Active Shooter Events in the Workplace:
Findings and Policy Implications

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Abstract

Employees and citizens generally view places of business as inherently safe. Business leaders sometimes make hasty security decisions in hopes of protecting their employees and customers. Leadership should have empirical data to aid in the decision making process. The current report provides an exhaustive breakdown of active shooter events in the workplace. These data are disaggregated by the function of the business (e.g., retail, factory/warehouse, and office space) and include information on the shooter, the event itself, and how the event is resolved. These analyses are followed up by an in-depth discussion of potential policy changes that the data support.

INTRODUCTION

On September 16, 2013, a lone gunman fatally shot twelve people and injured three others in a planned attack at the offices for the Naval Sea Systems Command inside the Washington Navy Yard in Washington, D.C. The shooter gained access to the building with a valid contractor ID badge. He had both a handgun and a disassembled shotgun hidden in a backpack. He assembled the shotgun in a restroom before beginning his attack. Over the course of an hour, the shooter attacked multiple floors before he was eventually stopped in a shootout with responding police officers (Campbell, 2013). This event illustrates a subset of active shooter events—attacks that occur at places of business.

This paper investigates active shooter events (ASEs) that happen at business related locations. In doing so, this paper seeks to provide business owners, employees, community officials, and law enforcement officers with accurate empirical data regarding such events. It is our hope that this research will not only help ground policies and procedures in real world data but also help mitigate the damage caused by future attacks.

LITERATURE REVIEW

Overview of Workplace Violence

Frequency. Active shooter events are an extreme example of workplace violence. While the literature on active shooter events is sparse, the concept of workplace violence is well established. There are an estimated 2 million cases of workplace violence each year in the United States (OSHA, 2002). Though workplace violence can take many forms, it is generally separated into two primary forms: physical or psychological aggression (Hershcovis, Turner, Barling,

Arnold, Dupré, Inness, LeBlanc, & Sivanathan, 2007; Folger & Baron, 1996). While examples of physical aggression are fairly easy to identify as they contain overt actions intended to hurt individuals (e.g., assaults), psychological aggression can be much more difficult to identify. The two most common examples of psychological aggression are bullying and verbal threats. Additionally, many researchers have reported that psychological aggression is much more common than physical aggression (Baron and Neuman, 1996; Baron and Neuman, 1998; Seger, 1993). In most forms of workplace violence, the aggressor performs actions that are harmful to victims while incurring the least amount of risk for themselves (Bjorkqvistt, Osterman, & Hjelt-Back, 1994). This is in contrast to active shooter events, where it appears the attacker often intends to die during the course of the attack. Because ASEs fall under the category of physical aggression/violence, this review will focus on this area.

Rugala and Isaacs (2003) discuss the frequency of different types of physical workplace violence. Utilizing National Crime Victimization Survey (NCVS) and Bureau of Labor Statistics Census of Fatal Occupational Injuries data from 1993 to 1999, the authors found that simple assault was the most common form of workplace violence, accounting for more than 75% of all workplace violence events (n = 1,311,700). An example of simple assault would be one individual shoving another individual. Aggravated assault (e.g., presence of a weapon or severe injuries) accounted for 18.6% of the victimizations. Robbery (4%; n = 70,100) and rape/sexual assault (2.1%; n = 36,500) together accounted for 6.1% of workplace victimizations. Fatal workplace violence events (homicides) were rare, accounting for only 0.1% of workplace violence events (n = 900). In 79% of the incidents of workplace violence, the target does not suffer actual physical injury.

It should be noted that these data likely underrepresent the actual number of physical workplace violence events (Barling, 1996; Lion, Snyder, & Merrill, 1981). While the homicide data are most likely accurate, both Barling and Lion et al. assert the data for less serious types of workplace violence are underrepresented. In fact, both Barling and Lion et al. have concluded that five incidents of violence occur in the workplace for every one that is reported.

Predictors. Researchers have also attempted to identify predictors of workplace violence. Several scholars have examined potential causes of workplace violence and aggression (Barling, 1996; Baron & Neuman, 1996; Braverman, 1999; LeBlanc & Kelloway, 2002). For instance, utilizing self-report data, Baron and Neuman (1996) found that changes within the structure of the workplace affected the frequency of aggression. Specifically, pay cuts, an influx of part-time employees, management changes, increased diversity, performance monitoring, and budget cuts were all significantly related to an increase in workplace aggression. LeBlanc and Kelloway (2002) established risky workplace attributes that were correlated with incidents of violence. These attributes included, but were not limited to, the physical care of others, denying a service, disciplining others in the workplace, and making decisions that affect other people's lives.

Consequences. Workplace violence has a dramatic impact on its direct victims, their families, society, and the economy. The FBI estimated in 2011 that non-fatal workplace violence cost businesses approximately $36 billion per year (Romano, Levi-Minzi, Rugala, & Van Hasselt, 2011). In addition to delineating the large financial costs of violent events, the literature also examines physical and organizational consequences of workplace violence. LeBlanc and Kelloway (2002) found workplace aggression and violence initiated by co-workers negatively affected emotional well-being, psychosomatic well-being (i.e., physical health), and effective commitment. Aggression and violence initiated by members of the public increased the

perception of likely future violence. Increased fear of violence also predicted employee turnover (LeBlanc & Kelloway, 2002; Rogers & Kelloway, 1997). Additional research has found workplace violence is associated with a decrease in productivity (Barling, Rogers, & Kelloway, 2001) and job satisfaction (Budd, Arvey, & Lawless, 1996).

Other research has examined how the negative impacts of workplace violence and aggression can be mitigated. Schat and Kelloway (2003) examined whether instrumental or informational support would reduce the negative outcomes of workplace violence and aggression. Instrumental support is given by co-workers or peers following an act of workplace violence; while informational support is training provided by the place of business regarding what procedures or actions to take following an act of workplace violence. The authors found that support from co-workers and providing training on how to deal with being a victim of workplace violence can help mitigate the negative outcomes of the violence and improve individual and organizational performance. We now discuss a specific type of extreme workplace violence, active shooter events (ASEs).

Active Shooter Events

The federal definition of an active shooter event is "an individual actively engaged in killing or attempting to kill people in a confined and populated area" (Blair & Schweit, 2014, p. 5). It is important to note that active shooter events are *not* synonymous with mass murder or mass shooting. Mass murders or shootings generally require that a minimum number of people be shot or killed (usually three or four) (Fox & DeLateur, 2014; Investigative Assistant for Violent Crimes Act of 2012). Active shooter events do not have this requirement. It is often useful to think of them as *attempted mass murders*. In some instances, many people are injured.

In others, few or even none are injured. We believe that it is important to study both high and low casualty events because lessons can be learned from both.

Despite recent media attention on active shooter events, there has been relatively little systematic research on these events. Much of what exists consists of case studies or collections of events without an explanation regarding how the collections were developed (see for example: Giduck, 2011; Leary, Kowalski, Smith, & Phillips, 2003; Smith & Supiano, 2008). However, there have been a few notable exceptions (e.g., Blair, Nichols, Burns, & Curnutt, 2013; Blair, Martaindale, & Nichols, 2014, Blair & Schweit, 2014; NYPD, 2012).

The most comprehensive study of recent active shooters to date was reported by Blair and Schweit (2014). This report utilized systematic Internet searches and FBI data sources to identify 160 active shooter events that occurred between 2000 and 2013. Blair and Schweit found that the frequency of these events appeared to be increasing and that at least 1,043 people had been injured in active shooter attacks during the timeframe of the study.

Active Shooter Events and Businesses

Very little research has focused on active shooter events in business locations. While Blair and Schweit (2014) reported the most complete analysis of recent active shooter events to date, the data on businesses (called commerce locations in the report) were generally grouped together with data from schools, outdoor attacks, and other locations. The report did provide a small section giving some details specific to business attacks. The authors divided commercial locations into three categories—businesses open to pedestrian traffic (n = 44), businesses closed to pedestrian traffic (n = 23), and malls (n = 6). Key findings included the majority (n = 30; 68%) of businesses open to pedestrian traffic were attacked by individuals not employed by the businesses and 96% of businesses closed to pedestrians (22 of 23) were attacked by employees

or prior employees. The authors also specified how the events concluded for the three types of commercial locations (e.g., suicide, apprehension, fleeing, law enforcement shooting suspect).

Beyond the Blair and Schweit (2014) report, there are only anecdotal accounts of active shooter attacks at business locations. For example, Finklestein (2015) utilized the aggregate findings from Blair and Schweit (2014) to discuss potential physical security best practices. Finklestein used concepts of crime prevention through environmental design (CPTED) such as facility hardening, access control, and architectural design to suggest approaches to preventing ASEs. While both aggregate data and anecdotal accounts yield important information, neither provides the detail necessary for informed policy development. Furthermore, the literature on workplace violence does little to address the evolving threat of an active shooter. The focus has been on more common types of threats and aggression. We believe it is important to provide businesses with data to bolster the discussion regarding active shooter policy. Currently, this information is lacking. This paper seeks to fill this void in the literature.

METHODOLOGY

The list of active shooter events is derived from the list provided by Blair and Schweit (2014). In their data set, 73 active shooter events from 2000-2013 were coded as occurring in places of commerce. These cases were divided into three categories: 1) business open to pedestrians such as retail stores; 2) businesses closed to pedestrians such as offices or factories; and 3) malls. For the purposes of this paper, the definition of businesses was expanded to include healthcare facilities and certain government buildings that function as business locations (e.g., museums or office buildings housed on federal property). Military bases were not included in this analysis. The additional cases increased the total number of business events to 83.

While it is possible that Blair and Schweit (2014) were unable to identify every active shooter event during the research period, we consider it the most complete list in existence. This list was cross-checked against others (such as the NYPD 2012 report on active shooters and Lieberman, 2008) and in no case did we find that the Blair and Schweit collection was missing an event. However, additional cases matching the definition of an active shooter event were identified in the Blair and Schweit data.

Data

The current paper utilized the 83 business active shooter events identified by Blair and Schweit (2014). The manner in which the variables were coded, as well as definitions of variables, is included below.

Coding. Sixteen variables were coded for inclusion in this study via three different sources of data. These were reports from the investigating agency or agencies, the Supplemental Homicide Reports (SHR) produced by the FBI, and news stories. It should be noted that not all sources of data were available for all events. The most current data in the SHR only cover up to 2012, therefore it was not possible to utilize the SHR for events that occurred in 2013. Furthermore, SHR data are not available for the state of Florida. Recent events are generally under ongoing investigations and the investigating agencies do not release these reports. Therefore, events that occurred in the last years of the data set were, generally, coded from the most recent news reports.

A primary coder completed the coding process for all 83 events identified. A second coder independently coded 20% of the cases to ensure reliability (n = 7). Agreement between the coders was 99%.

Variables. Sixteen variables were coded for inclusion. The agreement between coders will also be presented for each variable.

Age – "Age" identifies the age of each shooter in years. Agreement = 100%.

Sex – "Sex" is a dichotomous variable identifying the shooter as male or female. Agreement = 100%.

Race – "Race" identifies the racial makeup of the shooter, if known. "Race" is coded as African American, Caucasian, Hispanic, Asian, Other, or Unknown. Agreement = 100%.

Shooters – "Shooters" identifies the number of shooters for each incident. Agreement = 100%.

Relationship – "Relationship" identifies the manner in which the shooter is connected to the attack location. Coded as Employee, Former Employee, or No Relationship. A relationship means that the shooter had a connection to that business, which could include current employees/coworkers, those who were fired that day, those who had been previously fired, or resigned/retired employees. "Relationship" can also reflect secondary relationships. These are coded as Personal Secondary or Professional Secondary. In this type of relationship, the attacker personally or professionally knew an employee, but was not an employee him or herself. A personal secondary relationship occurs when a shooter attacks the workplace of any acquaintance (e.g., significant other, friend). Professional secondary relationships occur when a shooter attacks a location where they are clients. Agreement = 100%.

Shot – "Shot" accounts for the total number of victims shot during the incident. "Shot" encompasses all victims that either survived or succumbed to their wounds. This does not include the shooter if he/she was wounded or killed. Agreement = 88%.

Killed – "Killed" identifies the total number of victims that were killed for each incident and was extracted from the "Shot" variable. Agreement = 100%.

Wounded – "Wounded" identifies the total number of victims wounded from gunfire and was extracted from the "Shot" variable. Agreement = 88%.

Location – "Location" refers to the type of business attacked. Coded as Factory/Warehouse, Office, or Retail. Agreement = 100%.

Resolution – "Resolution" captures the manner in which the event is resolved. "Resolution" is coded as Subdued by Citizens, Suicide before Law Enforcement Arrival, Flee, Subdued by LE, Shot by LE, Suicide after LE Arrival, or Surrendered. Agreement = 100%.

Resolved Pre – "Resolved Pre" is a dichotomous variable denoting whether or not the event was resolved before law enforcement arrival. Agreement = 100%.

Mobility – "Mobility" identifies whether the shooter left one location and continued to attack a separate location. Agreement = 100%.

Weapon – "Weapon" is utilized to identify the deadliest weapon used in the incident. "Weapon" is an ordinal variable coded as increasing in lethality as Pistol, Shotgun, or Rifle. Agreement = 100%. If there were more than a single weapon, the weapon with the highest level of lethality was chosen.

Multiple weapons – "Multiple weapons" is a dichotomous variable identifying the presence of more than one weapon in the possession of the shooter. Agreement = 100%.

Explosive – "Explosive" is a dichotomous variable identifying the presence of an explosive device at the scene of the active shooter event. Agreement = 100%.

Hour – "Hour" represents the time of day an active shooter event is reported to the authorities. Agreement = 100%.

RESULTS

These 83 events can be viewed as a whole or disaggregated into three major categories, factories and warehouses (n = 22, 27%), offices (n = 25, 30%), and retail (n = 36, 43%). The following results show aggregated (all business locations) and disaggregated (factory/warehouse, offices, or retail) findings where appropriate. It is important to note, that we consider these data to be population level data. That is, they consist of all known business-based active shooter attacks that occurred between 2000 and 2013 that were located by Blair and Schweit (2014). Because of this, statistical significance tests (other than tests of the normality of distributions) are not reported. The data are the population, so that there is no need to infer from a sample. Some may argue that the Blair and Schweit (2014) methodology was not perfect, and therefore some cases have undoubtedly been missed. Thus, the data are not a true population. Even if this is the case (which it probably is), the data that are missing are unlikely to be missing at random. In addition, systematic factors (such as the amount of media coverage) are likely to be at play; therefore, significance testing would still be unjustified.

Figure 1 illustrates the frequency of active shooter events per year. A power function provided the best fit to the data ($y = 1.0784x^{0.7814}$, $R^2 = .53$). While it may appear that business active shooter events are increasing, the power function's exponential value of less than one suggests that the trend has reached a plateau. Additionally, caution should be taken when interpreting relatively short-term trends especially when the events in question are infrequent. Because the search strategy primarily utilized newspaper archive services to locate events, it is possible that more recent years were better archived than earlier years. This could also give the

appearance of an upward trend when there is not one. Regardless of whether there in an upward trend, there were an average of 10.2 (SD = 4.3) active shooter attacks at business locations in the last five years of the data.

Figure 1. ASEs in businesses by year
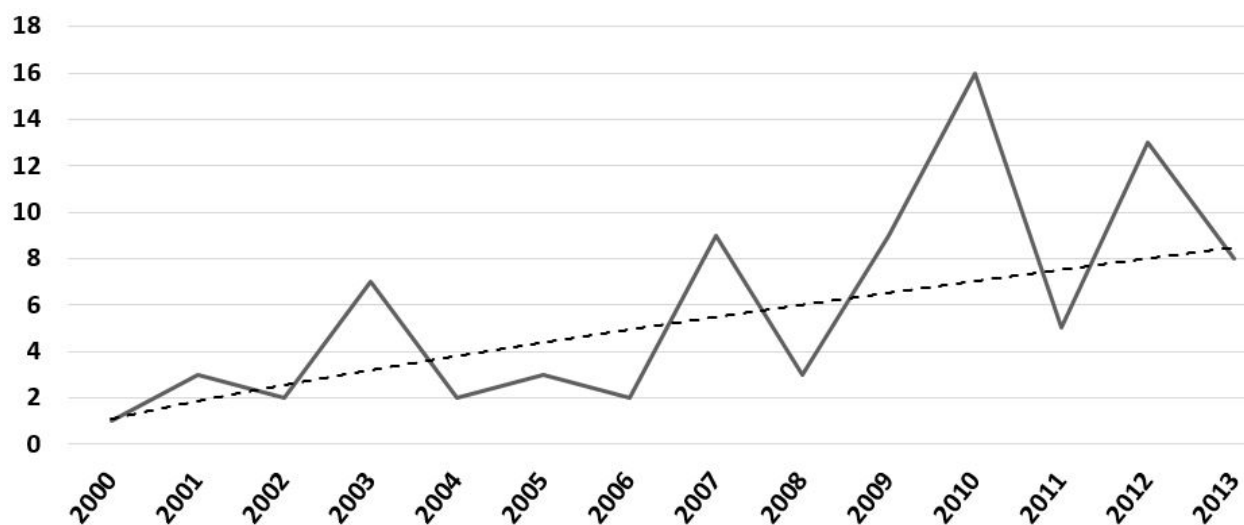
Shot and Killed

From 2000 to 2013, there were a total of 488 people shot in ASEs at businesses. If the attacker was shot, he or she was not included in this total. Figure 2 shows the number of individuals shot by event. The number of victims shot ranges from 0 to 70. The mean number of individuals shot was 5.88. The data distribution does not appear normal; therefore, a Shapiro-Wilk test of normality was undertaken. These data were found to be non-normal ($W(83) = .41$, p $< .001$) with a skewness of 6.71 ($SE = .26$), so the median was a better representation of the central tendency of the distribution. The median number of people shot was 4.

Figure 2. People shot in business ASEs by event
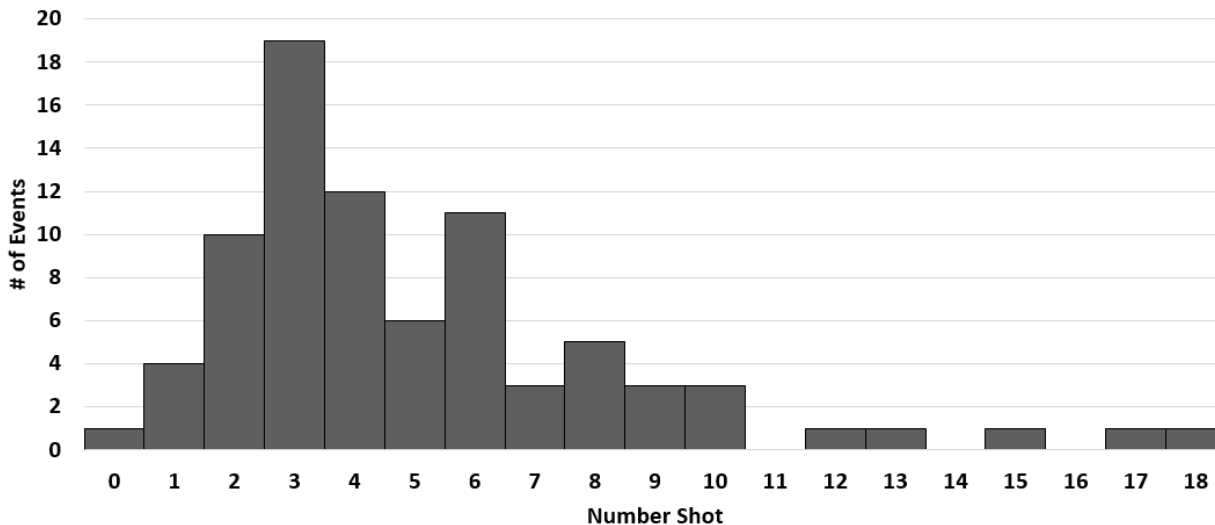
*Figure 2 only includes cases with 18 or fewer victims shot. One outlier case, the Aurora, CO movie theater shooting with 70 people shot, contained too many victims to be depicted in the graphic.

From 2000 to 2013, 216 people were killed during ASEs at businesses. The number killed ranges from zero to 12 (see Figure 3). It should be noted that if the shooter was killed, he or she was not included in this total. The mean number of people killed per event was 2.6. The distribution of people killed was also non-normal ($W(83) = .84$, $p < .001$) with a skewness of 1.572 ($SE = .264$) making the median a better measure of central tendency. The median number of people killed was two. Using the federal statute defining mass murder as three or more people killed, 33 (40%) of these events would qualify as mass murders (Investigative Assistance for Violent Crimes Act of 2012).

Figure 3. People killed in business ASEs by event
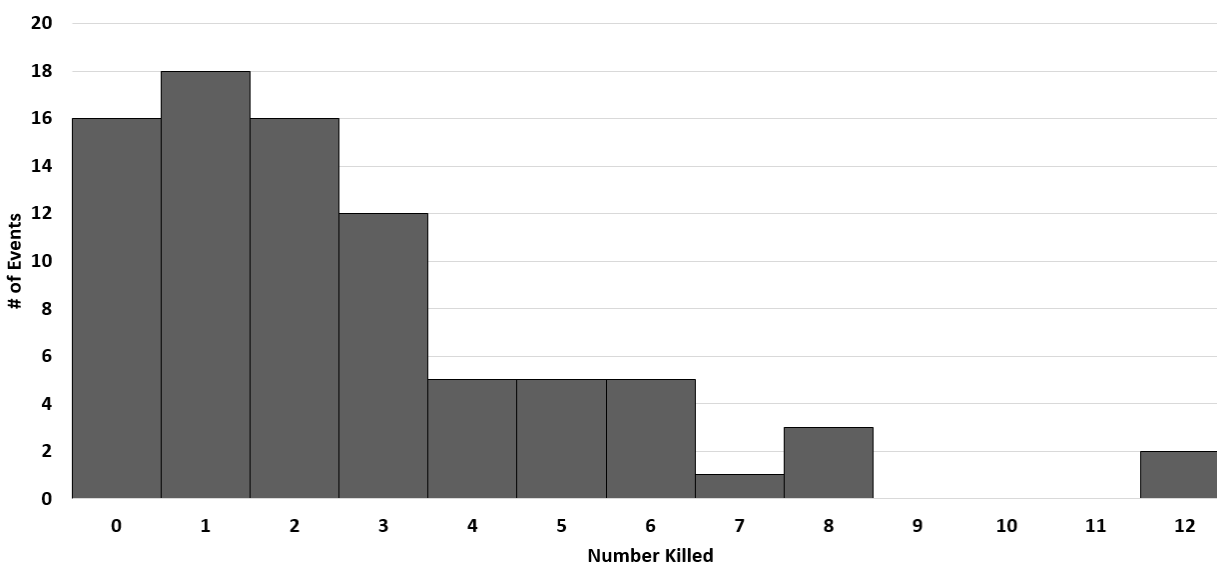
More people were shot (n = 241) and killed (n = 92) in retail locations than in factories/warehouses or offices. Retail businesses had a median of 4 people shot and a range between 0 and 70. The median number killed was 2 with a range between 0 and 12. While factory/warehouse sites were the least attacked locations, they were in the middle in terms of people shot (n = 130) and killed (n = 65). The median number of people shot at a factory/warehouse location was 6 with a range between 2 and 17 while the median number killed was 3 with a range between 0 and 6. Office based events had the fewest shot (n = 117) and killed (n = 59). Offices had a median of 3 people shot with a range between 1 and 15, and a median of 1 person killed with a range between 0 and 12.

Figure 4 provides the time the attack started for all of the attacks. The three distinct peaks occurred from 9 to 10 am, 11 am to 12 pm, and 3 to 4 pm. All but two attacks occurred during normal operating hours for the business. One of these cases involved a business executive calling an after-hours board meeting to discuss a financial dispute. When the board members arrived, he began firing at them killing three people and wounding one. The second case was a supermarket

employee who returned after his shift ended, during the stocking time for the closed store, and killed two co-workers.

Figure 4. Time of attack for all businesses
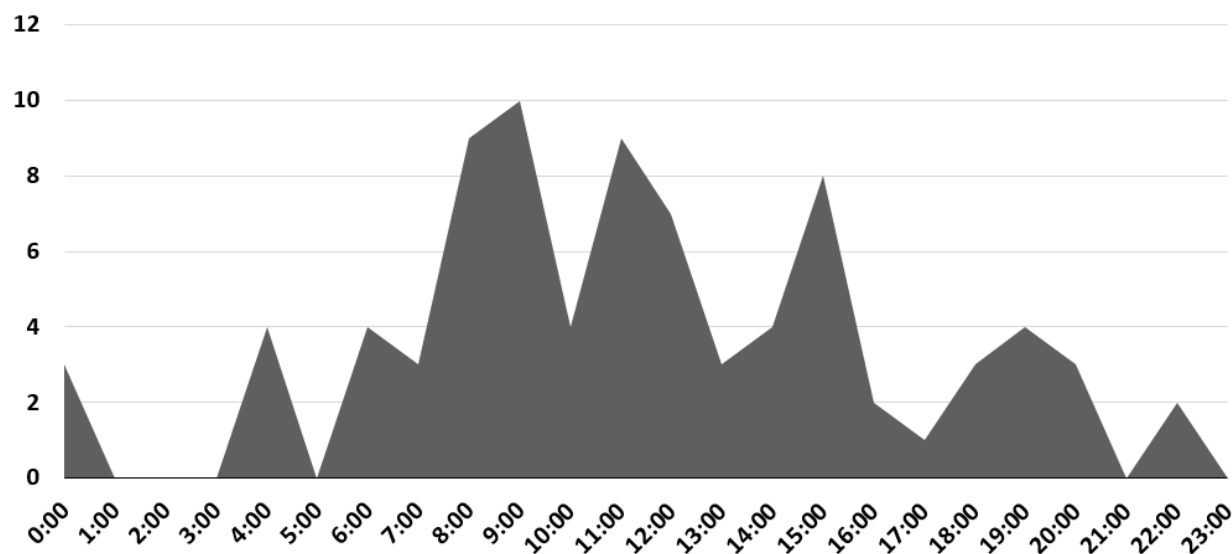
The day of the week with the highest number of business active shooter events was Wednesday (n = 19; 23%). Tuesday had the second highest number of events (n = 15; 18%). ASEs for the rest of the week, in descending order, are as follows: Thursday (n = 13; 16%), Friday (n =11; 13%), Monday (n = 10; 12%), and Sunday (n = 9; 11%). Saturday had the lowest number of events (n = 6; 7%)
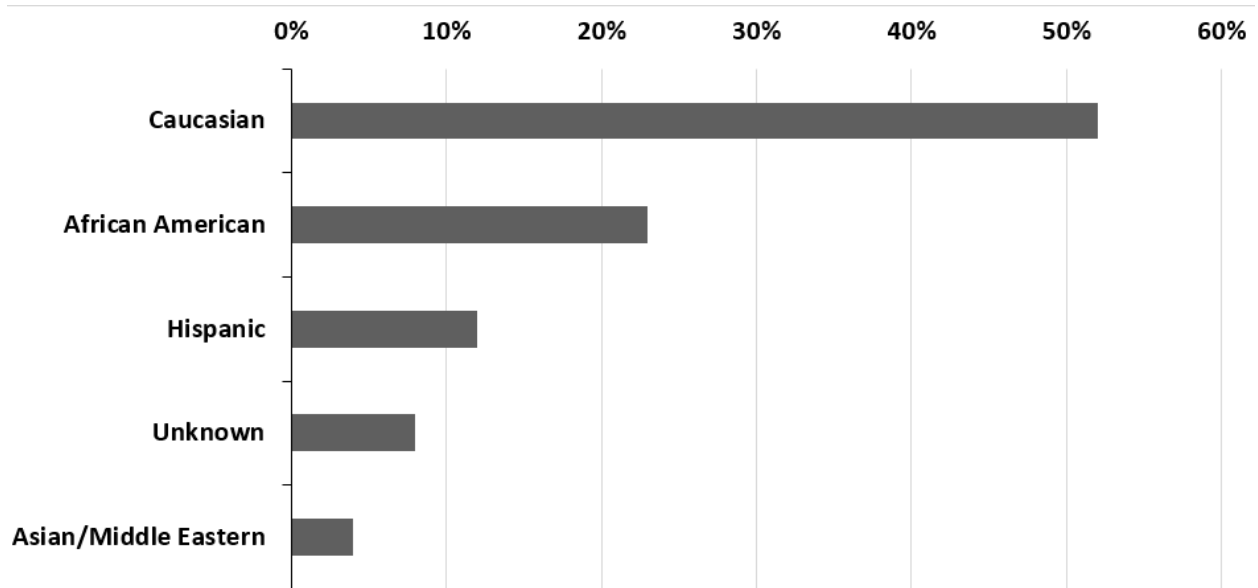
The Shooters

In all business cases there was a single shooter. The majority of shooters were male (n = 80; 96%), only three cases (4%) involved female shooters. Two of the female shooters attacked factory/warehouses. The other female attacked a retail location. Figure 5 shows the race of the shooter. Most shooters were Caucasian (n = 43; 52%) followed by African American shooters (n = 19; 23%) and Hispanic shooters (n = 10; 12%). Additionally, four shooters (5%) were classified as an "other" race. In seven cases, the race of the shooter was unknown or not listed

(8%). The racial distribution of shooters was similar to the overall racial distribution in the

United States.

Figure 5. Race of the attacker

The age of the shooters ranged from 18 to 88. As seen in Figure 6, the distribution is non-normal ($W(83) = .23$, $p < .000$) and positively skewed (6.2, $SE = .26$); therefore the median is the best measurement of central tendency. The median age of the shooters was 41.
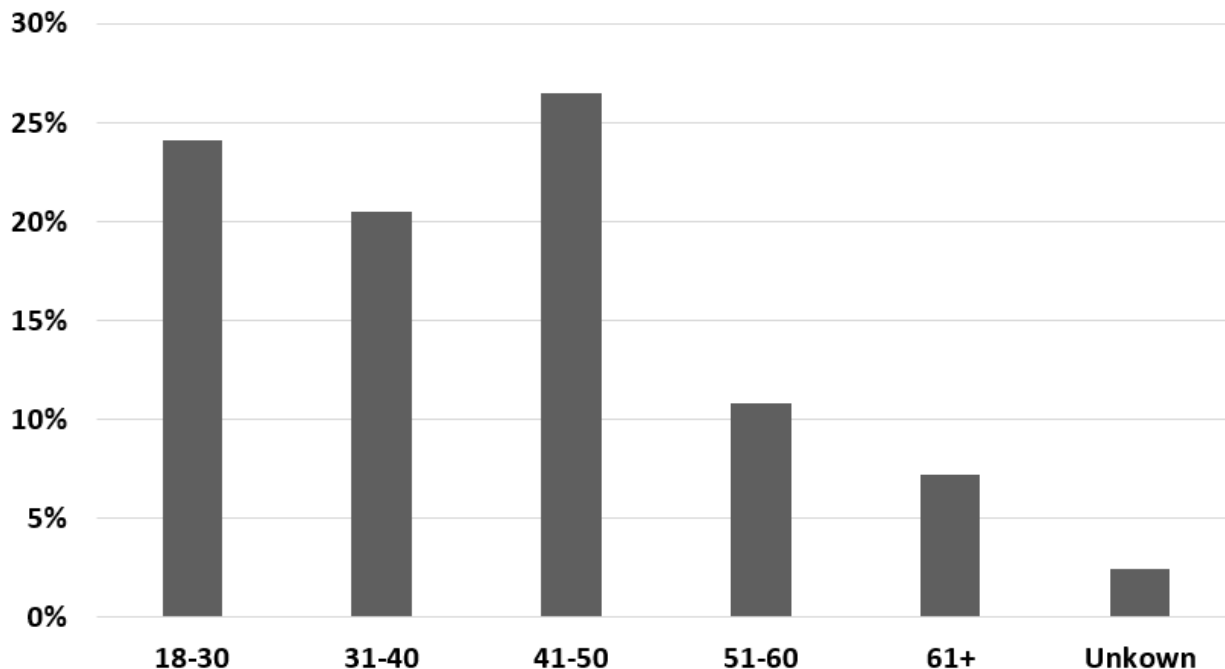
Figure 6. Age of the attacker

Figure 7 illustrates the shooter's relationship to the type of business attacked. In a

majority of the retail cases (n = 26, 76%) the attacker had no connection to the place attacked

while in factory/warehouse cases, a majority (n = 21, 95%) of the attackers had a connection to

the place. Offices fell in between these two, though a majority had connections with the office (n

= 15, 60%). There were two retail cases where the relationship of the attacker to the business was

unknown because they fled the scene and were still at large. While retail businesses are open to

the public, offices and factory/warehouses are usually closed to the public. Therefore, it would

be expected that offices and factory/warehouses would have higher percentages of shooters

having a relationship to the business.

There were six cases where a personal secondary relationship existed and three where

there was a professional secondary relationship. Three of the personal secondary relationships

occurred at offices while the other three occurred at retail businesses. All six personal secondary

relationship cases involved a man attacking his ex-wife's/wife's/girlfriend's place of work. Two of the three professional secondary relationships were that of attorney-client while the third was a doctor-patient relationship.

   We also examined cases involving employees who were suspended or terminated before beginning their attack. There were two factory/warehouse cases in which a person was suspended and returned to his or her place of work that day for the attack and three in which the person attacking had been fired that day. Three office cases and three factory/warehouse cases involved an attacker who had been fired and who returned to the business on a different day. In one case, a shooter had been fired for plotting to steal from the warehouse in 1994. He was later sentenced for other crimes and served time in prison. Upon release, he was sentenced for the crimes against the business. He attacked the warehouse the day before he was to report to jail.

Figure 7. Relationship by business type
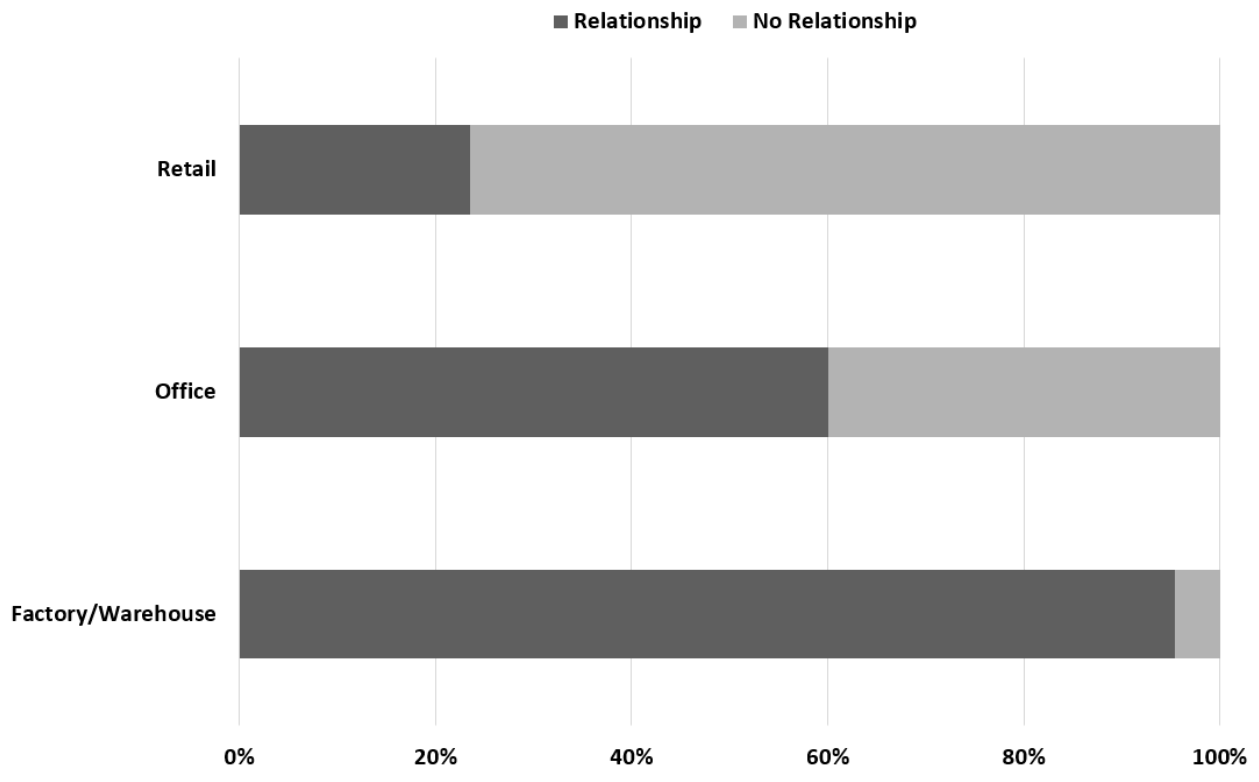
The most powerful weapon used was also studied. The weapons were ordered by their potential lethality (rifles, shotguns, pistols). Pistols were the most powerful weapon used in a majority (55%) of the cases while shotguns were used the least (13%). Rifles were utilized in 30% of the cases. In 65% of the business cases, only one weapon was used. Multiple weapons were most often used in offices (14%) followed by retail (11%) and factory/warehouses (10%). Explosives and body armor were used by the attacker in one case.

Resolution

Figure 8 depicts how the events at businesses ended. This figure is broken into two parts; events that ended before the police arrived and events that ended after the police arrived. Fifty-five percent of events ended before police arrived on scene while 45% ended after police arrived (n = 46 and n = 37, respectively).

For the events that ended before the police arrived, we identified two major resolution types. The attacker spontaneously stopped him or herself or the potential victims stopped the attacker. In 48% of the events, the attacker stopped on his or her own accord, either by committing suicide before the police arrived (n = 31; 37%) or leaving the scene (n = 9; 11%). Seven of those who left were apprehended at a later time and two were still at large at the time the information was gathered. In the cases where victims stopped the attacker (n = 6; 7%), civilians either shot the shooters (n = 3; 3.5%) or physically subdued the shooter until law enforcement arrived (n = 3; 3.5%). In two of the three cases where a civilian shot the shooter, the civilian was an on-duty, non-commissioned security guard for the business. In the third case, the shooting occurred at a retail store where an off-duty police officer was shopping.

The right half of the graphic represents the 45% of cases that were resolved after police arrived. The attacker committed suicide 11% (n = 9) of the time and surrendered to police only

5% (n = 4) of the time. The police shot the attacker in 21% (n = 17) of the cases and physically

subdued him or her using less lethal force in 8% (n = 7) of the events. Another way of looking at

these data is to examine only the right side of the graphic. In other words, treat the right half as

ASEs that are active when law enforcement arrives. This illustrates what law enforcement may

encounter when arriving at an ongoing scene. When law enforcement arrives at such an event,

the police shoot the attacker 46% of the time. This may pose an additional risk -out while

employees and customers are attempting to flee.

Figure 8. Endings of ASEs in businesses by number
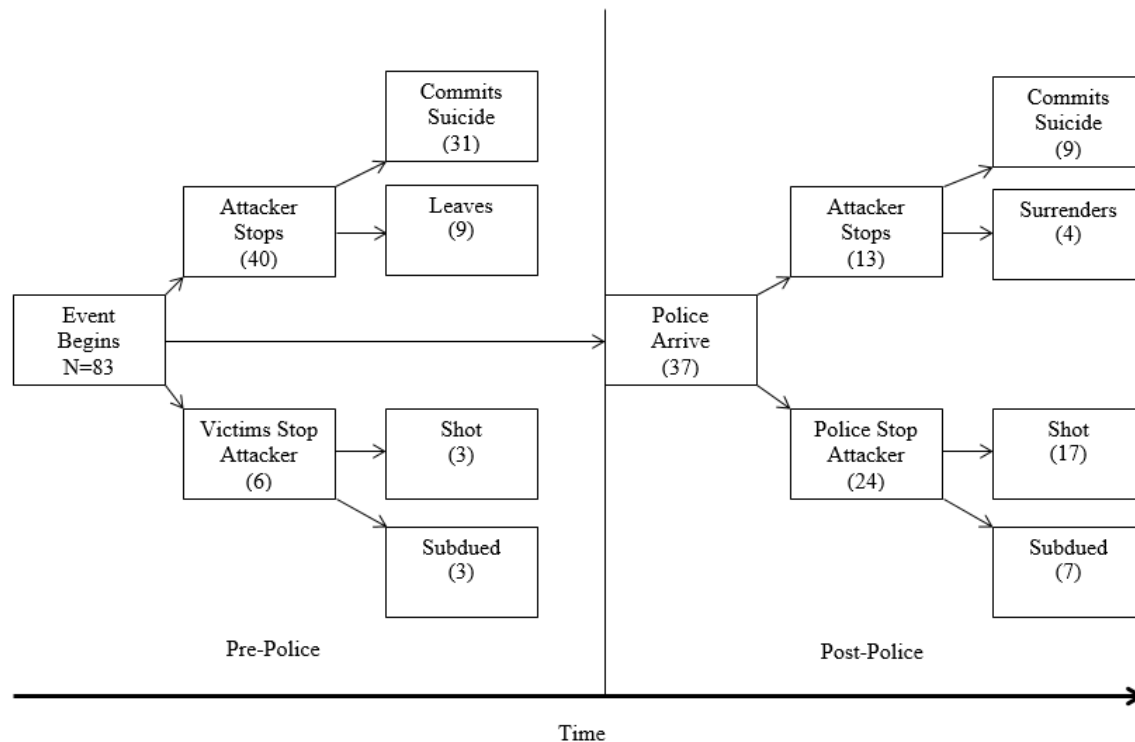
As mentioned above, a majority of the active shooter events (n = 46; 55%) ended before

police arrived. However, these events account for only 37% (n = 180) of victims shot and 44% (n

= 95) of victims killed. A majority of people both shot and killed were found in cases that ended

after the police arrived. Forty-five percent (n= 37) of cases ended after law enforcement arrived

on scene. The events ending after law enforcement arrived account for 63% (n = 308) of victims shot and 56% (n = 121) of victims killed. Forty-four percent (n = 95) of people killed came from events that ended before police arrived while 56% (n = 121) of people killed were in events that ended after police arrived. These data suggest that the speed with which events are resolved has an impact on the number of victims.

DISCUSSION

The overarching purpose of this study was to provide business owners, management, and law enforcement officers with detailed data regarding active shooter events in business settings. Our results show that there is *not* a specific demographic profile that can be utilized to identify potential active shooters in business environments. The shooters in our study were overwhelmingly, but not exclusively male. They came from every major racial/ethnic group in the country in proportions that were similar to their representation in the overall population, and they varied widely in age.

The also was not much of a pattern in terms of the time of day or day of the week of the attacks. Attacks were more likely to occur during standard 8 am to 5 pm working hours, but also occurred during other business hours. Forty-one percent of the attacks occurred on a Tuesday or Wednesday, but attacks frequently occurred on other days of the week.

Patterns were apparent in other areas. In more than 70% of the attacks that occurred in retail locations, the shooter was an outsider. However, almost all active shooter attacks at factories and warehouses were carried out by current or former employees. Thirty-six percent of office attackers were current or former employees, and 24% had a secondary relationship with the office. This suggests that it may be possible for an alert employer to intervene and prevent attacks. We will go into detail about this in the policy implications section.

More than half of the events that we examined ended before the police arrived on scene. These attacks also tended to have fewer people injured and killed. These events generally did not end because of random chance, but because the potential victims took effective actions to protect themselves. In cases where the shooter killed him or herself or left before the police arrived, it appears that the shooter engaged in an initial burst of violence and potential victims reacted by getting away from the attacker or barricading themselves in a safe location. The attacker would then engage in a brief search for more victims. When none were found, the attacker killed him or herself or left. In other cases where the attack ended before the police arrived, the potential victims physically subdued the attacker. These findings clearly suggest that the actions of potential victims during these attacks are important. We also discuss this more in the policy implications section.

Many (42%) of the attacks in this study were conducted by employees or former employees. Forty-five percent were conducted by people who were not part of the organization that was attacked. Both of these findings suggest that physical security (particularly access control) can be important in mitigating the damage caused by these attacks. This is also discussed in the next section.

POLICY IMPLICATIONS

Threat Assessment in the Workplace

Prior research has shown that active shooter events are generally not spontaneous events. Rather, the attacks occur after a downward spiral where the individual's behavior becomes more extreme over time (Nicoletti & Spencer Thomas, 2002). Ninety-one percent of factory attacks, 60% of office attacks, and 23% of retail attacks coming from individuals who were current employees, former employees, or had secondary relationships with the attack location. This

suggests that it is possible that some of these attacks could be prevented if efforts were made to identify employees who may be in the early phases of this downward spiral, a process formally known as threat assessment.

Threat assessment is a systematic strategy used to detect, assess, and manage threats and potentially violent behavior. A multi-disciplinary threat assessment team conducts the assessments. Potential team members include employees from human resources, security, legal, management, or representatives from general workforce. The size and composition of the team will depend on the individual company—e.g., large companies have larger numbers of personnel, potentially in many different departments. Smaller companies may need to seek outside help from law enforcement, mental health, and/or social services agencies while large companies may be able to leverage internal personnel to fill these roles (Rugala & Isaacs, 2003).

Once a concerning behavior or verbalized threat is reported, the threat assessment team examines the validity of the threat. The team can then develop an appropriate plan of action for each individual case. The FBI's *Workplace Violence*: *Issues in Response* report details the important role of threat assessment in maintaining a safe work environment (Rugala & Isaacs, 2003). It is important to consider this as a proactive approach to safety in the workplace. The majority of threats will likely be dismissed and some issues may be resolved. However, the process of evaluating all potential threats may result in saved lives.

The benefits of threat assessment do not end with the interdiction of a possible active shooter event. In fact, based on the workplace violence literature, the process of threat assessment may impact the more common physically and psychologically aggressive behaviors experienced by employees. The effectiveness of the assessment process is dependent on employee participation. Specifically, threats cannot be vetted if the team is not aware of them.

Training should be provided to employees on what constitutes a threat and what steps to take once a threat is witnessed. Individual businesses may operationalize what is considered a threat differently in order to meet their needs. For example, some may only be concerned about physical threats and choose to generally ignore other psychological forms of workplace violence (Rugala & Isaacs, 2003).

Management also needs to consider the ramifications of terminating an employee who has exhibited threatening behaviors. Terminating an individual without adequate preparation should be avoided. Ending employment for a disgruntled or agitated individual without a plan may result in the individual taking aggressive actions in the workplace. Steps should be taken to ensure the individual is observed after termination until the individual is off premises. Therefore, we suggest access cards, passcodes, and keys should be returned and/or changed as appropriate to limit the accessibility to the place of business if possible.

Training Employees to Respond Effectively

As was suggested in the discussion section, the actions of potential victims during an active shooter event can be critical in mitigating the damage. For example on August 5, 2013, a shooter first fired 28 bullets from a .223 caliber rifle at the exterior of the building and then made his way into the building. Once inside the building, he entered a meeting room and opened fire. While he was firing his weapon, two civilians subdued and disarmed him. The shooter was able to kill three and wound three others, but the actions of the civilians undoubtedly prevented further death and injury from occurring (Hall, 2013).

Businesses should be proactive in training their employees to respond to an active threat. Individual businesses may have policies in place regarding evacuation procedures in the case of an emergency; however, evacuation practice alone will not be sufficient in a dynamic situation.

The above active shooter example would have ended differently had the civilians simply tried to evacuate by going past the shooter. Businesses can, and should, be proactive in establishing policies for their employees. For example, printed material regarding active shooter responses can be displayed alongside mandated building evacuation procedures and general emergency information. Some companies are currently engaged in educating employees about response tactics regarding active shooter events. For example, Walmart has developed and active shooter response training video which is being disseminated along with other materials to all of their employees (Gerber, 2015). We encourage businesses to follow this proactive approach to active shooter training.

Currently, there are several professional organizations that have produced training programs and advice on how to properly respond to an attack. Many of these programs instruct civilians how to respond based on the situation at hand. For example, the Advanced Law Enforcement Rapid Response Training (ALERRT) Center at Texas State University has long taught a system called *Avoid, Deny, Defend*, which helps individuals evaluate how and when to use each option. Civilians are trained to try and *avoid* the shooter (e.g., get away) as their first option. If avoiding the shooter is not an option, the civilian should *deny* the shooter access to the area that the civilian is in (e.g., lock or barricade a door). If all else fails, civilians should be prepared to *defend* themselves. It is important for everyone to know that they have the right to defend themselves in a life or death situation. Examples of defending include, but are not limited to, swarming the shooter or using any available object to attack the shooter.

The City of Houston also produced a 6-minute video called *Run, Hide, Fight*. This video was adopted as the federal standard response program in 2013. Many private companies have developed systems, and there are many options available. We encourage business owners and

management to consider these various training models. Businesses should consider how they might modify their plans, policies, and procedures to include a more comprehensive training and operations plan to deal with active shooter events.

Physical Security Opportunities

Physical security changes to buildings may also have an impact on the survivability of civilians. Case studies of active shooter events have shown that denying entry can protect lives (Blair, Nichols, Curnutt, Burns, 2012). If the shooter cannot gain access to potential victims, he or she is unable to inflict the intended harm. However, access control can be difficult when one considers many business locations. We believe there are two distinct areas in which access control warrants further consideration: exterior and interior.

Exterior Access Control. The idea of concentric access control is well established in the world of physical security. That is, the innermost areas are the most secure. In order to access the inner area, one must gain access through various layers of security. Therefore, we believe exterior control mechanisms are warranted where possible. We use "exterior control" as a blanket term to denote any security feature utilized to keep a potential threat out of the building. These mechanisms include, but are not limited to, fences, controlled parking for employees and guests, guard posts, and lockable exterior doors. The type of business location will determine the extent to which one can implement exterior control. For example, fences, guards, and locked doors would not be feasible in a public shopping center. However, these mechanisms could fit well within a factory/warehouse or private office building.

Exterior access doors can be equipped with keys, access cards, and/or keypad locks. Locations that receive a high volume of packages and/or visitors may implement a buzzer system or use a security vestibule to regulate outside access. A security vestibule is a secured room

entered immediately upon entering the exterior door. These are sometimes utilized as reception areas with a business representative behind a secure window. The representative generally controls access to the rest of the facility. A security vestibule acts as a transition from exterior access to interior access within the building.

Interior Access Control. If exterior access control does not work, or is not in place, the shooter will gain access to the interior of the building. Once the shooter is inside, it is still possible to limit the attacker's ability to move freely. One essential method of access control is simply locking doors. In the U.S. no active shooter has successfully breached a locked door. There are a variety of door lock options (e.g., push button, key, thumb-turn, or deadbolt). We recommend the use of deadbolt locks that do not require a key. This is for two reasons. First, a deadbolt is better able to resist attacks than many other type of locks. Second, when people are under life-threatening stress, the frequently lose fine motor skills and near vision (Grossman & Christensen, 2007; Ripley, 2008). The loss of fine motor skills and near vision would make it difficult for an individual to lock a door utilizing keys.

Credentials. A key aspect of both exterior and interior security is the implementation of business-wide employee credentials. Many businesses and schools have implemented policies that require students and staff to display valid credentials at all times. Furthermore, visitors are required to check-in with the receptionist and receive a visitor's pass. Students and staff are trained to look for, and report, individuals without the proper credentials. This type of practice has already been adopted by many businesses and we encourage those that have not to consider it. Credentials can also be integrated with access control through the use of RFID chip enabled badges or key fobs. This process would give employees fast access to secured areas.

Additionally, if an employee is terminated, management can easily restrict his or her access to the facility without having to change keys and/or keypad combinations.

LIMITATIONS AND FUTURE RESEARCH

Like all studies, this one was limited by the quality of the available data. While the data examined for this study were the most comprehensive available, it is possible that relevant events were not found and that these undiscovered cases could change the findings. The data sources used to code the cases were also incomplete and imperfect. Some of the coded details may therefore be incorrect and these errors or omissions could also affect the results. Despite these limitations, we feel that the study makes a substantial contribution to our understanding of business-related active shooter events.

Future research should continue to expand upon the descriptive work reported here. The development of a typology of attacks is a potential next step. Such a typology would also be useful in beginning to develop a theoretical framework from which these events can be examined.

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