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Reducing the Heat Emergency Risk

at Town of Addison Special Events

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Certification Statement

I hereby certify that this paper constitutes my own product, that where the language of others is set forth, quotation marks so indicate, and that the appropriate credit is given where I have used the language, ideas, expressions, or writings of others.

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ABSTRACT

The problem was that heat related emergencies at special events in the Town of Addison had the potential to overwhelm the Addison Fire Department (AFD) resources to the extent that emergency response was negatively impacted. This problem was identified by AFD members during special events with large crowds. The purpose of this research was to identify methods that the AFD could use to reduce the risk of heat related emergencies at special events held in the Town of Addison. Descriptive research was used to answer the following questions: (a) what are the contributing factors to heat related emergencies experienced at special events? (b) How are other agencies proactively addressing the prevention of heat related emergencies at special events? (c) What are other fire departments doing to prevent heat related emergencies at special events? (d) What can be done to reduce the risk of heat related emergencies at Town of Addison special events? The research incorporated two questionnaires. One was sent to members of the Texas Fire Chief's Academy to identify how other fire departments, in a similar geographic region, were preventing heat related emergencies at special events. The other was sent to AFD officers. The research included interviews with officials and AFD Chief Officers that deal with heat related emergencies at special events. Mechanisms and planning considerations were identified in the research. Public awareness through communication, planning and marketing were emphasized by some of the respondents. A list of recommendations was established to help the AFD reduce the risk of heat related emergencies at special events. The recommendations included establishing a special event program manager, working through the media, application for grant assistance, education and training for AFD and event personnel, working closely with sponsors, and installing cooling stations at pre-determined locations.

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Similar to a teacher that communicates information to students for them to learn; experience provides lessons for members of the modern fire service. It is up to the student to process that information and put it to use. Members of the modern fire service are students of the past and of the valuable experience passed on through generations. Experience provides useful information used in successful critiques and comparisons (Brunacini, 2002). Information may be used to plan, prepare for, and even prevent the risks to communities. A majority of the issues or problems encountered by fire service professionals recur and are not new (Brunacini, 2002). These incidents begin with risks to communities that may be prevented if they are identified and addressed ahead of time. Fire departments that embrace preventing risk can help to educate their communities and make an impact, demonstrating they are risk managers and are much more than simply emergency response (Crawford, 2012).

The problem was that heat related emergencies at special events in the Town of Addison had the potential to overwhelm the Addison Fire Department (AFD) resources to the extent that emergency response was negatively impacted. The purpose of this research was to identify methods that the Addison Fire Department could use to reduce the risk of heat related emergencies at special events held in the Town of Addison. Descriptive research was utilized to answer the following research questions: (a) what are contributing factors to heat related emergencies experienced at special events? (b) How are other agencies proactively addressing the prevention of heat related emergencies at special events? (c) What are other fire departments

doing to prevent heat related emergencies at special events? (d) What can be done to reduce the risk of heat related emergencies at Town of Addison special events?

BACKGROUND AND SIGNIFICANCE

The Town of Addison is a predominately commercial and urban community located in the Dallas County, Texas metroplex area. There are several pockets of high density residential housing complexes coupled with middle to high income single family dwellings (O'Neal, 2012a). Settled in the late 1800's, the community was originally known as Peters Colony (Eads, 2001). The name was changed to Addison in 1902 when the town was named after Addison Robertson, a local farmer and Civil War veteran that served as the postmaster (O'Neal, 2012a). The city was incorporated as a town in 1953, followed by an official name change (Eads, 2001). The town is approximately 4.35 square miles and serves a residential population of nearly 15,000. However, there are often over 100,000 people in the town at any given time due to the numerous commercial buildings, high occupancy hotels, restaurants and busy general aviation airport. Addison was one of the first localities in the metro area to sell liquor and this spurred explosive growth in the 1970's (Eads, 2001). Presently, it is the home of target hazards that include the Addison Airport (ADS), a 1600 foot tunnel running traffic underneath the runway, a Dallas Area Rapid Transit bus terminal and railroad.

The town is protected by the Addison Fire Department (AFD), a career organization with fifty-two uniformed personnel. Crews work on three different shifts, each for twenty-four hour tours. The minimum staffing on each shift is thirteen personnel. The department is a full service agency providing fire suppression, emergency medical service (EMS) as an advanced life support (ALS) agency, aircraft rescue firefighting (ARFF), rescue, fire prevention services and

public education (O'Neal, 2012a). The minimum primary response units at the AFD include two engine companies with three personnel each, two medic units with two personnel each, a truck company with two personnel and a battalion with one personnel. In order to provide effective response forces for structure fires or significant events, the AFD relies on automatic mutual aid from the neighboring fire departments. For special events in the town, the department staffs a third medic unit, a special event cart, and when required, a third engine company to meet the needs of the community and large influx of patrons.

The town prides itself in offering a high quality of life to citizens and guests. Employees of the town are taught a philosophy of finding a way to say yes to service requests rather than responding that something cannot be done (O'Neal, 2012a). AFD members learn their mission, vision and values statements and pledge that "customers are our number one priority" (O'Neal, 2012b, p.3). Along with a commitment to customer service, the town is home to over one hundred eighteen acres of manicured parks and green space. Addison is widely known in the region for its special events, where citizens and visitors from all over attend and enjoy a variety of entertainment and activities (Addison Texas, 2012a). The events hosted by the town include nearly 30 weekend special events including the nationally acclaimed annual events of Taste Addison in May, Kaboom Town on July 3rd, Oktoberfest in September and Worldfest in October (O'Neal, 2012a). There are several other events scattered throughout the calendar year that attract large crowds of all ages with carnivals, midways, artistic displays, cooking and concerts (Addison Texas, 2012b). The majority of the special events are held outdoors at a park dedicated as the Addison Special Event Site. The park is nestled in a large multi-family residential community on the east side of the airport. Situated in an urban area in north Texas, the town is characterized as having hot, humid summers and is located in a sub-tropical climate zone

(O'Neal, 2012a). According to monthly averages, July is the warmest month of the year with an average high temperature of 96 degrees Fahrenheit (The Weather Channel [TWC], 2012). Record highs have been recorded well over 100 degrees (F) from April through October. The large crowds attending the planned special events, combined with the region's high heat and humidity, result in heat related medical incidents that must be mitigated by emergency response personnel. Although special events in the town are coordinated through many of the departments, emergency management is an AFD responsibility and is at the direction of the Fire Chief (O'Neal, 2012a).

Addison has hosted special events for nearly thirty years. Events have been added or deleted based on attendance, popularity and opportunities to promote a pleasant experience. Barbara Kovacevich (personal communication, June 22, 2012), the director of special events for the Town of Addison, estimated the attendance to range from 25,000 to 75,000 in the special events site during events and during Kaboom Town, as high as 350,000 to 400,000 additional visitors throughout the town. In north Texas, the events that are held in the late spring, summer and early fall experience the highest temperatures. Addison Fire personnel staff special events for emergency medical service (EMS), fire prevention and inspection. There two areas at the event site designated for EMS and one cart used to move patients. Most emergencies are handled on scene and those needing to be transported are moved to a designated location and transferred to a responding medic unit. Only two to three patients are able to be treated at one time with the resources available on scene. When heat related emergencies occur in these large crowds, along with other incidents, there is a potential for the resources to be overwhelmed. Each special event has seen an increase in patrons of between five to ten percent annually,

largely attributed to advertisement and word of mouth (B. Kovacevich, personal communication, June 25, 2012).

This research paper was completed following the guidelines established by the National Fire Academy Executive Fire Officer Program (National Fire Academy [NFA], 2011a). The problem presented in this paper was linked to Unit 1 of the Executive Analysis of Community Risk Reduction course titled "The Executive Fire Officer as a Community Risk-Reduction Strategist" (NFA, 2011b, p.1-1). This unit identified the benefits associated with successful community risk reduction. Common elements of successful risk reduction efforts were discussed. The unit also explained how the Executive Fire Officer has the responsibility to be dedicated and involved with the community risk reduction process. Finally, it was emphasized that a lack of effort to address community risks can have a negative effect on a community, organizations and leadership (NFA, 2011b).

The United States Fire Administration (USFA)(2010) has established five operational goals that are noted in a strategic plan for fiscal years (2010-2014). The problem addressed in this paper was related to the first two goals: "reduce risk at the local level through prevention and mitigation. Improve local planning and preparedness." (USFA, 2010, p.13).

LITERATURE REVIEW

A literature review was completed to find out what other authors have to say about heat related emergencies at special events. The review was initiated at the Learning Resource Center (LRC) on the campus at the National Fire Academy (NFA) in Emmitsburg, Maryland in April, 2012. Additional information was gathered from a personal collection of resources, visits to a local library at Collin College in McKinney, Texas, the purchase of resources on Amazon.com,

internet searches and by studying the limited information available on the common computer drive at the AFD. Search terms used on internet searches included special events, mass gatherings, crowd behavior, and heat emergencies.

Contributing Factors at Special Events

Mathews (2008) defines a special event as "a gathering of human beings, generally lasting from a few hours to a few days, designed to celebrate, honor, discuss, sell, teach about, encourage, observe, or influence human endeavors."(p. 2). He goes on to explain that the customer or guest may view this as an opportunity to experience something outside of an everyday experience (Mathews, 2008). Special events and mass gatherings are terms that are sometimes used together. Lombardo, et al. (2008) defines mass gatherings as events that are preplanned, public and attended by more than twenty-five thousand people. The Federal Emergency Management Agency [FEMA](2005) takes the emphasis off the number of people attending the event and focuses on the community's ability to respond to it. Mass gatherings are considered a subset to special events (FEMA, 2005).

Injury and illness are more prevalent at large gatherings of people as compared with a community with a similar population (Tsouros & Efstathiou, 2007). The authors explain that weather is a contributing factor to heat related emergencies, particularly if the event is held outdoors (Tsouros & Efstathiou, 2007). Direct exposure to sunshine during a special event is a factor that increases body temperature, but the combination of high temperature and high humidity are a large cause of the onset of heat related emergencies (National Weather Service [NWS], 2012). Temperature and humidity are compared and categorized into heat index values. These values are the apparent temperature or how it feels to a person in degrees Fahrenheit (NWS, 2012). The author explains that exposure to direct sunlight may increase the heat index

up to fifteen degrees. Depending on the event, time of day and weather, the lack of available air conditioning contributes to heat related incidents (Steffen, 2012). Steffen (2012) states there was an incident that took place at the 1985 Hajj, a large special event and annual Muslim pilgrimage, where two thousand cases of heat stroke were reported and the result was over one thousand deaths within a few days. Steffen (2012) supports that heat stroke is one of the largest causes of death at large gatherings of people. The lack of available air conditioning or shade contributes to heat emergencies when the visitors are not acclimatized to the environment (Centers for Disease Control and Prevention [CDC], 2006). Another environmental factor that plays a part in the heat experienced at special events is known as the "urban heat island effect" (Klinenberg, 2002, p.16). Klinenberg (2002) states that in the urban environment, the concrete buildings and high volume of pavement trap the heat and actually increase the temperature around the city. Simply being in an urban environment is a contributing factor associated with a higher mortality rate during a heat wave (American Red Cross, 2009). The infrastructure of a city, with a high concentration of asphalt and concrete, leads to more severe heat conditions by trapping heat and pollution (Tsouros & Efstathiou, 2007). Special events that are held in urban environments may experience reduced air flow due to tall buildings and increased heat generated from vehicles in high traffic areas (United States Environmental Protection Agency [USEPA], 2006).

In addition to the environmental factors, heat related emergencies at special events are experienced due to several factors in relation to the crowd attending (Tsouros & Efstathiou, 2007). The authors provide information that the crowd and individual health status, average age, behavior, clothing and use of drugs or alcohol may all have an impact on how individuals are affected by their environment. Attendees that are over the age of sixty-five are likely more prone to the effects of heat and do not adjust as well to extreme changes in temperature (CDC, 2012).

They are also more likely to have a chronic medical condition requiring prescription medication, both contributing to heat related emergencies (CDC, 2012). Some medical conditions such as diabetes, obesity, high blood pressure, heart disease, and lung problems cause people to be more vulnerable to the heat. Pregnant women may also feel adverse effects of high heat and humidity at these events (USEPA, 2006). Additionally, the medications taken to treat these conditions have a tendency to negatively affect thermoregulation in the body (Limmer & O'Keefe, 2009). Some of the common medications that are known to interfere with the body's ability to deal with heat are antipsychotics, tranquilizers, tricyclic antidepressants, antihistamines, anitparkinsonian agents and sleeping pills (American Red Cross, 2009). Young children are also unable to regulate extreme temperatures and may be on medication as well and their presence is also a factor contributing to heat related emergencies (CDC, 2006). Pre-existing dehydration may hasten the effects of the heat (Limmer & O'Keefe, 2009). A lack of drinking water and the consumption of alcohol and caffeine all contribute to dehydration (McNeill, 2012). Tsouros & Efstathiou (2007) emphasize that at large events, it is important for guests to be cautious of their alcohol consumption and to drink plenty of cool water to prevent negative public health effects related to the heat. Excessive alcohol may impair judgment and increase the exposure to the heat, as well as dehydrate the body because it is a diuretic (USEPA, 2006). The simple acts of drinking water and limiting alcohol consumption reduce the chances of a heat related illness (CDC, 2006). Water provides the human body the ability to perspire and regulate body temperature. A lack of perspiration in the heat causes body temperature to rise (USEPA, 2006). The clothing that is worn by visitors to special events may contribute to heat related events. Light-colored, lightweight, loose-fitting cotton or linen clothing provides the coolest option and is recommended for mass gatherings or special events in the heat (Tsouros & Efstathiou, 2007).

The CDC notes that one way to prevent heat related illnesses is to dress properly for the event (CDC, 2006). Dark colored or heavy clothing can limit the amount of perspiration that may be evaporated, resulting in higher body temperatures (USEPA, 2006). Finally, Krebs (2001) offers that a contributing factor to heat related emergencies is the amount of planning and intelligence that went into the special event. The author warns that organizations should learn from experience and evaluate what problems were encountered in previous events that were similar in size or activity (Krebs, 2001).

Proactive Prevention by Other Agencies

Agencies that deal with a large volume of people at gatherings must realize there a potential for expected and unexpected risks. Anytime a large number of people are brought together for a game, concert, or other gathering, the possibility exists for an emergency (Stone, 2012). The author explains that during a special event, the venue transforms into a city, at least on a temporary basis. He goes on to stress the importance of being prepared for the potential problems and catastrophes that could occur when crowds and limited space are combined (Stone, 2012). One group that deals with a large volume of people under different types of conditions is the United States Military. At Goodfellow Air Force Base in San Angelo, Texas, the key to prevention of heat emergencies is education (Melendez, 2009). The base incorporates a proactive approach through the use of a Heat Stress Prevention Program. The program includes a notification via e-mail and the display of different colored flags on the base that coincide with specific environmental conditions (Melendez, 2009). Senior Airman Melendez states that the flags colors indicate the severity of the conditions with white being the least severe, then green, yellow, red and black being the most severe. Information is provided to all visitors and military personnel in the form of training news bulletins and the Goodfellow Air Force Base Web site

(Melendez, 2009). The Unites States Marine Corps (USMC) has an order from the Commandant of the Marine Corps that specifically explains the Marine Corps Heat Injury Prevention Program (Department of the Navy, 2002). This document explains that acclimatization to the environment is important. It further explains the importance of hydration and the adverse effects of humidity. The USMC uses flags to display the environmental conditions and relies heavily on training and education for military personnel (Department of the Navy, 2002).

One of the most famous special events or mass gathering for an event is the Olympic Games. Committees and groups work to prevent health risks by using past experiences and emergency planning (Tsouros & Efstathiou, 2007). The authors claim that experiences from previous Olympic venues provided a basis to protect and promote public health, including heat related emergencies. The Olympic committees had success in preventing negative effects of high temperatures and heat waves by emphasizing awareness and preventive activities (Tsouros & Efstathiou, 2007). Pamphlets, brochures, and postcards in multiple languages were distributed in a variety of ways prior to the Olympics. The information was targeted to websites, hotels, transportation services and mass media outlets and kiosks to name a few (Tsouros & Efstathiou, 2007). The authors suggest that important preventive and precautionary information included recommending light colored, light weight clothing, wide brimmed hats, avoiding alcohol and the consumption of water were included. They also stated that the information was presented in multiple formats to appeal to people of all ages and cultural backgrounds (Tsouros & Efstathiou, 2007).

In another proactive approach, Walt Disney Parks and Resorts claim that their safety department continually does safety audits and surveys to search best practices at their theme parks (Pressler, 2002). Heat stress information is presented to all of the Disney Cast members

through awareness courses. Pressler (2002) explains information and preventative measures are disseminated through postings, local area newspapers and publications.

Record breaking heat at the Indianapolis 500 at the Indianapolis Motor Speedway (IMS) provided an opportunity for the Speedway to prevent heat related emergencies (Davies, 2012). The IMS and officials spent time urging people to take advantage of shade and air conditioning as much as possible. There were numerous misting stations at the IMS that were located sporadically around the entire facility and indicated on a map (Davies, 2012). There was a concern for the protection of the fans from the heat and the IMS tried to inform the attendees to avoid heat related emergencies and have a good experience at the event.

The Ballpark in Arlington, Texas is home to the National Baseball League team, the Texas Rangers. The number one complaint of attendees is the Texas heat (Bowman, 2011). Bowman (2011) says there have always been requests to put a roof on the Ballpark but it has not been cost effective. He indicated that in response to the heat related emergencies and concerns for the fans, the Rangers are making some changes to the facility. The children's area will be moved indoors and the area behind centerfield will be altered to create some concession areas and more air conditioned space (Bowman, 2011).

Finally, in Connecticut, a high school graduation ceremony with one thousand people gathered outdoors, ended with fifteen people being treated and transported to the hospital for heat related emergencies (Hernandez & Stacom, 2012). Immediately following this event, another high school in Connecticut took proactive measures to protect the safety of the student and guests at another graduation ceremony (Fairfield Citizen, 2012). In a proactive approach, the school provided bottles of water for attendees, posted signs advising of air-conditioned rooms nearby, and sent special notices home with students. The notices advised students to walk

quickly to speed up the ceremony, wear light colored and light weight clothing, and to unzip their commencement gowns when needed to keep cool (Fairfield Citizen, 2012).

Summary

The literature review influenced by this research advocates that proactive measures to prevent heat emergencies are important for large gatherings of people or special events. The literature was consistent in indorsing hydration, shade, air conditioning, and recognizing contributing factors inherent with age and medical conditions. The importance of planning, preparation and learning from experience was emphasized. Additionally, it was recommended to target the various ages and cultures of the people attending the events with reminders and methods to prevent heat related emergencies.

PROCEDURES

The research was conducted as a result of a recognized hazard associated with patrons experiencing heat related emergencies at special events hosted by the Town of Addison. A problem statement, purpose and research questions were developed to begin the research. In addition to the literature review, questionnaires, interviews and a personal communication were utilized. Questionnaires (Appendix B) (Appendix E) were developed using a survey constructing engine available on-line called surveymonkey.com ("SurveyMonkey", 2012). The Texas Fire Chief's Association (TFCA) is an active organization that emphasizes positive leadership and ethical standards. The TFCA makes available a weekly newsletter titled "The Friday Report" (Appendix A) and provides updates on current events of the association, State of Texas and fire training resources. In the June 29th, 2012 edition of "The Friday Report" (Appendix A), a link was posted to a questionnaire titled Heat Related Emergencies at Special

Events (Appendix B) to assist with this study. The questionnaire was intended for fire departments other than the AFD to provide an outside perspective of problems and prevention for heat related emergencies at special events. The questionnaire was closed on July 13th at 2:13 pm with forty seven participants having completed it. Respondents were to be eliminated from the questionnaire if they answered question #1 (Appendix B) that no special events were hosted in the community that they served. One hundred percent of the respondents indicated that their communities did host special events. None of the responses were eliminated in this questionnaire as they were all useful. The questionnaires were incorporated and analyzed because their communities hosted special events and their data would provide information relative to their perspective. The questionnaire was comprised of ten questions that related to special events, heat related emergencies and proactive prevention measures used by other agencies (Appendix B). The audience was selected based on the geographic location and common considerations pertaining to environmental heat.

A second questionnaire (Appendix E) was submitted to AFD officers only. The five question questionnaire was distributed internally via department e-mail and was titled Heat Related Emergencies at Special Events. A total of twelve officers received the questionnaire request (Appendix E). One AFD officer was off on extended injury leave and a copy of the questionnaire was also sent to the author of this research. These two were not completed and were not utilized in the analysis. Ten AFD officers completed the on-line questionnaire. The questionnaire was designed to solicit responses and gain the AFD officer's perspective on heat related emergencies specific to special events hosted in the Town of Addison. An e-mail was sent on Wednesday, July 11, 2012 and a completion date was set for July 24th (Appendix E). All responses were submitted by July 23rd and the questionnaire was closed at 9:01 am. The

audience was selected because they are the formal leaders in the organization and are most familiar with the challenges and capabilities of the AFD. The officers were able to draw from their own personal experience and knowledge base. They identified the potential for heat related emergencies to overwhelm resources and actions that could be taken by the AFD to reduce the number of these emergencies at special events. The questions were multiple choice questions, yes/no, and fill in the blank. The responses to the fill in the blank question are included in question #5 (Appendix F).

Interviews were conducted with selected fire department officials that the author knew had extensive experience with special event planning and operations. Each interview with external fire department officials utilized the same template and their responses were documented (Appendix D). Dallas Fire Rescue (DFR) Section Chief, Tami Kayea (personal communication, July 10, 2012) provided expertise in dealing with heat emergencies. Secondly, the Fire Chief of the Davenport Fire Department (DFR) in Florida, Stuart McCutcheon (personal communication, July 11, 2012) explained challenges his department faces with special events and heat emergencies. Another resource utilized was the Emergency Medical Services Chief of the Reedy Creek Fire Department (RCFD), Stan Paynter (personal communication, July 23, 2012). Information was also obtained during an interaction with Christopher Gay, Captain (personal communication, July 24, 2012) with the Dallas / Ft.Worth (DFW) Airport during a demonstration of some DFW Airport apparatus and regional training at the Addison Fire Department Fire Station One.

Interviews with John O'Neal, AFD Fire Chief (personal communication, July 12, 2012) and Chris Kellen, AFD Training/EMS Chief (personal communication, July 12, 2012) were permitted to gain perspective from their experience and knowledge pertaining to the organization

and town. Personal communication with the Town of Addison Special Event Director provided information on attendance trends at these events. Both of these interviews utilized templates and the answers were documented (Appendix G).

There were limitations associated with the research. There are several variables that contribute to heat related emergencies and not all agencies are challenged with the same ones. An external questionnaire was distributed (Appendix B) but the number of agencies that received the request in unknown. It is also possible that more than one member of the same department received the questionnaire if they are members of the Texas Fire Chief's Association. The questionnaire was intended to be anonymous and the link could have been e-mailed to others. The questionnaire was only solicited to departments in the State of Texas and was not sent nationwide, exposing another possible limitation. The questionnaire intended for AFD officers (Appendix E) was only able be utilized by personnel that were on duty and able to check departmental e-mail during the time period given. There was a limitation in that one officer was off duty with an injury at the time. It is possible that some officers may not have wanted to expose any weakness in the organization and did not provide much information. It is also possible that officers felt rushed due to other demands or interruptions that may have occurred during their response to the questionnaire. A limitation may exist in that some officers may have a lack of concern in this specific subject matter.

RESULTS

The descriptive research method of research was utilized to help identify methods that the AFD could use to reduce the risk of heat related emergencies at special events held in the Town of Addison. The literature review provided understanding to two of the research questions. The

first research question was: (a) what are contributing factors to heat related emergencies experienced at special events? It was learned that although special events are comprised of large numbers of people, the importance lies in understanding the community's ability to respond and mitigate incidents at the event (FEMA, 2005). Climate has a major effect on heat related emergencies and poses challenges for communities to overcome. Elevated heat and humidity are the primary catalysts for heat related emergencies (NWS, 2012). Klinenberg (2012) emphasized that special events held in urban environments has an increased potential in heat related emergencies. Age, health status, medications, behavior, clothing, drug and alcohol use are all contributing factors identified in the literature review (Tsouros & Efstathiou, 2007). Additionally, it was found that the planning and intelligence gathered for the special event ahead of time were critical to prevent putting patrons at risk (Krebs, 2001).

The second research question addressed was: (b) how are other agencies proactively addressing the prevention of heat related emergencies at special events? Stone (2012) explained the importance of prevention by stressing that anytime crowds are brought together for any venue, the potential exists for emergencies. There were also recommendations on using education to promote public health and an emphasis on communicating to the public using methods that would transfer to audiences of different ages and cultures in attendance (Tsouros & Efstathiou, 2007). It was recommended that information on the use of water, light clothing, sunscreen, and cooling stations be promoted or advertised early and often. Shade and air conditioning are to be encouraged and provided as much as possible (Davies, 2012). The venue for the special event needs to be prepared and possibly even remodeled to keep up with the demands of the crowds and patrons. The literature emphasized the importance of a proactive approach to reduce the risks associated with heat emergencies at special events.

Research question (c) was answered through the use of a questionnaire, interviews and personal communication. The question addressed was: (c) what are other fire departments doing to prevent heat related emergencies at special events? The External Fire Department Questionnaire (Appendix B) was sent out to determine how other fire departments address the prevention of heat related emergencies at special events. Of the forty-seven responses, 100% indicated that their communities hosted special events. None of the responses indicated that there events were held indoors, however 51.1% were shown to be held both indoors and outdoors. The other half, 48.9%, revealed that their special events were held outdoors. There was a fairly even distribution of age groups represented to have attended events. One hundred percent showed to have adults present, 95.7% teenagers, and 91.5% for both children and senior citizen categories. Of the forty-seven departments that responded, thirty-eight have special events with alcohol on site. Less than 20% are alcohol free. Nearly sixty percent responded that their attendance is between one thousand and twenty-five thousand people. When asked if their departments respond to heat related emergencies at special events, 95.7% indicated that they did. Just over ten percent showed to have greater than ten heat related emergencies at one special event. Seventeen percent had six to ten heat related emergencies. Over seventy five percent responded that their organization provided shade structures to prevent heat related emergencies. Twenty-six of the departments sold bottled water and twenty-three set up cooling stations. Fourteen percent use misters and eleven percent use large cooling fans and air conditioning. Six percent responded that their organization does nothing towards prevention. Most of the respondents indicated that they do not supply any special equipment or resources to the event site for prevention of heat emergencies. Nearly twenty percent did and included specific examples in question #9 (Appendix C). There was almost an event split regarding communities that have an

ordinance requiring the presence of emergency personnel. Of the forty seven departments that responded, twenty-two do require the presence of emergency personnel at special events and twenty-three do not. The remaining two departments did not know.

An interview was requested and permitted via telephone with Dallas Fire Rescue (DFR), Emergency Medical Services (EMS) Section Chief, Tami Kayea (personal communication, July 10, 2012) and the answers documented (Appendix D). Chief Kayea stated that DFR has learned lessons in the past and worked with the city to pass an ordinance requiring any special event in Dallas to utilize DFR for EMS. She accounted for events when there were a number of heat related emergencies that taxed their resources and provided challenges for even a large organization like DFR. They proactively applied for and were awarded a 230,000 dollar grant to use towards tents, generators for air conditioners, and portable evaporation coolers. Chief Kayea stated that they try to work with the different venues to provide air conditioning and shade, but when needed, can provide fans, tents, air conditioners and misters to the location. She also said that it is very effective when education can be provided to patrons prior to the event (Appendix D).

An interview was also requested and permitted via telephone with Fire Chief, Stuart McCutcheon (personal communication, July 11, 2012) of the Davenport Fire Department in Florida (Appendix D). Chief McCutcheon emphasized the importance of education. He stated that his community has an annual influx of twenty percent of retirees each winter. They experience heat emergencies, primarily with the elderly population. To be proactive in prevention, Chief McCutcheon's organization provides air conditioning and shade near the refreshment areas. His organization also works to provide reminders of heat emergency prevention on the event brochures.

A third interview was requested and permitted with Mr. Stan Paynter (personal communication, July 23, 2012), Chief of EMS with the Reedy Creek Fire Department (RCFD), Florida (Appendix D). Chief Paynter's organization is responsible for responding to the Disney World theme parks. He estimated that of the twenty-five to thirty medical calls a day in the summer months, eighty-five percent are related to heat emergencies. Proactive prevention is done by planning ahead, providing educational materials to the public, monitoring the event closely to regulate crowds, providing misting and cooling stations.

The question, regarding what other fire departments are doing to prevent heat related emergencies at special events, was also addressed in a personal communication with DFW Airport's Captain Christopher Gay (personal communication, July 24, 2012). He provided a classroom lecture and a hands-on demonstration of DFW's Mobile Ventilation Unit. This included facts regarding the availability of the unit as a portable cooling station for large crowds with the capability to increase air flow and mist extensive areas quickly. DFW is able to staff and provide the unit on a regional basis for many uses, however one advantage of the unit is to be able to cool off a large crowd when the heat and humidity are a problem.

Research question (d) was answered through the use of a questionnaire and interviews. The question addressed was: (d) what can be done to reduce the number of heat related emergencies at Town of Addison special events? The Addison Fire Department Officer Questionnaire (Appendix E) was sent out to determine what the leaders of the organization saw as potential effective ways for the organization to reduce the risk of heat related emergencies at special events. Ten AFD officers were surveyed. Forty percent of them have worked more than fifteen special events during their careers. Seventy percent of the officers reported that there are typically five to ten heat related emergency patients at special events in Addison. One hundred

percent of the officers recognized that there is potential for AFD resources to be overwhelmed by patients at these events. One hundred percent saw room for improvement in the AFD resources and equipment at the event site to reduce heat related emergencies. In question #5, officers responded with actions that could be taken by the AFD to reduce the heat emergency risk for special event attendees (Appendix E). Responses included cooling stations, education, misters, limiting alcohol consumption, opening additional buildings with air conditioning, and available water stations encouraging hydration.

An interview with AFD Fire Chief, John O'Neal, (personal communication, July 12, 2012) was requested and permitted in person at the Addison Fire Department (Appendix G). Chief O'Neal stated that the AFD could be more proactive with education by messaging the public prior to and during events. He indicated the AFD could explore grants to assist with funding for misters and other cooling devices. Chief O'Neal was in favor of working with sponsors to provide available water for patrons. He recognized the opportunity to improve communication with the event sponsors, organizers and event planners in an effort to reduce risk at special events.

Additionally, an interview with AFD Deputy Chief of Training/EMS, Chris Kellen, (personal communication, July 12, 2012) was requested and permitted in person at the Addison Fire Department (Appendix G). Chief Kellen emphasized that patient care taxes the limited available resources that are provided at the event site when there are multiple patients. He pointed out an example of an event called Oktoberfest that occurred in 2005 in which there were over eighty cases of asthma treated. There was not enough staff or medical supplies on site and mutual aid resources were called in. He sees heat related emergencies as something that could be better prevented by increasing communication with patrons and by providing cooling stations

throughout the area. Chief Kellen stressed that the fire department should be kept in the loop with the coordination and planning well ahead of the special event. He said water is usually available on site but it is not always free and increasing the number of water fountains would contribute to the water intake of patrons. Finally, he noted that the air conditioned conference center located near the Addison special event site is commonly open only for VIP guests and not to the general population. He felt that having an area that people could escape the heat for several minutes would contribute to the decrease in risk factors.

DISCUSSION

The literature review provides a variety of factors that mesh together to compound and contribute to heat related emergencies at special events. Mathews (2008) suggests that special events tend to provide people an outlet to experience something other than ordinary everyday events in an environment with a large number of people. Lombardo, et al. (2008) categorizes events by a specific number of people and mentions they should be preplanned. FEMA (2005) disagrees that the number of people is the emphasis and focuses on the ability to respond to emergencies at events of this nature. Tsouros & Efstathiou (2007) explain large crowds at gatherings and events experience more illness and injury than communities with similar populations. They also point out that large crowds may be made up of individuals that differ in health status, age, and behavior such as drug or alcohol use. All of these are factors that contribute to heat related emergencies (Tsouros & Efstathiou, 2007). Data recorded in the external fire department questionnaire (Appendix B) supports that most events allow alcohol consumption. The Centers for Disease Control and Prevention (2012) clarifies the increase in risk due to age and medical conditions. Steffen (2012) recommended that air conditioning would

be helpful when the temperatures are high because visitors are not always acclimatized to the heat. The National Weather Service (2012) supports this information by suggesting avoiding direct sunlight during periods of high heat and humidity. Klinenberg (2002) defines the "urban heat island effect" as a contributing factor to heat related emergencies (p.16). Tsouros & Efstathiou (2007) agree and show that outdoor events contribute to the environmental risk factors of heat and pollution. The external questionnaire (Appendix B) reveals that half of the events are exclusively outdoors. An additional factor is simply a lack of drinking water or a failure to stay hydrated (McNeill, 2012). When patrons consume alcohol or caffeine instead of water, it causes dehydration. Some people come to events that are already dehydrated and may be impacted by the heat and humidity more rapidly than others (Limmer & O'Keefe, 2009). Interviews (Appendix D)(Appendix G) and Krebs (2001) agree with Lombardo (2008) that a lack of preplanning is a factor that could contribute to a higher number of heat related emergencies. The implication for the AFD is to recognize the factors that are predictable and that planning ahead may help to reduce the risks associated with these factors. In summary, the data suggested information for event planners, responders and the general public to keep them aware of why people may be vulnerable to heat related emergencies at these events.

The literature said that it is important to be prepared and recognize the potential that exists for emergencies when there are crowds or gatherings of people (Stone, 2012). The military agrees and goes on to provide examples of communication, training and education used to address the prevention of heat emergencies at events (Melendez, 2009). Tsouros & Efstathiou (2007) identified that educating the public is effective and proactive way to prevent heat related emergencies and is a method selected and utilized when preparing for the World Olympics. Pressler (2002) and Davies (2012) agreed that providing information to patrons that

inform them of measures to prevent heat related emergencies are effective and demonstrate a proactive approach to prevention. Hernandez & Stacom (2012) shared the results of a lack of properly communicating risks to the public that ended in several people being overcome by the heat. The implication for the AFD is to be involved with educating the public of risk factors and recognize opportunities to communicate in a useful format. In summary, fire departments should learn from agencies that deal with a large volume of people on a regular basis, and choose best practices to proactively address prevention of heat related emergencies.

The external questionnaire used to determine what fire departments, other than AFD, are doing to prevent heat related emergencies at special events, indicated that all agencies represented host special events in their communities (Appendix C). The interviews with other fire department supervisors and the data show that most fire departments respond to heat related emergencies at these special events. The questionnaire supplied results that other fire departments use a wide variety of methods towards prevention of heat emergencies (Appendix C). Interviews with department supervisors and specialists agreed with the use of large cooling fans, misters, bottled water, air conditioning and shade (Appendix D). A commonality in all information gathered was the use of media and educational materials to keep people alert and aware of the potential for the adverse effects of heat and steps to take to avoid them. It was revealed in the questionnaire that shade structures were the most common item supplied by fire departments in effort to prevent heat related emergencies (Appendix C). The interview participants noted that their departments provided several items and gave specific examples (Appendix D). This implies that the AFD has an opportunity to provide equipment and resources during special events such as tents, misters, fans and cooling stations that would help reduce the risks of people suffering heat related emergencies at special events. It also implies that the

media is an effective tool in prevention and could be utilized by the AFD. In summary, fire departments have found ways that they can contribute to the safety of their community by taking an active role in education and by providing means for people to reduce risks associated with the heat at these events.

The officers that participated in the AFD Officer Questionnaire (Appendix E) agreed that at special events hosted in the town, there are at least five to ten patients that are treated for heat related emergencies. This number does not include the other calls for service that occur simultaneously at the event site. The survey of the officers (Appendix E) and the interviews of the Chief Officers (Appendix G) both revealed a potential for the AFD resources to be overwhelmed by patients at special events. They also all agreed that there is more the AFD could do to reduce risk factors. The data supports the use of large cooling fans, misters, air conditioners and drinking water towards prevention. All participants were supportive of providing cooling stations or areas to provide relief from the heat. Emphasis was placed on communication, preparation and education from the Chief Officers (Appendix D). The implication for the AFD is that it will provide a better service by preventing emergencies than only responding to them as they occur. In summary, the AFD has increased awareness in the area of prevention for heat related emergencies at town hosted special events.

RECOMMENDATIONS

A list of recommendations for the AFD has been created and is grounded in this applied research project and the discoveries. The following recommendations are proposed to assist the leaders of the AFD in meeting the community and organizational needs by proactively working to reduce the risk of heat related emergencies at the Town of Addison special events.

Recommendation one: Establish a special event program manager in the AFD to work closely with event planners and promoters and offer health and safety considerations that may be utilized in the prevention of heat related emergencies. With better coordination and early involvement in planning meetings, the AFD considerations for each event may be more standardized and efficient. The information in the planning sessions will help plan for appropriate staffing levels for predicted attendance.

Recommendation two: Promote public health, specifically heat related emergency prevention through the media. Notices may be included in flyers, brochures, posters and pamphlets through the town marketing coordinator. Include safety messages on the town website, local news and radio broadcasts that encourage people to attend and have fun, but to do it safely. Messages should be appropriate for the crowd attending the specific event. Utilization of a public announcement at the site and a message on the large digital board at the entrance are also recommended. These should be simple and brief messages.

Recommendation three: The special event program manager should inquire for federal grant assistance in the purchase of materials and equipment that could be utilized to protect large crowds from heat such as tents, large evaporator fans, misting stations, and air conditioning. Chief Kayea (personal communication, July 10, 2012) provided a good example of a large grant awarded to Dallas Fire Rescue in which the supplies may be utilized for large events and have multiple applications for use (Appendix D).

Recommendation four: It is recommended that the air conditioned buildings that are owned by the town and surround the special event site be opened to the general population of attendees when the heat index is at a specified level. This provides opportunity for patrons to get out of the heat for a few moments. Signage should be hung to increase awareness.

Recommendation five: It is recommended that the program manager conduct periodic training with fire personnel on the proper set up of the cooling stations, and coordinate training with DFW Airport Fire Department in the event the Mobil Ventilation Unit is needed at an event. Educate and require AFD personnel on site to constantly monitor the crowd and look for potential problems. After action or post incident reviews should include input from these personnel on ways to improve safety and prevent heat related emergencies.

Recommendation six: The special event program manager should work with event coordinators and planners to explore the inclusion of water and electrolyte fluid vendors to advertise and provide courtesy drinks at a predetermined heat index level.

Recommendation seven: It is recommended that AFD personnel and leadership establish predetermined locations at large events to have cooling stations. These stations are recommended to have shade, water, and air flow from fans or misters that are easy to access.

Future readers of this paper should review their communities needs based on events and demographics. Climate, urbanization and geographic location of their communities may be considered.

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APPENDIX A

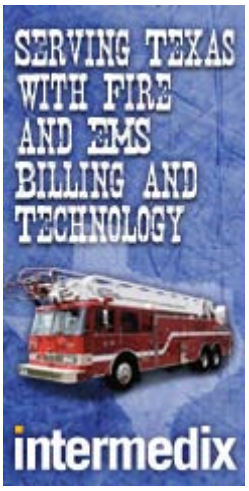
Texas Fire Chief's Association Questionnaire Request

From: Texas Fire Chiefs Association [mailto:newsletter@mail.naylorcampaign6.com]
Sent: Friday, June 29, 2012 11:29 AM
To: David Jones
Subject: The Friday Report - June 29, 2012

Mobile phone users can view an optimized version here.
If you cannot see this email properly, you can view this page in your browser.
You have received this newsletter because you are a member of TFCA. If you do not wish to receive future issues, you can be removed from list.

THE FRIDAY REPORT
THE VOICE OF LEADERSHIP OF THE TEXAS FIRE SERVICE

June 29, 2012 TexasFireChiefs.org | Archive | Online Buyers' Guide | Join TFCA | Printer-Friendly | Send to a colleague



ASSOCIATION NEWS

READ THIS: Important Article from Russell Sander, TFCA Safety Committee

PLEASE take a moment to read this important article written by Russell Sander, Chief of Missouri City Fire & Rescue Services and contributing member of the Safety and Health Committee. The article provides a brief summary of a Hyperthermia and Exertional Heatstroke incident and offers some considerations for all Texas fire departments during wildland operations. Thank you, Chief Sander, for this important submission!
Learn More...

TEXAS NEWS

TIFMAS Reimbursement - Have You Been Reimbursed?

If you have not been fully reimbursed for a previous TIFMAS deployment, would you please take a moment and send an email to Betty Wilkes at bwilkes@texasfirechiefs.org? We are attempting to collect information on past due reimbursements so that this piece of the TIFMAS reimbursement system can be more fully evaluated. Any information you can provide such as dates deployed, amount submitted and amount due, contact person to discuss the matter, etc. would be truly appreciated. Thank you for your cooperation as we try to work together to take care of Texas!

EFO Candidate Research - Please Respond to this Survey!

I am gathering information on community risk reduction for an EFO project at the NFA, specifically preventing heat related emergencies at special events or mass gatherings. Please take a minute or two of your time and help by completing this short survey. Thanks for your time! David Jones, Battalion Chief, Addison Fire Department, djones@addisontx.gov
http://www.surveymonkey.com/s/XDSNKBJ

TCFP Meetings - Mark Your Calendar

Please mark your calendar for the following meetings at the Texas Commission on Fire Protection. All meeting will take place in the William B. Travis Building and agenda items can be found by clicking here:

Commission meeting - July 11, 2012, 10:00 a.m. - Room 1-104

Wildland ad-hoc committee - July 31 - Aug. 1, 2012, 9:00 a.m. - HQ conference room

Fire Officer III & IV ad-hoc committee - Aug. 21-22, 2012, 10:00 a.m. - HQ conference room

Structure ad-hoc committee - Sept. 5-7, 2012, 9:00 a.m. – 5:00 p.m. - HQ conference room

Curriculum and testing committee - Sept. 19-21, 2012, 9:00 a.m. - HQ conference room

EMPLOYMENT NOTICES

Fire Fighter Examination - Greenville

The Firefighter's and Police Officer's Civil Service Commission of Greenville, Texas announces the examination for Entry Level FIRE FIGHTER positions with the Greenville Fire Department.
Learn More...

Fire Prevention Inspector - Travis County ESD 2

Pflugerville, Texas. Conducts site, building, and systems plan reviews to ensure compliance with the fire code adopted by the District; conducts technical inspections of buildings and properties to ensure compliance with the fire code adopted by the District; performs routine inspection and re-inspect work to ensure compliance with laws, ordinances, and regulations including the prevention and control of fires and the safe storage and handling of hazardous materials; assists with public education programs; and may conduct fire investigations as part of a fire unit investigation team. In the performance of duties communicates inside and outside the organization with a customer service focus and provides consultation and information regarding laws, rules, regulations and District policy related to fire safety and prevention while sharing knowledge and representing the District in a professional manner to customers, the public, government, and other external sources. Click here for full job description.

Firefighter, Temple

The City of Temple is accepting registration forms for the position of Firefighter. Excellent fringe benefits package. Progressive seniority pay increases; educational pay for college hours and certification pay following probationary period. Click here to view the full job description.

County Executive, Emergency Services, Austin

Reporting directly to the Travis County Commissioners Court, the County Executive for Emergency Services directs and administers County programs and services relating to the Office of Emergency Management, Emergency Medical Services, Fire Marshal's Office, Technology and Communications, Medical Examiner's Office, and general Emergency Services. Click here to view the full job description.

Fire Chief, Grand Prairie

The City of Grand Prairie is seeking a strong, innovative and progressive leader with a collaborative management style who will engage employees through teamwork and motivation, and promote diversity within the department. Click here to view the full job description.

Fire Fighter Wanted - Killeen

Position: Probationary Fire & Rescue Officer
Salary: $37,000.00/annually
Deadline: Sunday, July 8, 2012 at 11:59 p.m.

Applicants need not be certified to apply and test; however applicants who are certified by the Texas Commission on Fire Protection as a structural firefighter and licensed/certified Texas Department of State Health Services paramedic or certified emergency medical technician may be eligible to receive a preference in hiring, applicants meeting the certification requirements above with prior fire service in a municipal paid fire department, with any one entity, may be eligible for a hiring incentive and service credit for a higher salary.

For more information & to apply,
please visit our website at
www.killeentexas.gov
For more information call,
City of Killeen,
Human Resources Department @ 254-501-7831 begin_of_the_skype_highlighting
254-501-7831 end_of_the_skype_highlighting
EQUAL OPPORTUNITY EMPLOYER

CLASSIFIEDS

ISO Consulting - Don't Go Through a Survey Alone!

Most Fire Chiefs and their staff will undergo only one (at most two) ISO surveys during their entire career. Don't go through it alone! The ISO grading process is too tedious to master for this one career event. Enlist the assistance of expert Mike Pietsch, P.E., civil engineer, as you go through this process. Mike is the only vendor endorsed by the Texas Fire Chiefs Association. Mike has assisted more than 400 communities in Texas as a consultant and has performed more than 2,000 ISO ratings for communities as an ISO Field Representative and

technical reviewer.

Mike's expertise includes:
- Improving Communities' Public Protection Classification (PPC) Rating
- Fire Station Locations
- Alternative Water Supplies (Folda-Tank Water Suttles)
- Texas Addendum Evaluation

Mike Pietsch P.E. Consulting Services, Inc.
Phone: (972) 271-3292 begin_of_the_skype_highlighting (972) 271-3292 end_of_the_skype_highlighting
michaelpietsch@tx.rr.com
www.isospecialist.com

News From TEEX

Registration is now available for all Annual Schools! Register early for the discount! Fire Service Chief Executive Officer inaugural class, College Station. June 4-8, 2012. Register Today!
* Register now! June 12-13, 2012 - **Propane Industry Responders Conference**, Brayton Fire Training Field, College Station. Eligible for tuition reimbursement. Call 800-325-7427 begin_of_the_skype_highlighting 800-325-7427 end_of_the_skype_highlighting for information.
* NFA field courses offered statewide through the Extension program

* EMS Ambulance Strike Team Leader program: www.teex.org/ems
* NFA resident courses offered at NFA campus in Emmitsburg, Md.

* ESTI area school schedule (statewide - across Texas)

* ESTI EMS programs - CPR, Pre-Hospital Trauma Life Support, Adv. Cardiac Life Support, ECA, EMT, EMT-P, TxDOT Rural EMS, Refresher - CE & Instructor training: www.teex.org/ems

* Texas Fire Officer www.teex.org/leadership

For information on the more than 130 courses and programs that TEEX/ESTI offers, please check the TEEX/ESTI website at www.teex.org/fire or call 866-878-8900 begin_of_the_skype_highlighting 866-878-8900 end_of_the_skype_highlighting.

Texas Fire Chiefs Association
PO Box 66700, Austin, Texas 78766
Phone 1-800-435-9074 begin_of_the_skype_highlighting 1-800-435-9074 end_of_the_skype_highlighting or 512-454-6350 begin_of_the_skype_highlighting 512-454-6350 end_of_the_skype_highlighting
Fax 512-220-1521
Email bwilkes@texasfirechiefs.org -- Website www.texasfirechiefs.org

APPENDIX B

External Fire Department Questionnaire

Heat Related Emergencies at Special Events

1. Are there special events (mass gatherings) hosted within the community you serve? If no, you may stop here and I thank you for your time.

- ☐ Yes
- ☐ No

2. Where are special events in your community usually held?

- ☐ Indoors
- ☐ Outdoors
- ☐ Combination of both

3. What age group attends these events? (select all that apply)

- ☐ Children
- ☐ Teenagers
- ☐ Adults
- ☐ Senior citizens (>65 years old)

4. Are alcoholic beverages consumed at these events?

- ☐ Yes
- ☐ No

5. At you largest event, how many visitors may be in attendance?

- ☐ <1000
- ☐ 1000-25,000
- ☐ 25,000-50,000
- ☐ 50,000-75,000
- ☐ 75,000-100,000
- ☐ >100,000

6. Do you respond to heat related emergencies at any of these events?

- ☐ Yes
- ☐ No

7. About how many heat related emergencies are common at one event in your community?

- ☐ 1 or 2
- ☐ 3-5
- ☐ 6-10
- ☐ >10

8. What methods are used by your organization to prevent (not treat) heat related emergencies at special events?

- ☐ Bottled water (Free)
- ☐ Bottled water (Sold)
- ☐ Cooling Stations
- ☐ Large Cooling Fans
- ☐ Misters
- ☐ Other (please specify)

- ☐ Shade Structures/Tents
- ☐ Air Conditioning
- ☐ Pre-Event Media
- ☐ Public Announcement System
- ☐ None

9. Does your organization supply any special equipment or resources to the event site that contributes to preventing heat emergencies?

- ☐ Yes
- ☐ No
- ☐ Don't know

If yes, please specify 

10. Does your community have an ordinance that requires the presence of emergency personnel at the special event site during the event?

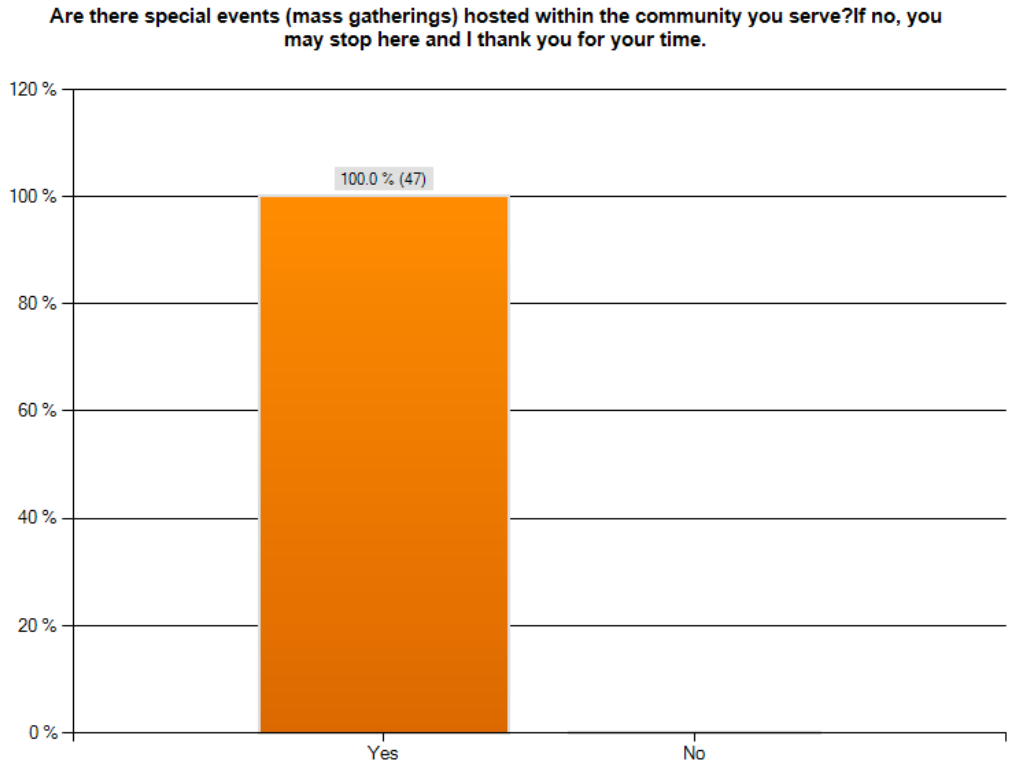
- ☐ Yes
- ☐ No
- ☐ Don't know

Done

APPENDIX C

External Fire Department Questionnaire: Analysis

1.



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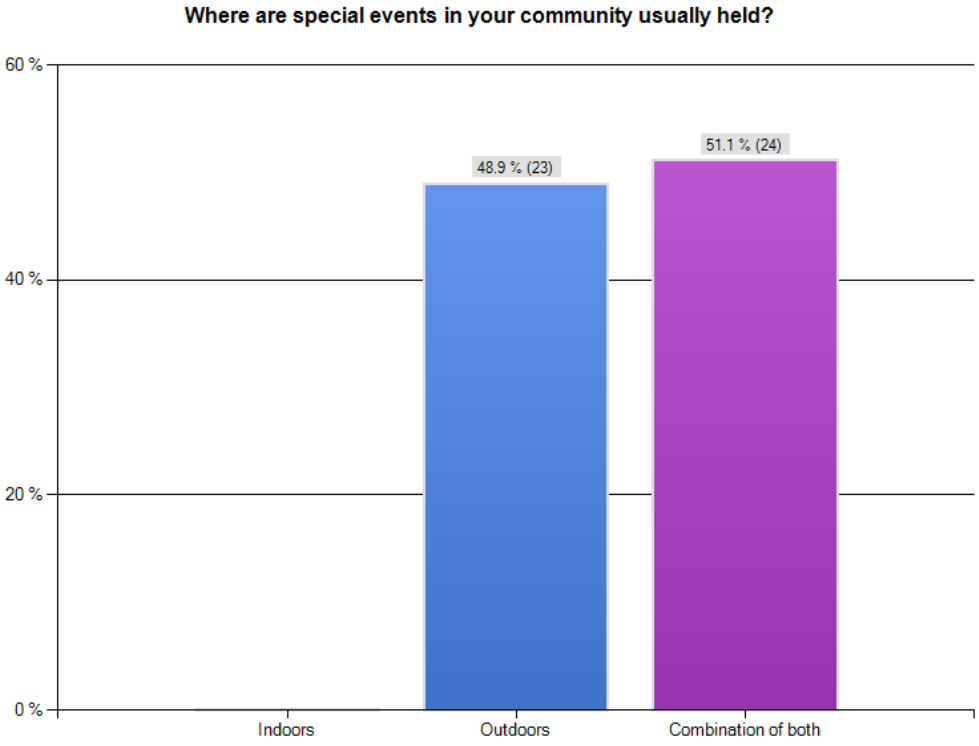

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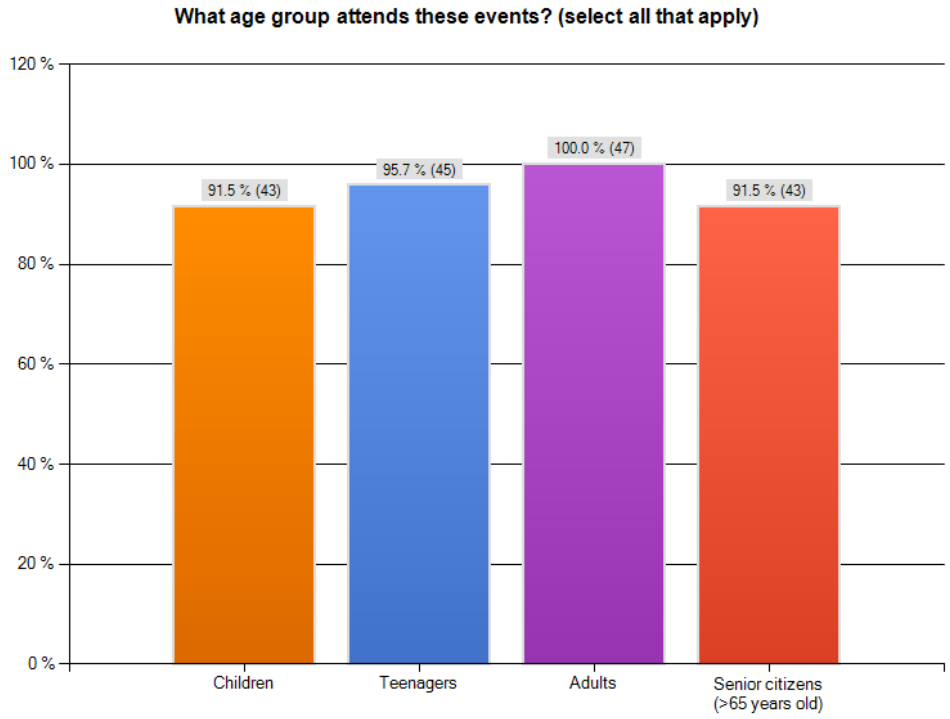
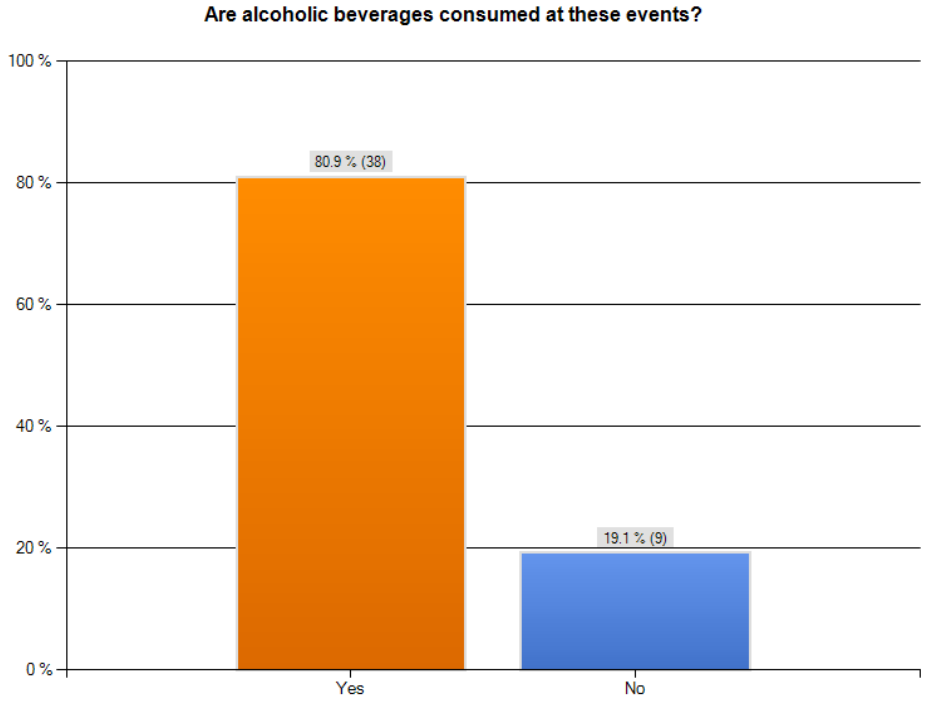
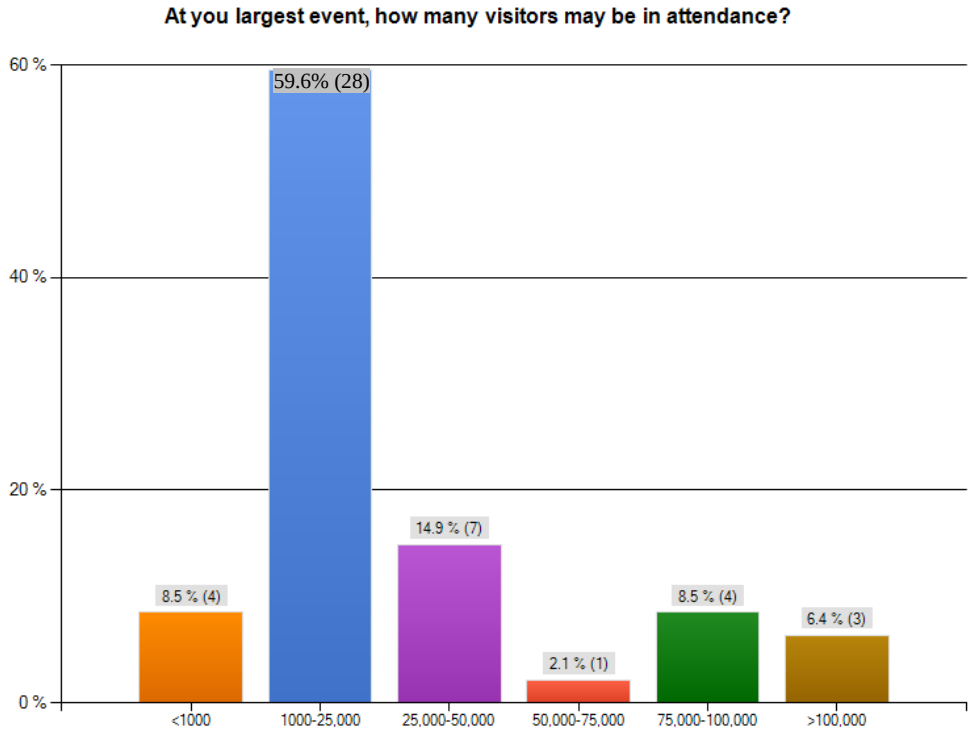

What age group attends these events? (select all that apply)
120 %
100 %
80 %
60 %
40 %
20 %
0 %
91.5 % (43)
95.7 % (45)
100.0 % (47)
91.5 % (43)
Children
Teenagers
Adults
Senior citizens (>65 years old)

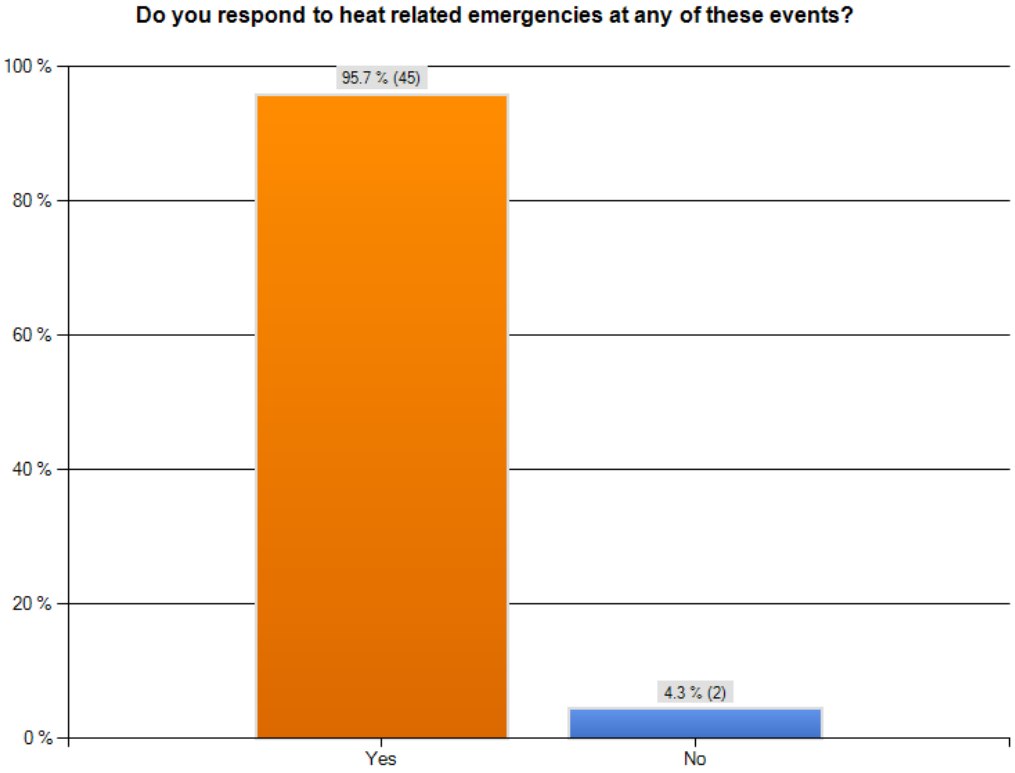
4.


Are alcoholic beverages consumed at these events?
100 %
80 %
60 %
40 %
20 %
0 %
80.9 % (38)
19.1 % (9)
Yes
No

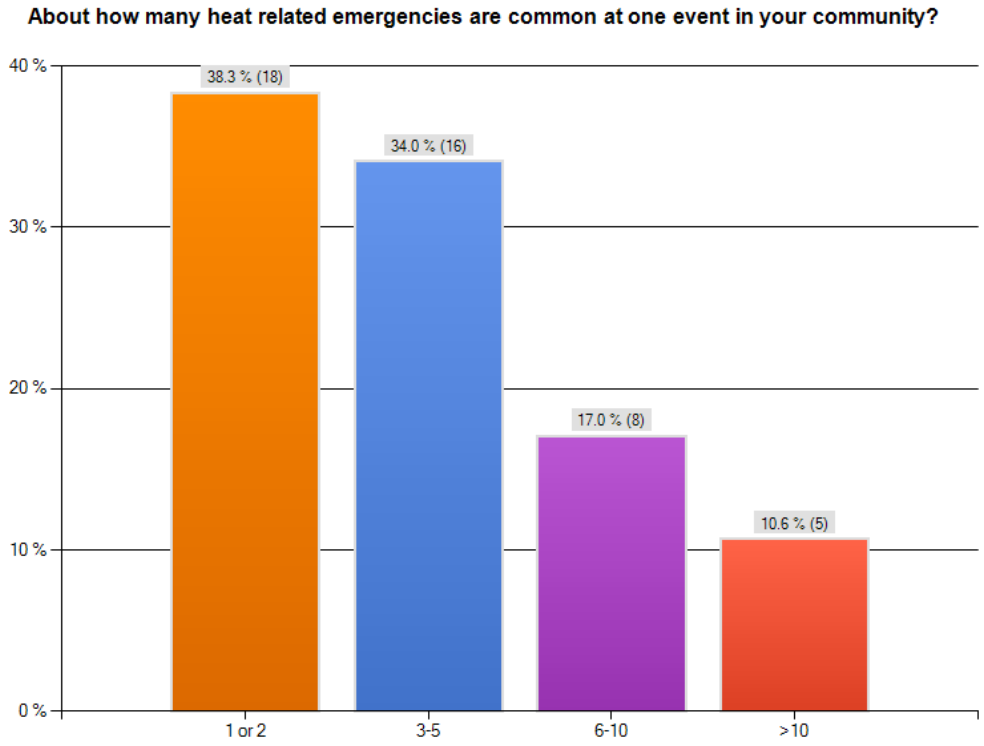
5.


At you largest event, how many visitors may be in attendance?
60 %
40 %
20 %
0 %
59.6% (28)
14.9 % (7)
8.5 % (4)
2.1 % (1)
8.5 % (4)
6.4 % (3)
<1000
1000-25,000
25,000-50,000
50,000-75,000
75,000-100,000
>100,000

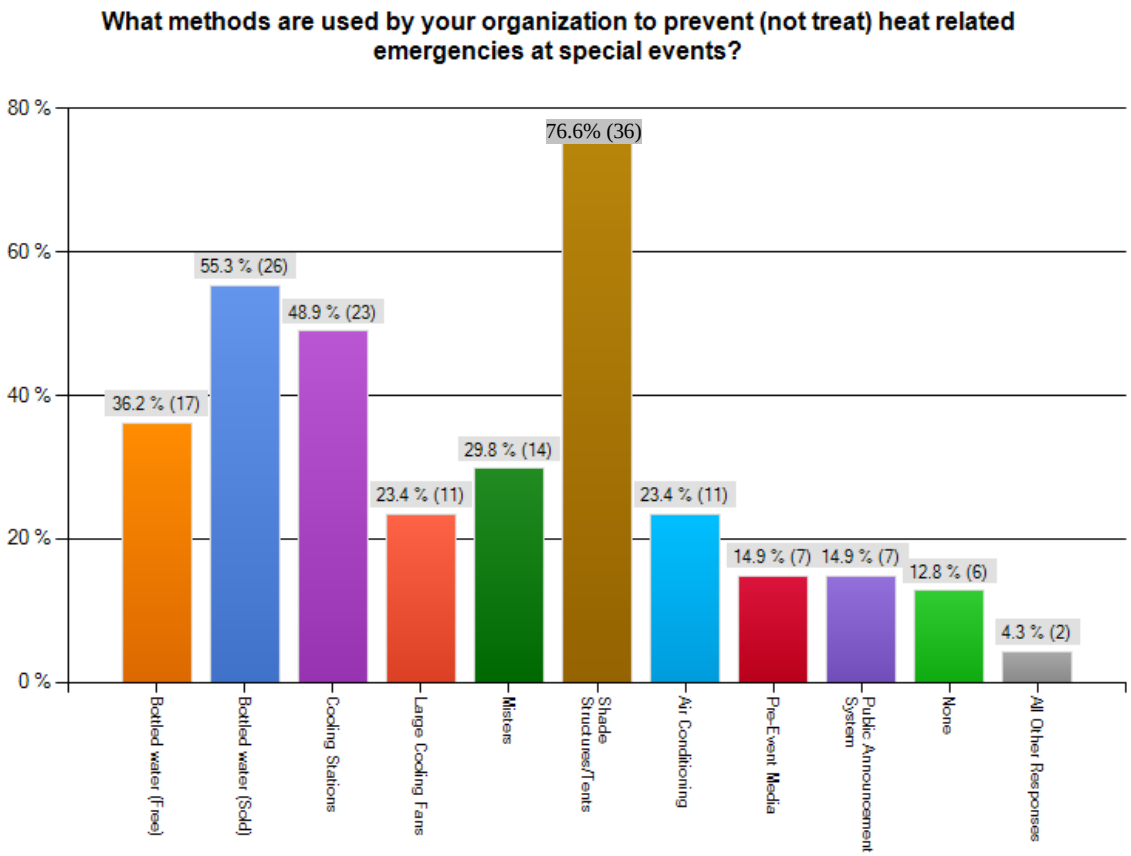
6.


Do you respond to heat related emergencies at any of these events?
100 %
80 %
60 %
40 %
20 %
0 %
95.7 % (45)
4.3 % (2)
Yes
No

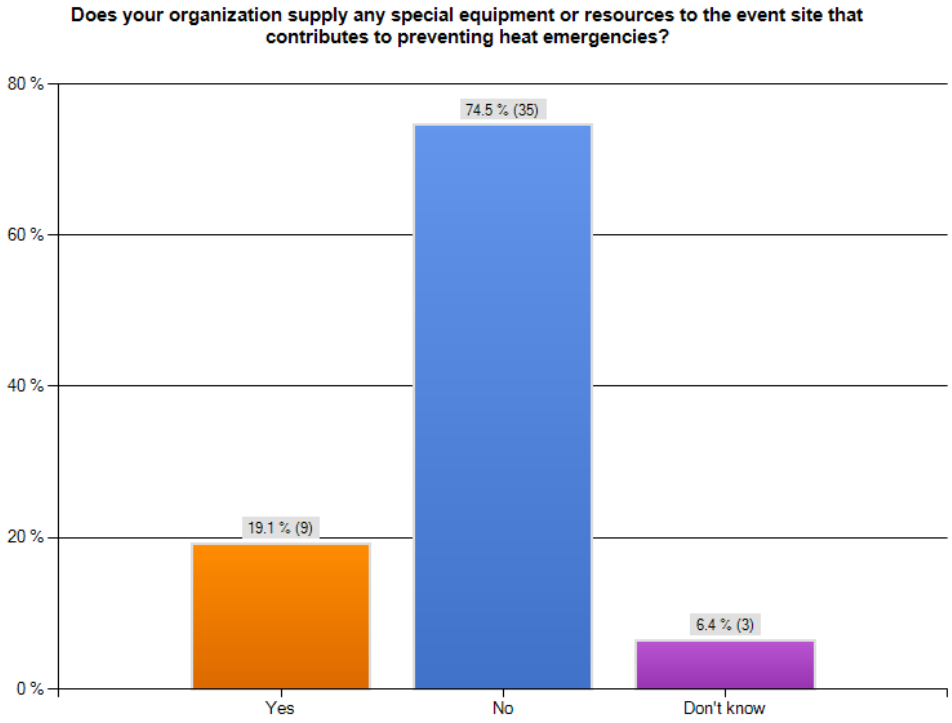
7.


About how many heat related emergencies are common at one event in your community?
40 %
30 %
20 %
10 %
0 %
38.3 % (18)
34.0 % (16)
17.0 % (8)
10.6 % (5)
1 or 2
3-5
6-10
>10

8.


What methods are used by your organization to prevent (not treat) heat related emergencies at special events?
80 %
60 %
40 %
20 %
0 %
36.2 % (17)
55.3 % (26)
48.9 % (23)
23.4 % (11)
29.8 % (14)
76.6% (36)
23.4 % (11)
14.9 % (7)
14.9 % (7)
12.8 % (6)
4.3 % (2)
Bottled water (Free)
Bottled water (Sold)
Cooling Stations
Large Cooling Fans
Misters
Shade Structures/Tents
Air Conditioning
Pre-Event Media
Public Announcement System
None
All Other Responses

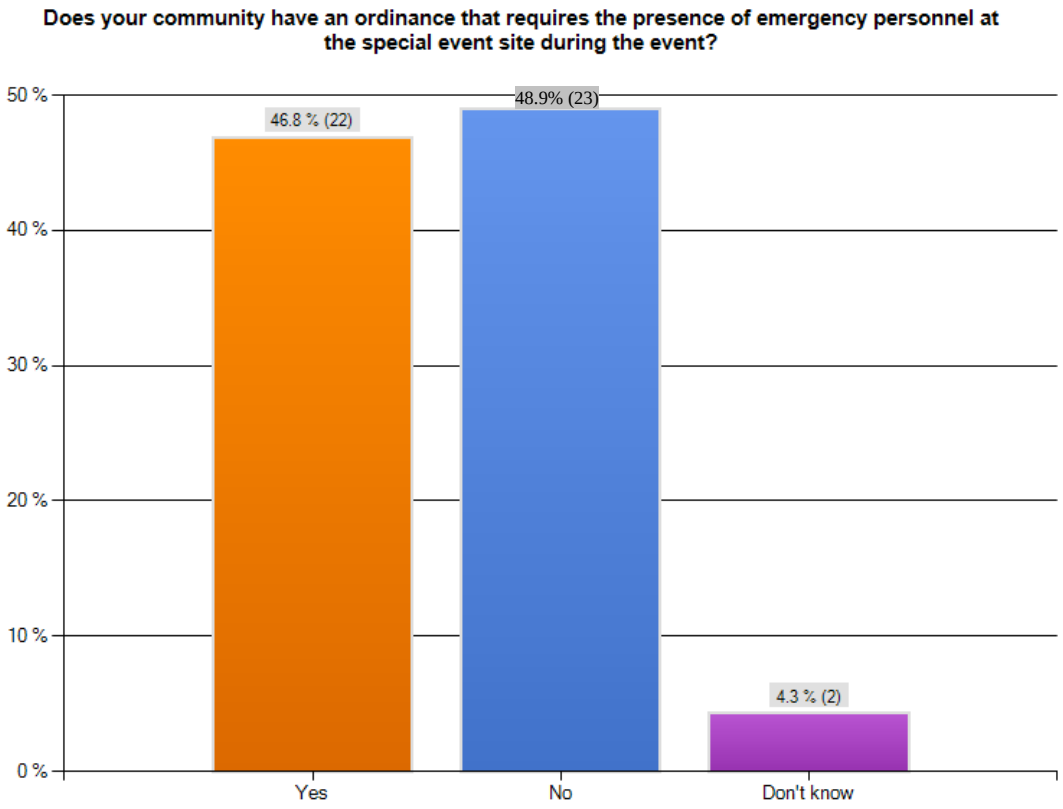
9.



"Yes" Answers were specified with the following nine responses:

- All tents are furnished by the city. Jul 9, 2012 2:31 PM
- Two medical details Jul 3, 2012 10:53 AM
- Zumro Decon Shelter with Air conditioning Water Ice Jun 29, 2012 12:32 PM
- Carts to move people around, sunscreen Jun 29, 2012 9:33 AM
- Strand-by Medics, Tents, Misters Jun 26, 2012 3:58 PM
- Special Rehab Unit Jun 25, 2012 12:07 PM
- Just water and Gatorade for employees, not for the public Jun 25, 2012 8:26 AM
- PFD provides shaded tents and a cooling station for prevention. We also provide an air conditioned trailer for treatment. Jun 25, 2012 5:42 AM
- Cooling Fans, Shade structures Jun 25, 2012 5:02 AM

10.


Does your community have an ordinance that requires the presence of emergency personnel at the special event site during the event?
50 %
40 %
30 %
20 %
10 %
0 %
46.8 % (22)
48.9% (23)
4.3 % (2)
Yes
No
Don't know

APPENDIX D

External Fire Department Interview Template and Transcripts

Interview Template:

Tami Kayea

Stuart McCutcheon

Stan Paynter

Mark Watson

NAME:

RANK:

ORGANIZATION:

YEARS:

BIO:

(2) What are other fire departments doing to prevent heat related emergencies at special events?

1. In your community, how would you define a special event?
2. What challenges or problems (if any) has your organization faced with heat related emergencies at special events?
3. Is your organization proactive or reactive in preventing heat related emergencies?
4. What are some methods your organization uses to prevent heat related emergencies?

Interview Transcripts:

Interview via telephone on July 10, 2012 at 3:05 pm:

NAME: Tami Kayea

RANK: Emergency Medical Services (EMS) Section Chief

ORGANIZATION: Dallas Fire Rescue, Texas

YEARS: 15

BIO: Employed with Dallas Fire Rescue since 1996; Chief Kayea has a Bachelor of Arts from Texas Women's University and a Masters in Management and Leadership form Tarleton State University. She is a licensed paramedic, Master Firefighter, Hazardous Materials Technician and a certified as a Fire Service Instructor II. She recently completed her first year at the National Fire Academy Executive Fire Officer Program.

(2) What are other fire departments doing to prevent heat related emergencies at special events?

1. In your community, how would you define a special event?
   Special events are already defined for our organization through our city; anything that requires a special event permit. As of February 2011, an ordinance was passed that requires any special event to utilize the Dallas Fire Rescue Department.

2. What challenges or problems (if any) has your organization faced with heat related emergencies at special events?
   One challenge was the Electric Daisy carnival in June 2011. This was a rave and it was one of the hottest days on record that year. It was 104-106 degrees. We did not anticipate number of heat related emergencies that we had. There were at least 30 transported and one fatality. We had to establish a Unified Command to handle this incident.

   Another was the Dallas Maverick's championship parade in May 2011. There were several heat emergencies that day as well. At the Rock and Roll half marathon in March of this year (2012), we almost cancelled the event after it started. We had close to four hundred patients the complained of heat related illness. We transported two but treated all the others. Also, the Cinco de Mayo celebration in Fair Park experienced several heat emergencies. It is a challenge to prepare for these emergencies and we work to plan for the worst.

3. Is your organization proactive or reactive in preventing heat related emergencies?
   Proactive

4. What are some methods your organization uses to prevent heat related emergencies?
   We applied for and received a 230,000 dollar grant through the Metropolitan Medical Response System. The grant provided for mass gathering equipment like tents with sidewalls, generators for air conditioners, porta-coolers or evaporation systems. We

recently purchased some rehab chairs with submersion arm rests for people to sit down and cool off.

We can provide the large cooler fans, pop-up tents, air conditioning and misters. We try to work with the venue to prevent heat related emergencies. If we can change the opening time, set up some shade or move things indoors when the heat is bad, it makes a difference. A very effective tool is to use the event promoters early on and provide education ahead of time to the people that will be attending.

Interview via telephone on July 11, 2012 at 10:00 am:

NAME: Stuart McCutcheon

RANK: Fire Chief

ORGANIZATION: Davenport Fire Department, Florida

YEARS: 7 total, 3 with DFD

BIO: Served in the United States Air Force from 1996-2000; Chief McCutcheon holds an Associate of Arts, Associate of Science, Bachelor of Science and is currently working towards his Master in Public Administration, a graduates certificate in emergency management Homeland Security and Executive Fire Officer certification.

(2) What are other fire departments doing to prevent heat related emergencies at special events?

1. In your community, how would you define a special event?
   Any planned event that places stress on existing resources

2. What challenges or problems (if any) has your organization faced with heat related emergencies at special events?
   Heat related events tend to become more of an issue during winter months when the temperature exceeds 80 degrees. We experience an annual influx of approximately 20% related to retirees. This group represents a significant number of event attendees, and as such, are our target hazard for heat related injuries. Education, indifference, and misinterpretation of warning signs appear to be a contributing factor to all groups. This is particularly exacerbated in the elderly population. During large city events, standard practice for emergency operations includes increasing staffing levels, standby rescue

units provided by the county, and notification to surrounding agencies of potential mutual/automatic aid requests.

3. Is your organization proactive or reactive in preventing heat related emergencies?

   Proactive

4. What are some methods your organization uses to prevent heat related emergencies?
   We are proactive in that we up staff in anticipation of increased call volume, coordinate mutual aid responses, provide air conditioned and shady areas near refreshment and food vendors, and provide a reminder on event programs.

Interview via telephone on July 23, 2012 at 12:00 pm:

NAME: Stan Paynter

RANK: Assistant Chief, Chief of Emergency Medical Services

ORGANIZATION: Reedy Creek Fire Department, Florida

YEARS: 27 total, 10 with Reedy Creek Fire Department

BIO: Chief Paynter began as a volunteer outside Kansas, Missouri. He eventually became a flight medic and worked in all aspects of emergency medical services in Tallahassee, Florida for 10 years. He has served the Reedy Creek Fire Department since 2003. Currently he is working to complete his Associates Degree.

(2) What are other fire departments doing to prevent heat related emergencies at special events?

1. In your community, how would you define a special event?
   Any large gathering that could exceed the capabilities in the immediate area to handle it. Disney World is in our immediate response area and defines our special events.

2. What challenges or problems (if any) has your organization faced with heat related emergencies at special events?
   We handle 25-30 medical calls a day in the summer months, estimating 85% of these are heat related events. When the temperature and humidity are up, our system can become taxed and mutual aid resources are called in. Every day is really a special event with between 120,000 and 500,000 on property daily.

3. Is your organization proactive or reactive in preventing heat related emergencies?
   Proactive

4. What are some methods your organization uses to prevent heat related emergencies?

   We meet several months in advance when we have a large event coming up. Probably the most effective method of prevention is providing literature and education to people. You would be surprised, but they do pay attention to it. There are announcements and reminders give out to educate the public. Disney World also monitors the park closely and can limit the number of people let in at the gate if needed. There are misting stations, mounted fans and portable fans used. Air conditioning is used as often as possible and encouraged. Our organization staffs for events and dedicates two medical units inside the theme park at all times. There are also nurse's stations and places for people to cool off. Education for the public and planning well ahead of special events helps.

APPENDIX E

Addison Fire Department Officer Questionnaire Request and Questionnaire

Request to Officers:

From: David Jones
Sent: Wednesday, July 11, 2012 3:01 PM
To: Fire Battalion Chiefs; Fire Captains; Fire Lieutenants
Subject: AFD Officer Questionnaire – Heat Related Emergencies at Special Events

Officers,

Please help me out by completing this brief questionnaire on heat related emergencies at special events. This is for an applied research project for the EFO program at the NFA.

It will only take a moment and will be closed on July 24th.

Thanks for your assistance,

David Jones

Subject: AFD Officer Questionnaire – Heat Related Emergencies at Special Events

http://www.surveymonkey.com/s/7Z9WPDJ

Questionnaire:

AFD Officer Questionnaire

Heat Related Emergencies at Special Events

1. During your career at the AFD, about how many special events have you worked at the event site?

- ☐ 1-5
- ☐ 6-10
- ☐ 10-15
- ☐ >15

2. How many patients are treated for heat related issues at special events (including no transports)?

- ☐ 1-5
- ☐ 5-10
- ☐ >10

3. Is there potential for AFD resources to be overwhelmed by patients at special events?

- ☐ Yes
- ☐ No

4. Could the AFD improve the equipment or resources at the event site to reduce the number of heat related emergencies?

- ☐ Yes
- ☐ No

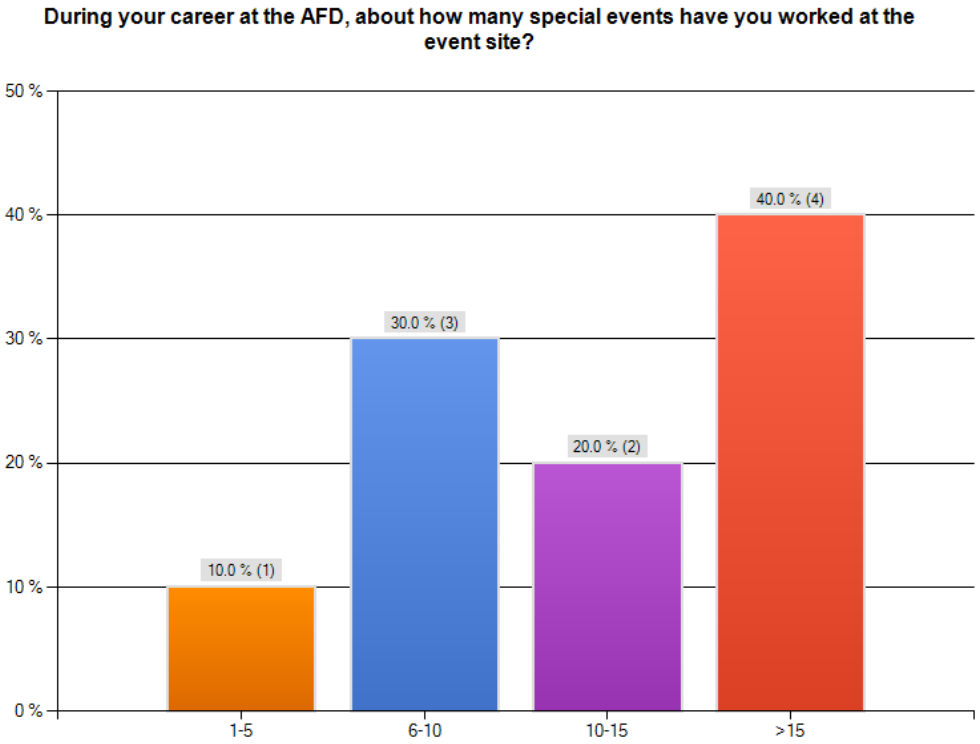
5. What actions could be taken by the AFD to reduce the number of heat related emergencies at special events?

Done

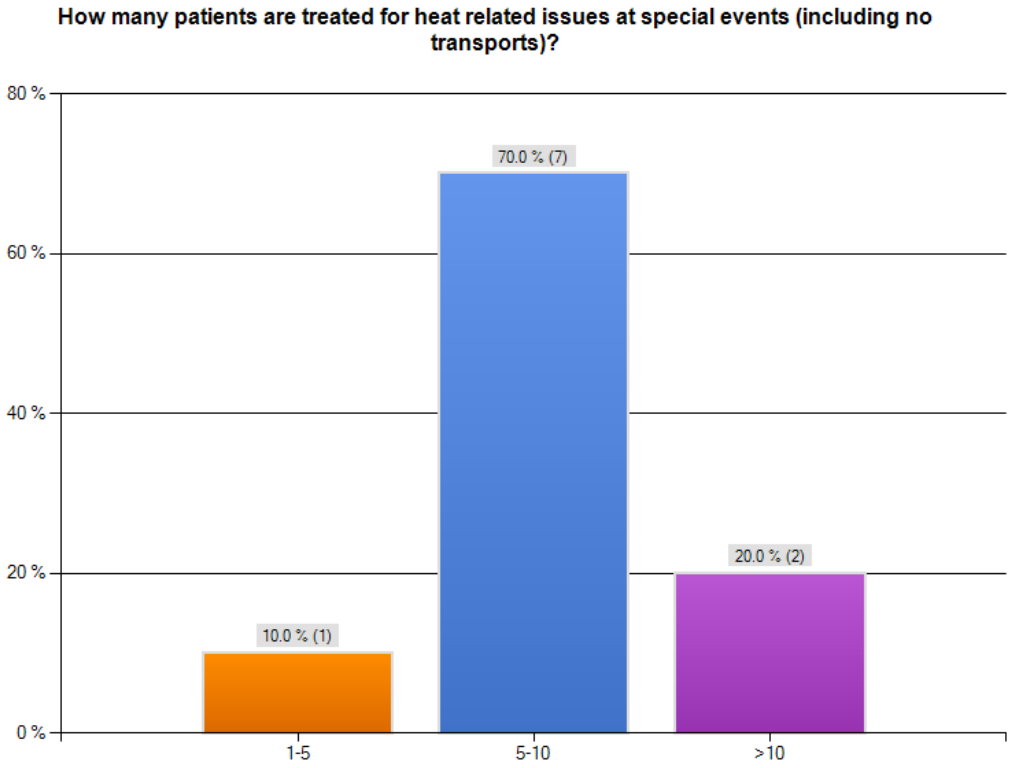
APPENDIX F

Addison Fire Department Officer Questionnaire: Analysis

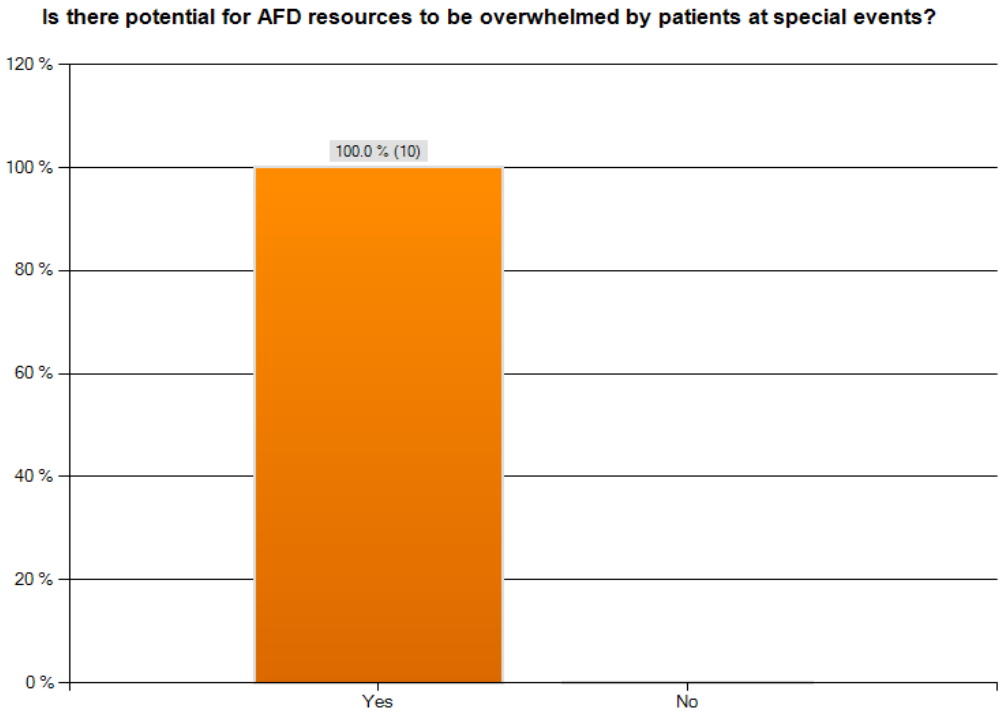
1.



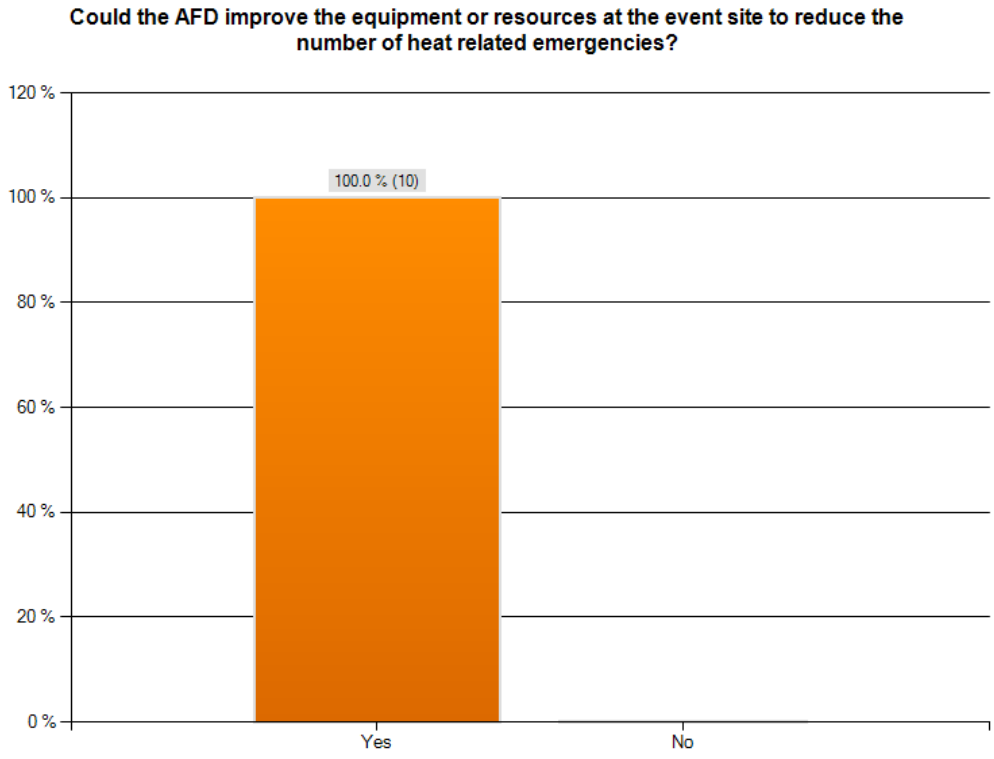
2.



3.


Is there potential for AFD resources to be overwhelmed by patients at special events?
120 %
100 %
80 %
60 %
40 %
20 %
0 %
100.0 % (10)
Yes
No

4.


Could the AFD improve the equipment or resources at the event site to reduce the number of heat related emergencies?
120 %
100 %
80 %
60 %
40 %
20 %
0 %
100.0 % (10)
Yes
No

5. **What actions could be taken by the AFD to reduce the number of heat related emergencies at special events? (10 Responses)**

- Have cooling stations setup during the hot events. Advise people as they enter to drink water. Jul 13, 2012 7:37 AM

- Give out water, provide more air conditioning, educate the people attending to limit their alcohol consumption, provide misters or fans, hand out fans Jul 12, 2012 2:23 PM

- Utilizing large misting fans throughout the event site. Also, having a larger area to get patients out of the heat other than the small storefront currently in use. Jul 12, 2012 2:21 PM

- Cooling stations and enclosed special ops apparatus. Jul 12, 2012 10:50 AM

- We could take the Cool Misters off of U101 to use but that would mean that we wouldn't have them available for our own use. We should be able to justify the purchase of additional misters for SE needs. Keeping a Medic on scene with the back A/C on helps to provide a cool environment for pts. to treated in. If there are several pts. at once we have a limited area that is shaded that we can use. If possible, we might get permission to use the Conference Center as an emergency treatment area. We could even purchase folding cots and electric fans and have them stored somewhere inside the CC to deploy as needed. They have an ice machine there that might come in handy. I know that they like to limit access to the CC so additional APD could be needed to assist with that operation. As far as reducing the number of heat related emergencies, it has been my experience that a lot of people that come to our SE are not acclimated to the heat and many times they also are impaired. We can add the large misters that we use at SE but it still doesn't prevent all heat related emergencies. It's Texas, it's going to be hot at most of our events. Jul 12, 2012 6:52 AM

- Posting information about heat stress on the town website that gives details about the event. Post the same info at the gates to the event. Provide "cool down areas". Jul 12, 2012 6:43 AM

- Provide cool stations with mister fans and such. The FD needs more equipment and another EV vehicle to respond to ALL the people we encounter. Jul 11, 2012 6:31 PM

- Perhaps a "Cooling and Hydration" center for park guest. I'm talking fans with water mist attachments. Perhaps have a bottled water company setup mobile watering stations to encourage hydration. I have seen this at Mayfest in Ft. Worth and the State Fair. Jul 11, 2012 4:10 PM

- Increase personnel, supplies and equipment to handle a possible overwhelming situation. Jul 11, 2012 3:11 PM

- Providing "cooling centers" and basic medical screening Jul 11, 2012 1:06 PM

APPENDIX G

Addison Fire Department Chief Officer Interview Template and Transcripts

Interview Template:

John O'Neal

Chris Kellen

NAME:

RANK:

ORGANIZATION:

YEARS:

BIO:

(4) What can be done to reduce the risk of heat related emergencies at Town of Addison Special Events?

5. What problems or challenges have been encountered by the Fire Department regarding heat related emergencies during special events in Addison?
6. Are there any improvements or proactive changes that could be made in our involvement with the special events in the area of prevention?
7. What could the AFD do to reduce the number of heat related emergencies at the Town of Addison Special Events?

Interview Transcripts:

Interview held at Addison Fire Station #1, 4798 Airport Pkwy, Addison, TX 75001 on July 12, 2012; 8:50am

NAME: John O'Neal

RANK: Fire Chief

ORGANIZATION: Addison Fire Department

YEARS: 32

BIO: Chief John O'Neal took position as the Town's Fire Chief on May 2, 2011. John, a native of Portsmouth, VA spent 16 years with the City of Portsmouth Fire, Rescue and Emergency Services beginning as an Auxiliary Firefighter in 1979 and rising to Battalion Chief when he retired in 2001. John later worked for the City of Jacksonville, NC as Deputy Fire Chief, and most recently spent six years as the Fire Chief for the City of Manassas Park, VA.

Chief John O'Neal earned undergraduate degrees from Tidewater Community College and the University of Maryland University College. His Masters of Public Administration Degree was awarded by Troy State University. He is a graduate of the National Fire Academy's Executive Fire Officer Program and holds the Chief Fire Officer designation. Since 2004, he has served as a peer assessor for the Commission on Fire Accreditation International.

(4) What can be done to reduce the risk of heat related emergencies at Town of Addison Special Events?

1. What problems or challenges have been encountered by the Fire Department regarding heat related emergencies during special events in Addison?
   The potential exists and is real

2. Are there any improvements or proactive changes that could be made in our involvement with the special events in the area of prevention?
   We can be more proactive with educating and messaging the public prior to and during the events. We should explore grants to purchase misting stations etc. We should explore sponsorships to fund water or misters for patrons.

3. What could the AFD do to reduce the number of heat related emergencies at the Town of Addison Special Events?
   The department could improve its communication to work closely with event sponsors, organizers and staff to be proactive in planning. Build in contingency plans and be prepared. Coordinated training for the events ahead of time would help to prevent problems later. Specifically, educating the public through various means available could help us reduce heat emergencies.

Interview held at Addison Fire Station #1, 4798 Airport Pkwy., Addison, TX 75001 on July 12, 2012 at 8:15am

NAME: Chris W. Kellen

RANK: Deputy Chief of Training/EMS

ORGANIZATION: Addison Fire Department

YEARS: 33

BIO: Chris Kellen joined the Addison Fire Department as a Firefighter/Paramedic in February 1994. He served as a Field Training Officer for paramedics, was promoted to Lieutenant in August 2000, Captain in January 2001, Division Chief in March 2003 and currently serves as Deputy Chief of the EMS and Training Division. Chief Kellen oversees administration of all fire and emergency medical service training programs, new-hire and promotional processes and the Town CPR program. He is also a member of the Safety Review Board.

Prior to coming to Addison, Chief Kellen served as Paramedic/Supervisor for Montgomery County Emergency Medical Services. He was also a Firefighter/Paramedic for the City of Houston and the City of College Station, Texas.

Chris received a Bachelor of Arts degree in Communications from Texas A&M University. He is certified by the Texas Department of State Health Services as a Licensed Paramedic. He holds certifications with the Texas Commission on Fire Protection as an Instructor III, Master Aircraft Rescue Firefighter, Master Firefighter, Field Examiner and Fire Officer I. He is currently enrolled in the National Fire Academy's Executive Fire Officer Program. Chris is also a member of the Addison Midday Rotary Club.

(4) What can be done to reduce the risk of heat related emergencies at Town of Addison Special Events?

1. What problems or challenges have been encountered by the Fire Department regarding heat related emergencies during special events in Addison?
   Mainly the amount of resources we have available on site. We are limited with personnel at the event site. Our staff treats patients and crews become tied up during patient care, especially difficult when there are multiple patients. At times we have to call engines to respond to the site to help back up crews with patients. Manpower can become a problem, for example, we had an Oktoberfest in 2005 or 2006 in which there were 80-90

cases of asthma being treated. We did not have enough staff or Albuterol on site and had to call in resources. Heat related emergencies are something we could work to prevent.

2. Are there any improvements or proactive changes that could be made in our involvement with the special events in the area of prevention?
   We could communicate more effectively with patrons, be prepared for these things. We could acquire cooling stations with fans. We should be proactive and educate.

3. What could the AFD do to reduce the number of heat related emergencies at the Town of Addison Special Events?
   Number one is education and being proactive. The fire department should be in the loop with the coordination and planning prior to the event. Providing cooling stations would help and creating larger air conditioned treatment areas for people to come cool off. Currently we use the back of an ambulance and a small police substation that has air conditioning. It would help if we provided misting stations and created maps to hand out to all patrons with the misting station locations and cooling stations. Additionally, we should try to increase the number of water fountains at the site or available water. Water is sold on site but not always available to the general public for free. Finally, during Kaboom Town, we should make the conference center available to the general population. It is often used for VIP guests only.