Survivors Benefit Act not included.

Source: USFA Firefighter Fatality Reports 1994-2011.

As you can see, even though in recent years it has gotten better than in the late 1990's, it still is an ongoing problem that needs to be resolved. The fatalities graph fluctuates which means there will be good and bad years in these statistics. I believe that there is a way to reduce these preventable injuries and keep a steady low number on injuries and fatalities in apparatus and struck by accidents. In 2010 and 2011, the number was in single digits for fatalities back to back.

As was previously stated, the apparatus manufactures have put safety more on the priority list. Some of the features that are being installed in apparatus are, stronger cabs, alarms for having the apparatus is drive gear without wearing a seatbelt, and more compartments to store equipment in the cab securely. The alarms for seatbelts are not like your regular vehicle alarms, they are usually a continuous loud and annoying noise until all seat belts are on. Although it is often inconvenient when leaving the station quickly and trying to radio to dispatch, it ensures that everyone is wearing a seatbelt in route.

Wildland Firefighting

As was previously discussed, there are many components that complete the whole fire service. Wildland Firefighting is a component that has specific dangers to the service and is often more fatal than the rest of the components. Basic fire science tells us that fire is unpredictable. When you have fire in a large open area, it is very unpredictable and can quickly lose control. On average, there is almost 100,000 wild fires and brush fires every year.

There are generally the same hazards as municipal fire fighting along with others. Some hazards include:

- Heat
- Smoke

- Exhaustion
- Sleep Deprivation
- Stress
- Aircraft/Aviation Accidents
- Vehicle Accidents
- Entrapment
- Burns/Burnover
- Falling Objects (Trees)

Leadership and quick decision making are critical attributes to have in wildland firefighting. Although there are no statistics to back this claim, if you read incident reports for injuries and deaths for wildland operations, you can see that this is generally the reasons for situations to turn bad. Communication is also another reason for that. In my recruitment training we were told a story that happened in the state of Kentucky where multiple crews were working a brush/wildfire and didn't effectively communicate where everyone was working. It resulted in a crew being entrapped by the fire lines they had started.

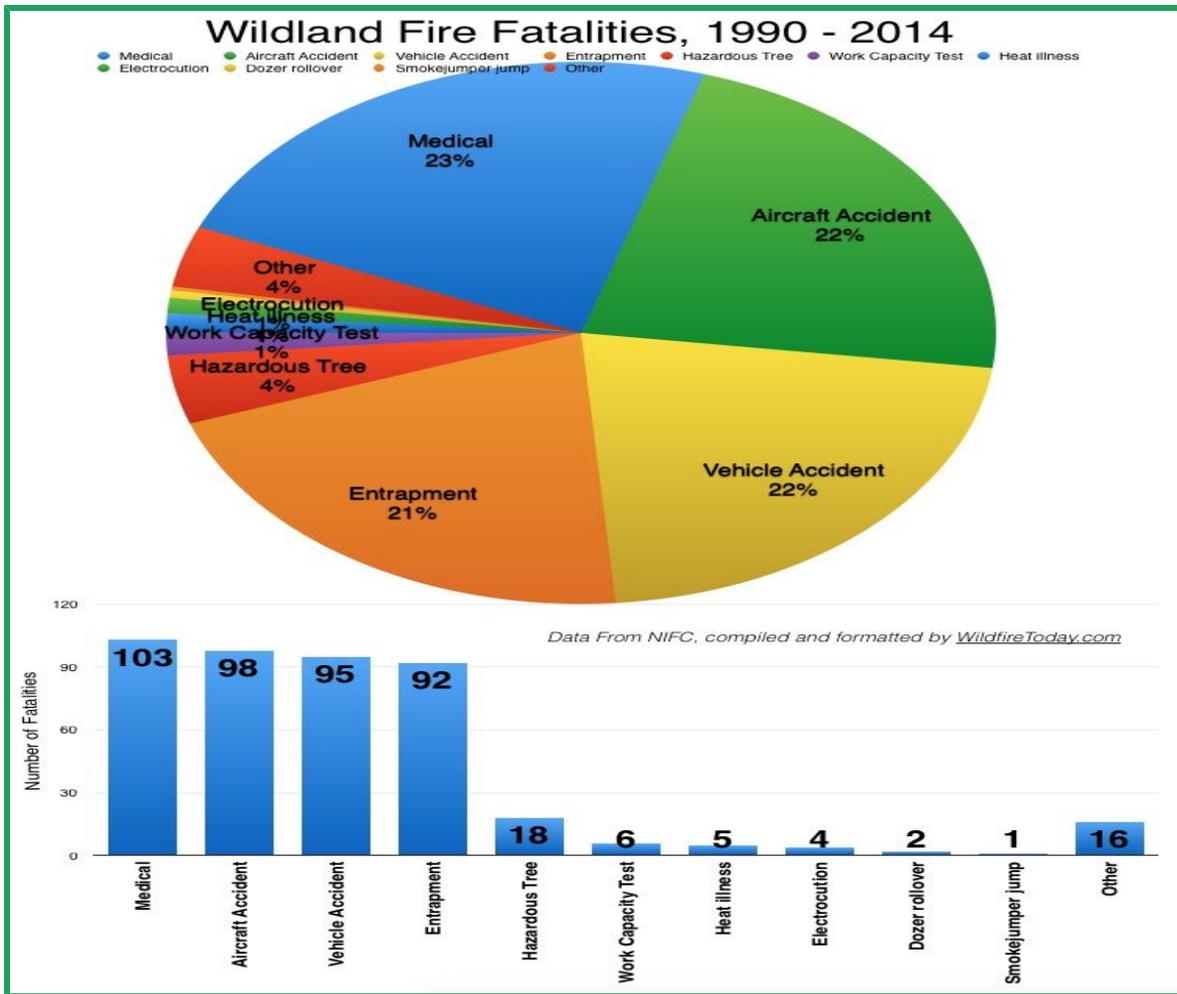


Chart 3-1 Wildland Fire Fatalities. *Wildfire Today*.

Hot Shots are some of the most elite firefighters in the world. They fight fire with fire. They will get in front of a wildfire and use techniques to slow down the fire with drawing a line by burning any fuels like brush and trees and they also dig trenches to help with the process. With this job comes great risk The hazards that were previously discussed are hazards that hot shots see every day working a wildfire with the exception of aircraft accidents. Entrapment and burnovers are the most common for hot shot fatalities. Stress, exhaustion, and sleep deprivation are most likely the key to

solving injuries and fatalities. These affect mental and physical health and can cause bad decision making during vital moments of operations.

Smoke from wildfires are very toxic because the smoke stays in the area for days, weeks, and sometimes months after the fire has already passed. Fire crews in the area breathe these toxic fumes constantly. Wildland firefighters do not typically wear a SCBA. They will be breathing smoke until they leave. These firefighters stay until the fire is contained, which could last several weeks. The smoke isn't just from trees and brush, houses and commercial structures are also being burned by these fires. You never know what dangerous chemicals may be contained in these burning commercial structures; this adds complexity to the already dangerous situation. It would be like being around smoke in a structure fire and not wearing an SCBA. This is a great health risk that hardly anyone is addressing.

One of the reasons wildland firefighting is dangerous is because they are understaffed. In recent years, we have seen departments from across the country send apparatus and firefighters that volunteer to help with wildfires. Greater numbers help contain the fires. Wildland firefighter is very rewarding but also very hard work for weeks on end. There has also been an increase on the amount of land that is being consumed by wildfires. This is mostly to do with more fuels. There are more people now than there was 30 or 40 years ago and newer houses and structures are being built in at risk areas with more flammable materials. This is costing the wildland service more and more money to battle these larger fires. Cal-Fire, one of the biggest and well know wildland

fire departments announced that the cost to battle the fires has grown tremendously over the years.

Cal Fire's fire fighting costs increasing



KPCC using Quartz's Chartbuilder

Data: Cal Fire; dates show year fiscal year began; 2016 data is through 8/18

The most infamous story of wildland firefighting was the Granite Mountain Hotshots. They were fighting the Yarnell Hill Fire in Arizona on June 30th, 2013. High winds that day caused the fire to spread rapidly. The fire was basically following the winds and the speed of the winds. The Granite Mountain Hotshots were in the direct path of the fire and were forced to deploy their emergency fire shelters. All 19 firefighters died that day. It was the second greatest loss of firefighters in U.S history falling just behind the 343 firefighters that perished on the September 11th, 2001 terrorist attacks. According to the National Fire Protection Association, not all the bodies were found inside the shelters. This is very important because it means that they either didn't have enough time to get in the shelters or that the shelters got too hot and they tried escaping from the heat. There were two issues that were raised with this concern, if they didn't have enough time to get in their shelters then there was a communication

or critical decision issue. Also, the fire shelters failed either way, so this was a huge problem that needed to be resolved to prevent this from reoccurring. There has been significant changes to the fire shelters ever since that day. The shelters can now withstand even higher temperatures before and when used properly and effectively will give firefighters a better chance at survival.



Emergency Fire Shelter. *Wildfire Today*.

If you look back at Chart 3-1, you will notice that vehicle accidents were the number one cause for fatalities in wildland firefighting. In the previous chapter, we looked at apparatus accidents and how deadly and costly they could be. In wildland firefighting, it can be even more dangerous when operating a vehicle. Low visibility from smoke and fire can cause accidents. Combine that with rough terrain and possible off road terrain and it is a recipe for disaster. Not only do you have to worry about wrecking

the fire apparatus, you have to think that low visibility will interfere with seeing fellow firefighters as well and could result in running over or crushing someone.

Mental Health

Mental health is, in my opinion, something that is so far overlooked that it is tearing the lives of fire personnel. It interferes with the job and protecting victims and coworkers. When studying physical health, we were able to find extensive research because it is visible injuries or visible symptoms. In mental health, it is often not seen. Many people in the fire service do not tell anyone when they have mental health issues in fear of scrutiny. It often goes unnoticed because they do not tell anyone. The expense of mental health treatment is too much to make it reasonable to see help as well.

With that being said, I believe that it is like I discussed in physical health; If you are in the fire service long enough, you will get at least a minor injury. In the case of mental health, I believe that firefighters and ems personnel will have an encounter at some point that will affect their mental health, whether that last a few hours after the incident or long term.

If you are in the fire service, you see things that a normal person might not ever see in their lifetime. Fire personnel see death and destruction frequently. The stress can be overbearing as well. You don't always have to see things, sometimes experiencing a close call will mess with your mindset. It isn't a guarantee that you make it home safe. You see horrible extreme things that can be overwhelming I have personally been on calls that I have lost sleep over.

It is important that a mental debrief is given after every bad call. What might not affect you could affect another coworker more than anyone. Everyone operates differently. Some people can get over a traumatic event shortly, while others it can last weeks, months, and even years.

It is important for coworkers and anyone involved in the fire service to know the signs and symptoms of mental illness. Here are the symptoms of the most common mental illnesses in the fire service from the *Mayo Clinic*.

Post-Traumatic Stress Disorder

- **Intrusive memories**

Symptoms of intrusive memories may include:

- Recurrent, unwanted distressing memories of the traumatic event
- Reliving the traumatic event as if it were happening again (flashbacks)
- Upsetting dreams or nightmares about the traumatic event
- Severe emotional distress or physical reactions to something that reminds you of the traumatic event

- **Avoidance**

Symptoms of avoidance may include:

- Trying to avoid thinking or talking about the traumatic event
- Avoiding places, activities or people that remind you of the traumatic event
- Negative changes in thinking and mood
- Symptoms of negative changes in thinking and mood may include:
 - Negative thoughts about yourself, other people or the world
 - Hopelessness about the future
 - Memory problems, including not remembering important aspects of the traumatic event
 - Difficulty maintaining close relationships
 - Feeling detached from family and friends
 - Lack of interest in activities you once enjoyed
 - Difficulty experiencing positive emotions
 - Feeling emotionally numb

- **Changes in physical and emotional reactions**

Symptoms of changes in physical and emotional reactions (also called arousal symptoms) may include:

- Being easily startled or frightened
- Always being on guard for danger
- Self-destructive behavior, such as drinking too much or driving too fast

- Trouble sleeping
- Trouble concentrating
- Irritability, angry outbursts or aggressive behavior
- Overwhelming guilt or shame

Depression

- Feelings of sadness, tearfulness, emptiness or hopelessness
- Angry outbursts, irritability or frustration, even over small matters
- Loss of interest or pleasure in most or all normal activities, such as sex, hobbies or sports.
- Sleep disturbances, including insomnia or sleeping too much
- Tiredness and lack of energy, so even small tasks take extra effort
- Reduced appetite and weight loss or increased cravings for food and weight gain
- Anxiety, agitation or restlessness
- Slowed thinking, speaking or body movements
- Feelings of worthlessness or guilt, fixating on past failures or self-blame
- Trouble thinking, concentrating, making decisions and remembering things
- Frequent or recurrent thoughts of death, suicidal thoughts, suicide attempts or suicide
- Unexplained physical problems, such as back pain or headaches

According to a the Journal of Emergency Medical Services, a survey that was conducted with 4,000 fire service personnel found that 6.6% of participants had attempted suicide in their time of service. That is 264 people out of 4,000 that attempted to take their own lives. Remember that according to *FEMA* there are 1,160,450 firefighters in the United States. This study was less than 1% of the firefighting population. According to the survey, if there are 264 people for every 4,000, then that means out of all firefighters, 76,590 fire personnel have attempted suicide. That number is extremely high. Percentages only show a small number. When you are putting that number as people rather than a percentage, it is a lot more sensitive.

One of the most troubling statistics is that in the past decade, there were more suicides in the fire service than there were line of duty deaths. 103 firefighters and ems members committed suicide while there were 93 LODD's in 2017. A majority of the suicides, they are still unknown. They did not know the reasons that led to the suicide. The suicides are not included in the line of duty deaths per year and that is why it is not well known. I think that it should be included. It would bring more awareness to how big of an issue it really is. It would make up the highest percentage of deaths in the fire service per year.

Rick Markley of Fire Rescue 1 magazine says that there is a possibility that many fire service member suicides go unreported. I believe that is a strong possibility.

Volunteer departments may not report suicides. They might not think about reporting it for the wishes of the families or they might not think that it was service related. It is difficult to know when a majority of the suicides have unknown reasons. It is difficult to pinpoint if it was related to their time in the fire service. But nevertheless, it is happening more frequently in the fire service compared to civilians.

With all this stress, many firefighters turn to coping methods that are not healthy. We already talked about tobacco use and its effect on the fire service. There is other coping methods that are seen daily, such as, alcoholism and drug abuse. Alcoholism is an easy way to cope. It's easy to get and it gets easy to get attached to if it helps forget things they have seen but it can quickly ruin families and lives if not controlled.

In a study funded by FEMA's research and development, they asked 656 firefighters to answer survey questions. 97% of the 656 answered the questions. 85% of career and 71% of volunteer firefighters said they had drink alcohol in the last month. Approximately half of the participants claimed they had binged drank in the last 30 days. According to the 2013 National Survey on Drug Use and Health, 62% of participants claimed they drank alcohol in the last 30 days. This means that the fire service drinks significantly more than non-firefighters.

This doesn't seem like a large amount of drinking but the study also didn't cover how much alcohol they were drinking. Binge drink might mean different things to different people. The large amount of drinking can lead to more serious drinking. There

is also the possibility that not all the answers were truthful. They could find it frowned upon if they said that they drank every day off or more than what is normal.

Studies that have to do with sensitive subjects like alcohol are not always truthful and can't be the sole part of research. Stories are often a good way to realize that there are problems. One story is from former Dallas Texas firefighter Austin Campbell. He claims that he started drinking heavy after difficult experiences and trauma that he encountered in the fire service. After two DUI's in two years, he lost his dream job of being a firefighter.

During this story by Dallas ABC affiliate WFFA 8 News, they claim that alcoholism is 2 to 3 times higher in the fire service than the general population. Austin now is a addiction counselor for people experiencing the same addiction as he once did.

In Daviess County Indiana, there was a volunteer firefighter, Colby Blake, that was drunk driving to the scene of a vehicle accident when he struck and killed a fellow firefighter. This is a real and raw issue. Addiction controls lives. It clouds a sense of judgement and can cost everything, your dreams, your job, and your or someone's life.

Another form of addiction is drug abuse. While it is hard to find statistics on drug use in the fire service because if they are currently employed they probably won't take a survey and say they are addicted to drugs. The United States Fire Association estimates 10% of all firefighters may be using illegal substances. You might ask yourself how they could be addicted to drugs and not get caught. It all depends on the department. Volunteer departments might have have the money to drug test and career

departments might not drug test frequently or only do random drug testing and they could slip through the cracks. Another flaw is that fire and EMS personnel may be exposed to drugs while working with patients. So it is hard to drug test authentically.

It only makes sense that this could be a problem in the fire service. The opioid crisis that is currently happening in the United States could mean, and most likely, that fire personnel are affected. It is easy to become addicted to these drugs. We saw the injury statistics in the Physical Health chapter. In this chapter I discussed the stress and other mental health issues that are causing addiction. If a firefighter gets injured and is prescribed these medications, it can quickly turn bad.

Bloodborne Pathogens and Drug Overdoses

Bloodborne pathogens and hazardous materials are less common for injuries and deaths but they still are a huge safety risk, especially EMS personnel. Some of the serious types of bloodborne diseases are Hepatitis B and C, HIV/AIDS, Syphilis, and Malaria. These diseases can ruin a career and lives. It is more common to get a needlestick than one might think. Medical gloves are very thin and cannot stop a sharp object like a needle. This is a lot more frequent in EMS than in the regular firefighting. During my time spent on an ambulance, I got to see the drug abuse crisis up close. It is something that continues to happen. All it takes for EMS personnel to get stuck by a needle is one in clothing such as pants or shirts.

A study was requested by a municipal fire department and conducted by the Health Hazard Evaluation Program and supported by the CDC. They studied the workplace and gave surveys to the firefighters as well as interviews to discuss health and safety issues. Two-thirds of the firefighters said they had touched and handled used needles on calls. They all reported to be wearing gloves when doing so. 40% also said that they had come in contact with illegal drugs while on the job. Roughly 16% said that they had been exposed to a bloodborne pathogen at some point in their career, citing that it was normally just bodily fluids that was in contact with their skin or clothing.

Injuries caused by exposure is not common but what stood out to me was that not all the firefighters interviewed said that they had gotten a bloodborne pathogens training. If the firefighters that didn't receive the training are not EMT or Paramedic Certified then it is a little understandable being that they are not normally around exposures.

Another hazard is dealing with a drug overdose patient. The opioid crisis is real and is in full effect in modern times. It is becoming more and more common on medical calls for it to be a drug overdose. But things can turn even uglier for first responders. Once the drug narcan is administered, the patient should come back down from their high. Once this happens they can become violent..

In the study and interviews they asked questions about mental health and the opioid crisis and how it is affecting their mental well being. There were numerous answers about drug overdoses when it came to stressors and traumatic events. The

drug overdoses are hurting everyone. It's clearly harming people directly and indirectly. The first responders are being put into this situation and are suffering the traumatic experiences. It is becoming a big cause for PTSD and depression in firefighters and EMS.

Volunteer Firefighting and EMS

Volunteers make up the majority of the fire service. They are willing to volunteer their time for little to no money. They wake up in all hours of the night to help those in need even though many have to go to their normal job the next day on little sleep. They volunteer countless hours to training and calls. The interesting part about volunteers is the variety of people that are firefighters, EMTs. Or paramedics. In my time of being a volunteer, I have worked with preachers, veterinarians, businessmen, nurses, blue collar workers, police officers, and also retired people.

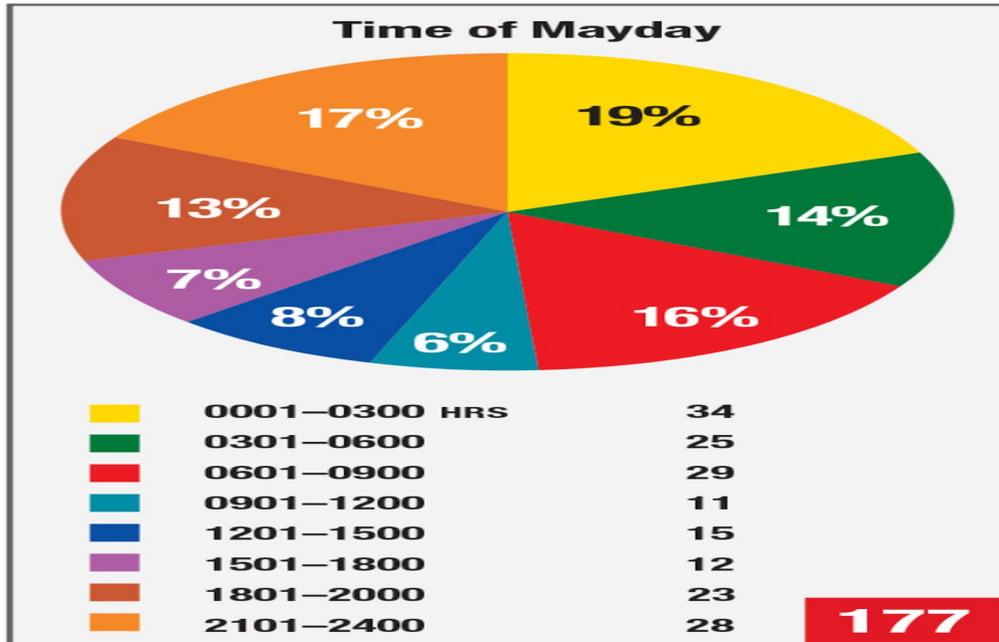
With this selfless service comes great risk. Everything that we have already discussed is largely already about volunteers just as much as career fire departments. 70% of the fire service in the United States are volunteers. Volunteers have other risks that career firefighters and EMS doesn't.

Sleep might be the number one downside to volunteering. It may sound like it's just an inconvenience but it could have risks. Career departments usually have a 24

hour shift and 48 hours off duty. If they get called in the middle of the night, they can catch up on sleep on their 2 days off work. Volunteer firefighters wake up for calls and typically have work or other obligations to do the following day. This lack of sleep can be costly on their regular occupations. If they work in a dangerous occupation, the lack of sleep can cause errors. In regular occupational safety, sleep and stress can be a cause for injuries and deaths. The National Safety Council claims that 13% of all workplace injuries are from a lack of sleep. So if that is for regular workers not getting enough sleep, think about the volunteers sleep schedule and what that could do in his/her workplace.

There was a study conducted by FireHouse Magazine's Don Abbott, Dr. Venton Bennett and Dr. Jason Bebermeir. It is called "The Mayday Project." A mayday alert is given when a firefighter is in an emergency situation and needs to be rescued. They studied everything from mayday calls over a year. They found that it was mostly bad decision making by incident commanders and firefighters working the fire head on. Although the study wasn't just involving volunteer departments, it gave good facts to back up my claim of sleep issues and lack of judgement by firefighters and incident commanders. They claim that the majority of mayday calls come during the normal

sleep or resting hours.



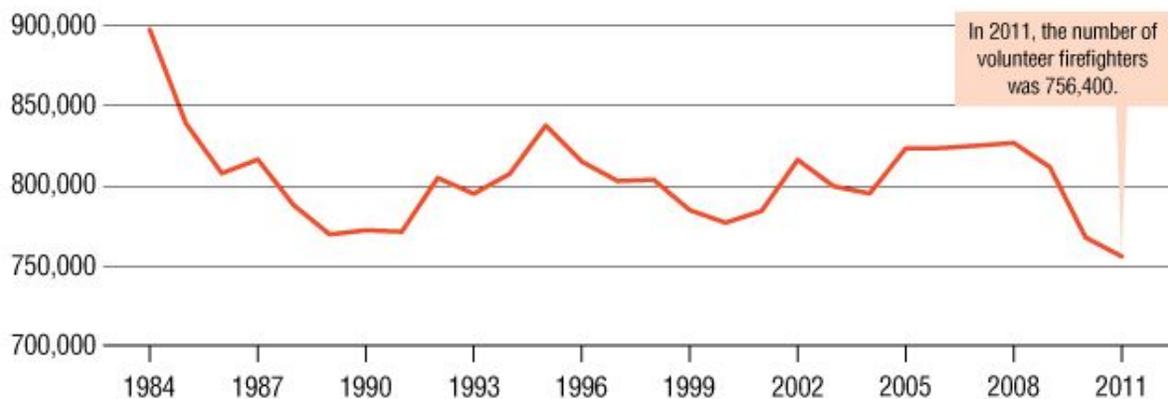
As I discussed in opening arguments, the safety culture is something that needs to change to reduce injuries and deaths. The volunteer service typically has a pretty poor safety culture. I'm not saying that most volunteer departments don't believe in safety, I'm pointing out that safety is not a number one priority in most departments and here is why.

- Low Enrollment
- Willingness
- Resources
- Cost

The volunteer service has problems with recruiting and retention. The U.S Fire Administration says that this problem has been around for decades. The problem with such a low enrollment is that the number of calls went up in the 1990's and have stayed pretty consistent since then but the number of volunteers have gone down slightly since the 1980's. This could mean that there might not be enough firefighters to put out a fire or respond to a vehicle accident. This is dangerous to the public and to the firefighters.

Number of volunteer firefighters in the US, 1984-2011

The number of volunteer firefighters in the U.S. has declined by more than 18 percent since 1984. Major factors contributing to the decline include increased time demands, more rigorous training requirements and the proliferation of two-income families whose members do not have time to volunteer. And as the average age of volunteer firefighters increases, departments are finding it difficult to attract younger members.



Source: National Fire Protection Association

I was on a call once where a harvester was on fire and ignited the whole soybean field. There was only 2 of us on the call. I was on the nozzle with no backup person and the fellow firefighter was pumping the water from the truck. We battled the fire for what seemed like 30-45 minutes before we ran out of water and had to wait about another 15 minutes for additional units to arrive. If there was an explosion or tragedy where there were only a few firefighters and no backup or units in route, it could lead to serious

injuries or death without anyone even knowing about it. On my hometown volunteer department, there is an extremely low enrollment. Annually, there is roughly 10-15 people on the entire department. I have been told there has been calls that only 1 or 2 people go on. 2 people on a call is bad but if there is only 1 person, it's very dangerous and almost impossible to work efficiently.

Because of such low enrollment in volunteer departments, safety is often overlooked. With retention rates low, it's hard to tell who will stay on the department long enough to get certified as an incident safety officer. It's also hard to be safe when there is only a couple people to answer a fire call. That is why safety should start at the individual level and be supervised by their superiors.

Willingness to be a safety officer is another factor in affecting the safety culture. We already stated that volunteers have jobs and other obligations so why would they put more responsibility on themselves to be a safety officer. Most volunteers are there to do just that, volunteer. They need not care about rising the ranks and getting more obligations and responsibilities. I've seen people turn down officer positions a lot. Another reason that some people don't want to become a safety officer is because they like being on the frontlines. They like being on the nozzle or cutting someone out of a car. You can't focus on scene safety if you aren't sitting back and watching everything before and as it happens.

Resources are supposed to be there to assist in training and on emergency calls. Volunteers lack resources at times. This is yet another reason why having a safety officer and focusing on safety is not done a majority of the time. If you don't have training materials or a place to train for performing things the safe and right way then the culture will not change. It has to be taught by seeing, doing, and achieving. Without the resources to train, there is a huge flaw in the safety culture.

The number one reason for the horrible safety culture is cost. It is estimated by the National Volunteer Fire Council that it typically costs around \$27,000 to properly train and equip a new firefighter. This cost means that corners will be cut. Old turnout gear will be reused even if it has visible flaws and defects. Cost affects everything we just discussed. If departments can't afford to pay someone, they will have low enrollment, if they can't pay them more money to be an incident safety officer, then they will not be willing to be one, and if you can't afford resources to train and teach, then you have a massive problem. Many people aren't willing to buy the materials to study for the incident safety officer certification test. Everything has a price, but safety should not be one to push to the side.

Leadership in the volunteer service is usually the firefighters who have been on the department the longest. I believe this can be an issue as well. Just because someone has been on longer than others does not mean that they are a leader. It does not mean they are more experienced. There can be young firefighters that have been on more calls than some of the older firefighters. Age and years of service doesn't mean anything important. Every volunteer is different because of their regular occupations.

Some might not be able to make a lot of fire runs while others can make a majority of the calls.

I believe that this norm of giving leadership positions away to the oldest of the department is wrong. If a person is not a leader then they will be of person of authority and/or power rather than a leader. These differences are very costly and risky. Lack of experience, leadership, and decision making are things that everyone in this profession should be aware of. Keep in mind, I'm not asking to disobey an order or do something your own way. But if it has to do with your safety or another firefighter's safety, you have the right and authority to disobey that order and stop that action to ensure that no one gets hurt or killed. The problem is, inexperienced and new firefighters will just follow orders without thinking. They are too inexperienced to know right from wrong. During their training and probationary period, new recruits will follow any order given to them. This is especially dangerous when they have bad leaders in the ranks.

The same can be said about subordinates not following orders as well. If it isn't a hazard or health and safety risk, then follow the orders given. Just because you might not agree does not give you the authority to stand down. Not following orders could place yourself in danger. They might see or hear something that you do not, that is why it is important to listen to superiors on the fireground.

Volunteer EMS is common in rural areas of the country They normally get paid per run and have to work shifts so that there is someone on call 24/7. These can be an entity of a volunteer fire department or seperate. They are usually the sole emergency

medical service in the communities. The problems with volunteer EMS is about the same for volunteer fire departments. Cost to afford ambulances and supplies in smaller communities are sometimes very difficult. There is also the problem with low enrollment and poor leadership in managing everything as well. That is why volunteer EMS is declining. Even in areas that need the services. More and more EMS departments are closing down in rural areas across the country every year.

With the closings of EMS stations means that response time to receive medical care is longer. Some response times are 20 minutes or longer in rural areas. This is bad for everyone living and working in these communities. On most fires, EMS gets called as well in case of any victims and for the firefighters working the scene. Without an ambulance being able to be on standby for every fire, it is risky for the firefighters battling the blazes. This has caused volunteer fire departments to expand and add ambulances to their fleets and recruit EMS personnel to split the cost and keep the EMS up and running.

Wildland firefighting is a beast of its own, but what about when a volunteer or mostly volunteer department has to battle a wildfire? In rural areas, a wildfire usually consists of a large field, a wooded area, or a simple brush fire. The National Fire Protection Association discovered some interesting points about non-wildland fire departments and wildfires. Note that these findings are not solely volunteer departments but nevertheless, can provide some insight in the frequency of these fires.

- During 2011-2015, local fire departments responded to an estimated average of 306,000 brush, grass, and forest fires per year, an average of 840 fires per day.
- During 2011-2015, heavy or light vegetation was the item first ignited in an average of 6,200 reported home structure fires per year. These fires caused an average of seven civilian deaths, 53 civilian injuries, and \$130 million in direct property damage.
- The vast majority of brush, grass and forest fires in 2011-2015 were caused by human activities. Leading causes include intentional fire setting, open burning of waste, smoking materials, and electrical power or utility lines.

These findings show that these fires are common around the country. These fires do not have a lot of injuries and deaths as other fires but can cause some issues. One of the main issues that these fires have for volunteers is that the departments can't afford wildland firefighting gear. The cost of turnout gear is high enough and this is an added cost that can be given up since there isn't many big forest fires in rural areas compared to small brush fires. This isn't a huge issue but turnout gear is heavy. This can lead to faster heat exhaustion. Then you have a secondary issue of firefighters taking off their turnout gear. Without turnout gear, this can lead to burns and minor injuries. A burnt tree may look like it isn't hot until your arm or hand gets pressed against it without any protection. Also, Training on wildland fires for volunteers are limited. With volunteers not training but once or twice a week, it is hard to fit in wildland firefighting

with more common incidents that they need to improve on. This leads to poor management when fighting a field fire or bigger wildfire.

From 2003 to 2015, 52 volunteers were killed responded to their station or scene in their personally owned vehicles. Many more have had injuries for POV accidents, some life threatening, or life altering injuries. One third of the POV fatalities were under the age of 21. The reasons for this is because with emergency lights and sometimes sirens, volunteers think they can drive fast. Sometimes, they get too comfortable and lose control of the vehicle. In some states, they enforce that volunteers must drive the speed limit when responding along with all other traffic laws.

The last subject for volunteer firefighting is setting standard operating procedures or protocols, otherwise known as SOP's. While every department should have these for everyday operations such as which apparatus to take out for certain calls, how many firefighters are doing a specific task, or how to handle different incidents. Safety protocols are not very well established most of the time. This is understandable in some ways because anything can go wrong at any given moment. But there should be, at the minimum, ways to handle certain situations such as mayday calls. There should be, at a minimum, a rapid intervention team to rescue a downed firefighter. This is something that every fire department needs to have and needs to train on during every training exercise. Safety is the number one priority.

Violence

Sad, but true, violence against firefighters and EMS personnel has increased in recent years. We are seeing mass shootings and other violent acts more often than we should. The fire service sees firsthand these horrible acts and some are even directed towards them. Most of the violence is mainly physical violence with punches thrown. Some are a little worse. From the 2004 Rand Institute study “Violence Against Firefighters”, “Approximately 88,000 firefighters are injured due to violence against them each year; about 2,000 of their injuries are potentially life-threatening” and that “The Bureau of Labor reports that public sector employees are four times more likely to experience assaults than private sector employees.”

When discussing the opioid crisis, I talked about the use of narcan and the effects that happens to an overdose patient when doing so. The patient comes down from their high very quickly. This can make the patient very erratic. They are addicted to these drugs and they blame the person saving their lives for ruining their high and what they seem as a waste. They normally don't even realize that they almost died because they are too angry about losing their high. When they become angry they may take it out on emergency personnel. This can become a dangerous situation if police are not on scene. The patient could have a variety of options for weapons. They could have a gun or knife that wasn't visible or use something like a needle or other medical supplies. The most common is their fists. Although the opioid epidemic is more recent and these

assaults on first responders aren't study very much right now, we can see the news reports anytime by researching violence against first responders on a web search.

There are some infamous violent and deadly acts to firefighters. The more recent attack that made national news was on Christmas Day of 2012 in Webster, New York. A man set several houses on fire and waited for firefighters to arrive on scene. Once they arrived he ambushed them with multiple guns. He shot and killed two firefighters and wounded two more along with one police officer being wounded while arriving on scene. This attack has led to fire and EMS to start wearing bulletproof vests when going to calls. Some EMS companies is starting to issue them out along with uniforms.

The September 11th 2001 terrorist attacks claimed the lives of 343 firefighters in the World Trade Centers. This was not a direct attack on firefighters or any first responder, it was an attack on all Americans. But it is important to keep in mind that everyday in this occupation could be your last and violence is yet another risk that the fire service must face.

Controls/Conclusion

I have discussed about many aspects to the fire service. So let's take a recap and then I will give opinions and research on controls to minimize almost every hazard

that has been researched in this paper. I believe that we can significantly bring down the injuries and deaths per year by adding controls. The topics discussed were

- Physical Health
- Apparatus and Struck-By Accidents
- Wildland Firefighting
- Mental Health
- Bloodborne Pathogens and Drug Overdoses
- Volunteer Firefighting and EMS
- Violence

Physical Health

The problems we have faced are easy fixes to reducing injuries and deaths. Obesity and being overweight were a cause that hurts the firefighter and coworkers as well. Firehouses need to enforce physical training while on shift. Especially if it is a paid and career department. An hour or 2 of training will be hurt anyone. There should be more healthy foods made at the firehouse. Burgers, pizza, and other junk food are just adding to the problem. Try changing up the meal to a healthier option at least one meal a day.

Minor injuries such as muscle tears or pulls, cuts, and burns are the most common injuries. To prevent muscle tears and pulls, simply stretch out every hour or so. Firefighter's muscles can get tense and tired when sitting down for a long period of time.

Get up and stretch every hour or two. With cuts, scratches, and burns, there is a simple solution; Wear your PPE. Not just one piece, all of it. Not wearing gloves or turnout jacket are probably to blame for a lot of these minor injuries since it is the more common PPE that gets tossed once a fire is controlled.

Cardiac illness and injuries are devastating to firefighters and families. We discussed the reasons why it could be such a high percentage in this occupation to suffer from and they are key to reducing the numbers. This issue is one of the biggest we have had in the past few decades. It starts by wearing your SCBA to every call that you encounter smoke or other toxic fumes. You do not get immune to smoke, it just continues to do damage. Wear your SCBA even if it seems like very little smoke. Those toxins will stay on your skin and in your nose and you will continue to be exposed. Reduce or stop smoking and it will decrease the chance of suffering a cardiac episode. When around heat or you are working hard, take a break to cooldown. Taking breaks should be done for everyone working the call, and the break times and shifts should be at the discretion of the incident commander and not the firefighter themselves to prevent them from continuing to work.

Cancer rates are very high in the fire service but as we just discussed, tobacco use should be reduced and stopped. We breathe enough smoke and toxins from fires, but smoking will only make matters worse. There should also be detox kits after every fire. Whether it be some sort of wipes or a detox sauna room, get some sort of detox to

remove the toxins off your body. Clean your turnout gear at least every two weeks or after every 20 calls.

Apparatus and Struck-By Accidents

Apparatus and struck-bys are something that happen every day. The easy fix would be to ensure that every firefighter or emergency medical provider is wearing their seatbelts or is secure in the vehicle. This is really the best control to fixing deaths from this issue. Backup cameras and back up beepers should be installed in every apparatus. There should always be an SOP to turn the emergency lights on when backing up to warn other firefighters.

Wildland Firefighting

Sleep deprivation and stress are very well known for wildland firefighters. If the numbers allow, take more frequent breaks or reduce the break time you have already established in order to ensure everyone gets some sort of rest before moving on from the location to the next. Superiors should talk to their subordinates and see where there mind is at. It can help take stress and pressure of of them.

Burnovers are so unpredictable that it is hard to control. Within minutes, fire could come rushing at you. The best controls in my opinion would be to first, research and develop better emergency fire shelters. There are materials out there that will resist thousands of degrees of heat. The next would be to keep watch of the wind direction

and have knowledge of your surroundings at all times. Know where the safe areas are and what the best possible route would be.

Smoke from wildfires can last months and these firefighters are exposed for long periods of time. There needs to be a better way to get clean air while battling the blazes. It can start by safety masks. SCBA would be too heavy and lose too much air for the amount of time spent. These masks will reduce the toxins that are being breathed in.

Mental Health

Mental health is a tricky one to control because everyone is different. Every mind is different. One way that the fire departments I have been on have used to help mental health is after every bad call, we would sit and talk about anything they wanted to get off their chest. Anything that was bothering them they could speak and everyone will listen. It can get very emotional, but it is necessary. Bottling these emotions up will only make them worse. If you need help with a mental illness or addiction, tell a fellow firefighter. Firefighters should always be looking for signs of mental health problems in everyone and should talk to their coworkers to make sure they are doing alright.

Bloodborne Pathogens and Drug Overdoses

There is hardly any controls for bloodborne pathogens except to wear the proper PPE. These will include gloves, eye protection, and a mask. It is the best way to prevent exposure to bodily fluids. Gloves could always be thicker or improved to prevent needles and other sharp objects from breaking the skin.

Volunteer Firefighting and EMS

Sleep should be a priority for volunteers. If you are on a shift system for being on call, try to get as much sleep and rest as possible in case of a call. If you are a volunteer on call 24/7, be reasonable with your sleep schedule. On busy weekends and holidays or days that you think might be busier than others, make sure you get plenty of sleep in the days leading up. Always plan ahead and be prepared. If you have work the next day, ask if you can leave as soon as you get back to your station or ask to come in the next day to clean gear and equipment. This method isn't recommended but it is a way to prevent sleep deprivation.

The culture of your volunteer department can always be improved. Assign a recruiting and retention officer to be the middle person in making sure enrollment stays up. Apply for grants and have fundraisers to make sure there are funds for equipment, gear, supplies, and personnel. Always assign a safety officer that is competent and has a good vision of the whole scene on every situation. It is recommended that the safety officer has his/her incident safety officer certification but if there are not enough funds, make sure that person is willing to do the best job possible.

SOPs for safety should always be in place. Make sure they are updated frequently as new situations always occur. Once the safety SOPs are established, give copies to all firefighters and ensure that they know them. A quiz or test during safety training will be a good way to tell if they read over them. Copies should be posted in the station and have copies of SOPs in the apparatus.

To summarize, safety should be the number one priority for any fire or EMS department. You cannot help others if you are injured or dead. There are many risks to this occupation and many hazards. There are always ways to improve safety and minimize hazards. Safety starts at the individual level. You must first make sure you are being safe. If you are not safe, you cannot help a victim or your fellow firefighters and you can put them at risk. Incident commanders should always do a scene size up when arriving on scene to see any hazards or obstacles. There should always be an incident safety officer on scene and if there is not, the incident commander can take the role or assign someone else that is competent on scene to handle the responsibilities.

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