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LEVERAGING BYSTANDER EMERGENCE IN MASS CASUALTY INCIDENTS

by

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September 2020

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Following many recent intentional mass casualty incidents (MCIs), bystanders have come to the rescue, helping those around them. These active bystanders, known as immediate responders, have saved lives by providing immediate care for life-threatening injuries, evacuating victims, and transporting the injured to hospitals. However, immediate responders also tend to overwhelm the closest hospital and inaccurately prioritize victims for treatment. Emergency responders must manage this emergent response to leverage the benefits of the extra help but to avoid unintended consequences. A literature review and analysis of recent MCIs reveals that existing planning assumptions do not account for bystander help; this thesis recommends a new paradigm for MCI management that takes into account the complexity of MCIs, including immediate responder emergence, and includes suggestions for training incident commanders to operate in these novel and complex environments. The thesis also provides recommendations for encouraging bystanders to become immediate responders by creating a helping culture, which can include providing community training and bolstering laws to protect Good Samaritans.

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LEVERAGING BYSTANDER EMERGENCE IN MASS CASUALTY INCIDENTS

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ABSTRACT

Following many recent intentional mass casualty incidents (MCIs), bystanders have come to the rescue, helping those around them. These active bystanders, known as immediate responders, have saved lives by providing immediate care for life-threatening injuries, evacuating victims, and transporting the injured to hospitals. However, immediate responders also tend to overwhelm the closest hospital and inaccurately prioritize victims for treatment. Emergency responders must manage this emergent response to leverage the benefits of the extra help but to avoid unintended consequences. A literature review and analysis of recent MCIs reveals that existing planning assumptions do not account for bystander help; this thesis recommends a new paradigm for MCI management that takes into account the complexity of MCIs, including immediate responder emergence, and includes suggestions for training incident commanders to operate in these novel and complex environments. The thesis also provides recommendations for encouraging bystanders to become immediate responders by creating a helping culture, which can include providing community training and bolstering laws to protect Good Samaritans.

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LIST OF ACRONYMS AND ABBREVIATIONS

AAR	after-action report
AED	automated external defibrillator
CPR	cardiopulmonary resuscitation
EMS	emergency medical services
ICS	Incident Command System
MCI	mass casualty incident
NIMS	National Incident Management System
OHCA	out-of-hospital cardiac arrest

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EXECUTIVE SUMMARY

Mass casualty emergency response plans are predicated on a number of assumptions, most of which were developed many decades ago. One assumption is that victims and bystanders will rely solely on emergency medical services to get to the scene, take control of the response, provide initial treatment, and transport victims to hospitals. In this sense, response plans expect bystanders to be the typical, passive definition of the term: "A person who is present at an event of incident but does not take part."[1]

Many recent mass casualty incidents (MCIs) have been intentional, caused by an antagonist targeting a large group with violence to cause mass injuries and deaths. During those events, bystanders have been active on the scene by helping those around them, becoming what has been coined *active bystanders* or *immediate responders*.[2] Faced with both shocking injuries and the terror of a violent attack, many victims and immediate responders—mindful of the risk of further violence—are more inclined to treat one another and leave the area of the attack long before emergency medical services can arrive.[3]

While public safety agencies have acknowledged the actions of immediate responders following an intentional MCI, there remains little research guiding best use of these bystanders as a response resource. As the frequency, magnitude, and severity of intentional MCIs have increased, the role and ubiquity of the immediate responder has become more apparent. While extra helping hands may make a meaningful difference in terms of lives saved, professional responders must manage this emergent response to avoid unintended consequences. The incident management constructs, many of which can be traced to the civil defense era, have resulted in suboptimal responses when applied to these

[1] Lexico, s.v."bystander," accessed June 4, 2020, https://www.lexico.com/en/definition/bystander.

[2] Isaac Ashkenazi and Richard C. Hunt, "You're It—You've Got to Save Someone: Immediate Responders, Not Bystanders," *Frontiers in Public Health*, December 5, 2019, https://doi.org/10.3389/fpubh.2019.00361.

[3] Erik Auf der Heide, "The Importance of Evidence-Based Disaster Planning," *Annals of Emergency Medicine* 47, no. 1 (January 2006): 34–49, https://doi.org/10.1016/j.annemergmed.2005.05.009.

new circumstances. This thesis explores how response agencies can adapt policies, plans, and procedures to account for and encourage bystanders to become immediate responders.

Recent MCIs, particularly those caused by acts of violence, have featured immediate responder action that affected the response. After-action reports, media reports, and literature have shown undesirable side effects because existing policies and procedures did not account for immediate responder participation. The thesis examines case studies of MCIs and immediate responder behavior. The research also reviews the applicable policies, procedures, and approaches of emergency response agencies, and how such models have impacted the response outcome. The evidence shows the scale and scope of the problem and reveals the unintended consequences of immediate responder action. The thesis also discusses stereotypes about expected bystander response to determine if they are valid. The sociological theories and constructs that apply to MCI management and bystander behavior are then applied to inform alternative approaches to optimize immediate responder action.

Throughout this analysis, the thesis reviews a sample of five domestic and international intentional incidents since 2000: the 2001 World Trade Center attack, the 2004 Madrid train bombings, the 2013 Boston Marathon bombing, the 2016 Pulse Nightclub shooting, and the 2017 Las Vegas Route 91 Harvest Festival shooting. These events were chosen because they had a systemic impact on the health care system due to the quality of the incident or quantity of patients, and featured pronounced immediate responder action. The cause of the incidents, the nature of the scenes and injuries, and the response, with an emphasis on immediate responder activity following the event, are examined. Specifically, the research investigates the positive and negative outcomes of immediate responder emergence, and the analysis identifies patterns and correlations in incident conditions and immediate responder actions.

After-action reports, literature, and media coverage show that outdated MCI approaches cause less severely injured victims to transport themselves first, overwhelming

the closest hospital.[4] Hospitals often misperceive this first wave of patients as representative of all injuries when, in reality, far more severe patients remain on the scene.[5] Bystanders also fail to use additional surrounding hospitals or specialty centers, which are designed for the traumatic injuries common in these events. Emergency medical services resources converge on the scene, not knowing that their services may be better used to redistribute patients already transported by immediate responders.[6] These findings expose misconceptions about bystanders and helping behavior that have contributed to this resource being discounted in emergency planning. The research herein challenges assumptions related to disaster syndrome, panic, and social breakdown that have prevented response plans from incorporating bystanders. In contrast to these myths, the thesis shows that immediate responders exhibit a sociological construct known as emergence following an MCI, and that they can be leveraged as part of a response plan.

Incident commanders currently struggle, however, to manage emergent immediate responders. Many of the structures used by public safety organizations for incident management are derived from military applications, which use a hierarchical command-and-control model to identify clear objectives, lines of authority, and divisions of labor. These constructs drive routine emergency response and are effective for managing small-scale incidents. However, the Incident Command System (ICS) and National Incident Management System (NIMS), which are routinely used by these commanders, are inadequate during large MCIs, especially those with immediate responder emergence. Successful leadership will require a diversion from the traditional applications, requiring commanders to adopt a method that takes into account the complexity and uncertainty.

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[4] Federal Emergency Management Agency, *1 October After-Action Report: Las Vegas Shooting* (Washington, DC: Department of Homeland Security, 2018), https://www.hsdl.org/?view&did=814668; Annelie Holgersson, "Review of On-scene Management of Mass-Casualty Attacks," *Journal of Human Security* 12, no. 1 (2016): 91–111, http://doi.org/10.12924/johs2016.12010091; Auf der Heide, "The Importance of Evidence-Based Disaster Planning."

[5] Auf der Heide, "The Importance of Evidence-Based Disaster Planning."

[6] Alejandro López Carresi, "The 2004 Madrid Train Bombings: An Analysis of Pre-hospital Management," *Disasters* 32, no. 1 (2008): 41–65, https://doi.org/10.1111/j.1467-7717.2007.01026.x; M. G. Guttenberg, A. Asaeda, and A. Cherson, "Utilization of Ambulance Resources at the World Trade Center: Implications for Disaster Planning," *Annals of Emergency Medicine* 40, no. 92 (2002).

These MCIs call for a new paradigm for approaching incident management—one that incorporates sensemaking, probing, analysis, responsiveness, and agility.

This thesis considers two concepts that may provide a more effective means of managing today's complex MCIs: operating at the edge of chaos and leadership through the Cynefin framework. This sensemaking framework allows the incident commander to understand the environment, recognizing that each of the elements of the system of MCI response may be in its own domain of complexity. Based on the findings of the sensemaking, incident commanders can allow emergent groups to function organically while orchestrating other aspects of the response, such as professional rescuer assignments. This model of management more closely aligns with the complex environment, thereby allowing for more effective incident leadership and advancement toward a resolution.

The thesis also proposes development for the person or team that manages immediate responders at an intentional MCI, proposing new skills that will allow the incident commander to think through the complex environment and guide resources toward resolution. Recognizing the benefits of immediate responder action, as well as the need to mitigate unintended consequences, the thesis examines means to develop a culture of helping behavior. Finally, recommendations for leveraging immediate responders to provide the best possible outcome for victims of, and responders to, intentional MCIs are provided. These include pre- and post-incident approaches. The recommendations are:

- Using public safety assets at hospitals
- Reconfiguring incident management processes to coincide with the unique demands of this type of event
- Developing the incident commander to be able to analyze work in a novel, complex environment to effectively manage the incident
- Delivering training to the public

- Bolstering and standardizing Good Samaritan laws
- Conducting further research to better understand and manage immediate responder action

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I. INTRODUCTION

A. PROBLEM STATEMENT

Mass casualty emergency response plans are predicated on a number of assumptions, most of which were developed many decades ago. One such assumption is that victims and bystanders will rely solely on emergency medical services to get to the scene, take control of the response, provide initial treatment, and transport victims to hospitals. In this sense, response plans expect bystanders to fill the typical, passive definition of the term: "A person who is present at an event of incident but does not take part."[1]

Many recent mass casualty incidents (MCIs) have been intentional, caused by an antagonist targeting a large group with violence to cause mass injuries and deaths. During these events, bystanders have been active on the scene by helping those around them, becoming what has been coined *active bystanders* or *immediate responders*.[2] Faced with both shocking injuries and the terror of a violent attack, many victims and immediate responders—mindful of the risk of further violence—are more inclined to treat one another and leave the area of the attack long before emergency medical services can arrive.[3] While the actions of immediate responders following an intentional MCI have been acknowledged, there remains little research guiding best use of this asset as a response resource. As the frequency, magnitude, and severity of these intentional MCIs have increased, the role and ubiquity of the immediate responder has become more apparent. While extra helping hands may make meaningful differences in terms of lives saved, professional emergency responders must manage this emergent response to avoid the unintended consequences that have resulted during recent events. The incident

[1] Lexico, s.v."bystander," accessed June 4, 2020, https://www.lexico.com/en/definition/bystander.

[2] Isaac Ashkenazi and Richard C. Hunt, "You're It—You've Got to Save Someone: Immediate Responders, Not Bystanders," *Frontiers in Public Health*, December 5, 2019, https://doi.org/10.3389/fpubh.2019.00361.

[3] Erik Auf der Heide, "The Importance of Evidence-Based Disaster Planning," *Annals of Emergency Medicine* 47, no. 1 (January 2006): 34–49, https://doi.org/10.1016/j.annemergmed.2005.05.009.

management constructs that first responders follow, many of which can be traced to the civil defense era, have resulted in suboptimal responses when applied to these new circumstances.

After-action reports, literature, and media coverage of numerous noteworthy incidents have shown that the outdated MCI approaches manifest in practical implications for patients and the health care system. Less severely injured victims tend to transport themselves first, overwhelming the closest hospital.[4] Hospital personnel often misperceive this first wave of patients with minor injuries as representative of all casualties when, in reality, far more severe patients remain on the scene.[5] When patients transport themselves to the closest hospital, they fail to use additional surrounding hospitals or specialty centers, which are specially designed for the traumatic injuries that are common in these events. Emergency medical services (EMS) resources converge on the scene, not knowing that their services may be better used to redistribute patients already transported by immediate responders.[6] This thesis explores how response agencies' plans, policies, and procedures can best leverage immediate responders to meet the unique demands of a violent MCI.

B. LITERATURE REVIEW

Bystander response to mass casualty incidents has changed in recent years—or perhaps the impressions that first responders have of bystanders have simply shifted. The purpose of this literature review is to explore the evolution of bystander behavior following an emergency. The review traces explanations for why many researchers once asserted that bystanders were unwilling to help, but now play a major role in disaster response during mass casualty events, becoming immediate responders.

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[4] Federal Emergency Management Agency, *1 October After-Action Report: Las Vegas Shooting* (Washington, DC: Department of Homeland Security, 2018), https://www.hsdl.org/?view&did=814668; Auf der Heide, "The Importance of Evidence-Based Disaster Planning."

[5] Auf der Heide, "The Importance of Evidence-Based Disaster Planning."

[6] Alejandro López Carresi, "The 2004 Madrid Train Bombings: An Analysis of Pre-hospital Management," *Disasters* 32, no. 1 (2008): 41–65, https://doi.org/10.1111/j.1467-7717.2007.01026.x M. G. Guttenberg, A. Asaeda, and A. Cherson, "Utilization of Ambulance Resources at the World Trade Center: Implications for Disaster Planning," *Annals of Emergency Medicine* 40, no. 92 (2002).

Social psychologists began studying bystander behavior in the 1960s. The early work was prompted by the murder of Kitty Genovese in New York City, where it was reported that thirty-eight people witnessed the crime but did not intervene.[7] Though this case of a single murder differs from an MCI, this early research contributed to the assumption that bystanders would not help in an emergency of any scale. John Darley and Bibb Latane concluded that bystanders fail to provide assistance when they are part of a larger group of bystanders, a phenomenon coined the *bystander effect.*[8] They attribute bystanders' inaction to the diffusion of responsibility—the presence of other bystanders reduces the responsibility each person feels—or pluralistic ignorance—the presence of others, especially those who react calmly, makes bystanders believe the event is not an emergency.[9] Later, Latane and Darley added a third factor, evaluative apprehension—the fear of public judgment for intervening dissuades bystanders from acting.[10]

Based on Latane and Darley's findings, group dynamics, specifically the behavioral and psychological changes that occur when others are present, help explain why bystanders fail to act. In the following years, researchers continued to observe the same bystander inaction in a variety of settings.[11] Latane and Steve Nida found that as group size increases, helping behaviors decrease.[12] Shalom Schwartz and Geraldine Clausen tested various

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[7] Arthur J. Lurigio, "Crime Narratives, Dramatizations, and the Legacy of the Kitty Genovese Murder: A Half Century of Half Truths," *Criminal Justice and Behavior* 42, no. 7 (July 2015): 782–89, https://doi.org/10.1177/0093854814562954.

[8] Bibb Latane and John M. Darley, "Group Inhibition of Bystander Intervention in Emergencies," *Journal of Personality and Social Psychology* 10, no. 3 (November 1968): 215–21, http://dx.doi.org/10.1037/h0026570.

[9] Bibb Latane and John M. Darley, "Bystander 'Apathy,'" *American Scientist* 57, no. 2 (1969): 244–68.

[10] Latane and Darley.

[11] Ruud Hortensius and Beatrice de Gelder, "From Empathy to Apathy: The Bystander Effect Revisited," *Current Directions in Psychological Science* 27, no. 4 (2018): 249–256, https://doi.org/10.1177/0963721417749653.

[12] Bibb Latane and Steve Nida, "Ten Years of Research on Group Size and Helping," *Psychological Bulletin* 89, no. 2 (March 1981): 308–24, http://search.proquest.com/docview/63552441?rfr_id=info%3Axri%2Fsid%3Aprimo.

group sizes and compositions, all of which revealed bystanders failing to act.[13] Victor Harris and Carol Robinson hypothesized that bystanders are more inclined to help when confronted with a critical event, but they found the same bystander inaction in serious incidents, including acute asthma attacks and epileptic seizures.[14] Even in noncritical events, such as when pencils spill to the ground, bystanders fail to help, as shown by Latane and James Dabbs.[15] The studies show that when in groups, bystanders consistently fail to act when presented with a person in distress.

Researchers initially thought that lone bystanders would be more likely to help if no group was present, attributing bystander inaction to the diffusion of responsibility, pluralistic ignorance, and evaluative apprehension.[16] Without other bystanders present, researchers believed lone bystanders may be more inclined to act. However, in Latane and Darley's 1968 study, 25 percent of lone bystanders failed to act when simulated smoke was pumped into the room to suggest a nearby fire.[17] Likewise, Judith Rodin found that 30 percent of single bystanders did not help a victim who had fallen.[18] These studies consistently found that bystanders would not come to the aid of those in need, whether they were alone or in a group, but did not explain why.

Social psychologists began to hypothesize that bystanders' understanding of an event exerts the most influence on their response. Differing from many earlier studies, Irving Piliavin, Rodin, and Jane Piliavin found that sixty-two of sixty-five sick subjects

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[13] Shalom H. Schwartz and Geraldine T. Clausen, "Responsibility, Norms, and Helping in an Emergency," *Journal of Personality and Social Psychology* 16, no. 2 (October 1970): 299–310, http://doi.org/10.1037/h0029842.

[14] Victor A. Harris and Carol E. Robinson, "Bystander Intervention: Group Size and Victim Status," *Bulletin of the Psychonomic Society* 2, no. 1 (July 1973): 8–10, https://doi.org/10.3758/BF03327696.

[15] Bibb Latane and James M. Dabbs, "Sex, Group Size and Helping in Three Cities," *Sociometry* 38, no. 2 (June 1975): 180, https://doi.org/10.2307/2786599.

[16] Peter Fischer et al., "The Bystander-Effect: A Meta-analytic Review on Bystander Intervention in Dangerous and Non-dangerous Emergencies," *Psychological Bulletin* 137, no. 4 (July 2011): 517–37, http://doi.org/10.1037/a0023304; Russell D. Clark and Larry E. Word, "Where Is the Apathetic Bystander? Situational Characteristics of the Emergency," *Journal of Personality and Social Psychology* 29, no. 3 (March 1974): 279–87, http://doi.org/10.1037/h0036000.

[17] Latane and Darley, "Bystander 'Apathy.'"

[18] Latane and Darley.

received help.[19] Likewise, Russell Clark and Larry Word demonstrated that 100 percent of bystanders, whether in a group or alone, helped when presented with an emergency.[20] In both cases there was a clear emergency with an obvious victim and a critical need for action. These studies suggest that it is not group dynamics, as previously suggested, but rather the presence of ambiguity that dissuades bystanders from acting. If bystanders merely overhear an accident or do not otherwise see a victim, they often misinterpret the seriousness of the emergency, thereby stifling action.[21] Bystanders act when they are confident that an emergency has occurred.[22] When bystanders are less certain of the situation, they often look to other bystanders for direction, leading to bystanders providing delayed help or no help at all.[23] This literature shows that a bystander who has a clear understanding of the situation is more likely to help.

Further probes of bystander motivations have explored the risk-benefit analysis of potential helpers. By helping someone, a bystander might experience a range of outcomes, from embarrassment to death. The nonresponsive bystanders in Bruce Denner's experiment reported that because they were unsure whether they had witnessed a crime, they were embarrassed to report it.[24] Further supporting this risk analysis concept, Piliavin and Piliavin showed that victims are less likely to be helped if they are covered in blood, undermining the ambiguity argument but suggesting an aversion to higher risk.[25] In Piliavin, Rodin, and Piliavin's experiment, an intoxicated victim who demonstrated the

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[19] Irving M. Piliavin, Judith Rodin, and Jane A. Piliavin, "Good Samaritanism: An Underground Phenomenon?" *Journal of Personality and Social Psychology* 13, no. 4 (December 1969): 289–99, http://doi.org/10.1037/h0028433.

[20] Russell D. Clark and Larry E. Word, "Why Don't Bystanders Help? Because of Ambiguity?" *Journal of Personality and Social Psychology* 24, no. 3 (December 1972): 392–400, http://doi.org/10.1037/h0033717.

[21] Clark and Word, "Where Is the Apathetic Bystander?"

[22] Bruce Denner, "Did a Crime Occur? Should I Inform Anyone? A Study of Deception," *Journal of Personality* 36, no. 3 (1968): 454–65, https://doi.org/10.1111/j.1467-6494.1968.tb01485.x.

[23] Clark and Word, "Where Is the Apathetic Bystander?"

[24] Denner, "Did a Crime Occur?"

[25] Jane Allyn Piliavin and Irving M. Piliavin, "Effect of Blood on Reactions to a Victim," *Journal of Personality and Social Psychology* 23, no. 3 (September 1972): 353, http://search.proquest.com/docview/1295929262?rfr_id=info%3Axri%2Fsid%3Aprimo.

potential for physical harm was less likely to receive help than someone suffering a cardiac emergency.[26] Each of these studies supports the concept that bystanders conduct a risk-benefit analysis, though they may not consciously do so.[27] Clark and Word concluded that a bystander who feels safe is more likely to help.[28]

C. RESEARCH QUESTION AND DESIGN

Recent MCIs, particularly those caused by acts of violence, have featured immediate responder action that affected the response and caused unintended consequences—often because existing emergency response policies and procedures do not account for immediate responder participation. This thesis asked the question: How can response agencies adapt policies, plans, and procedures to account for and encourage bystanders to become immediate responders? To do so, the thesis examined case studies of MCIs and immediate responder behavior in five domestic and international incidents since 2000: the 2001 World Trade Center attack, the 2004 Madrid train bombings, the 2013 Boston Marathon bombing, the 2016 Pulse Nightclub shooting, and the 2017 Las Vegas Route 91 Harvest Festival shooting. These events were chosen because they had a systemic impact on the health care system due to the quality of the incident or quantity of patients. The cause of the incidents, the nature of the scenes and injuries, and the response, with an emphasis on immediate responder activity following the event, were examined.

The thesis also reviewed the applicable policies, procedures, and approaches of emergency response agencies, and how such models have impacted the outcome of MCI responses. The evidence found in these incident reviews illuminates the scale and scope of the problem and shows the unintended consequences of immediate responder action. Stereotypes about expected bystander response were examined to determine if they are valid. The sociological theories and constructs that apply to MCI management and

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[26] Piliavin, Rodin, and Piliavin, "Good Samaritanism."

[27] Denner, "Did a Crime Occur?"; Piliavin and Piliavin, "Effect of Blood on Reactions to a Victim"; Piliavin, Rodin, and Piliavin, "Good Samaritanism."

[28] Clark and Word, "Where Is the Apathetic Bystander?"

bystander behavior were applied to inform alternative approaches to optimize immediate responder action.

To examine the actual incidents, government-issued or -endorsed after-action reviews of the MCIs were reviewed, but the reviews have several limitations. First, many of the reviews are agency-specific and therefore do not account for the continuum of care or the broader systemic impacts. Second, while several of the reports acknowledge immediate responder action, they do so superficially and do not provide detailed accounts of the behavior or the impacts on the response. Instead, the reports focus on the behavior and performance of the public safety personnel. To fill in the gaps, reputable media reports and peer-reviewed literature were also used to inform a more comprehensive examination of the event and response. Incidents were chosen because they featured a level of immediate responder action that impacted the response and outcome throughout the health care spectrum, and caused challenges to MCI response plans. The examples are meant to illustrate the characteristics of immediate responder action and enumerate its common effects. The group of events studied is not exhaustive; it is recognized that events with more or less immediate responder action exist and should be studied further in the future.

Specifically, the research investigated the positive and negative outcomes of immediate responder emergence, and the analysis identified patterns and correlations in incident conditions and immediate responder actions. The following questions were developed to guide the examination and provide consistent analysis:

- Did the incident feature immediate responder action that had systemic impacts on scene and beyond?
- Was the incident intentional (antagonistic)?
- Did the immediate responders understand the nature of the incident and potential ongoing threats to their safety?
- Did the event take place in an urban, suburban, or rural area?

- Did immediate responders intervene in the aftermath of the incident? In what ways did they do so?
- What were the positive outcomes of the immediate responder action?
- What were the negative outcomes of the immediate responder action?
- How did the immediate responders demonstrate the concepts of emergence and other sociological constructs?
- Did the response agencies' policies foster the helping behavior provided by immediate responders and allow for management thereof?

Emphasis was placed on analyzing the positive and negative impacts of the immediate responder action seen in the MCI case studies and literature. The current response paradigm and incident management approach was examined to determine its suitability for promoting and managing immediate responder action. Based on these analyses, the thesis provides policy recommendations for creating a helping culture, managing immediate responders, and developing more effective MCI response plans.

D. CHAPTER OVERVIEW

The chapters that follow explore how bystanders become immediate responders at scenes of violent MCIs, and in what ways their action impacts MCI response, including challenges of, and recommendations for, managing bystanders as a resource. Chapter II compares existing planning assumptions to the actual conditions of intentional MCIs, demonstrating the discord between plans and reality. It describes the existing planning assumptions that inform the current response model to MCIs and examines the unique characteristics of the modern MCI, including those incidents brought about intentionally. The chapter describes how bystanders have typically behaved, challenging many of the existing planning assumptions, and examines the exclusion of immediate responders in response plans.

Chapter III explores some of misconceptions about bystanders and helping behavior, which have likely contributed to their underutilization as a resource in emergency

planning. The chapter challenges assumptions of disaster syndrome, panic, and social breakdown. In contrast to these myths, the concept of emergence is introduced as a sociological construct exhibited by immediate responders following an MCI.

Chapter IV examines the impacts of immediate responder behavior following an MCI. The positive outcomes, such as life-saving care and transportation to hospitals, are recounted. Negative outcomes, such as misdirected efforts, poor distribution of patients to hospitals, and failure to notify hospitals in advance, are also explored.

Chapter V examines the current model of command and control used for MCI management. The circumstances and conditions of modern, antagonistic MCIs, including immediate responder action, are shown to be incompatible with this traditional approach. The chapter considers two concepts that may provide a more effective means of managing these complex events: operating at the edge of chaos and leadership through the Cynefin framework.

Chapter VI then considers how to develop the person or team that manages immediate responders at an intentional MCI. It shows that the current Incident Command System (ICS) and National Incident Management System (NIMS) that are routinely used by these commanders are inadequate during these events. The chapter proposes new skills that will allow the incident commander to think through the complex environment and guide resources toward resolution.

Recognizing the benefits of immediate responder action, as well as the need to mitigate unintended consequences, Chapter VII examines how to develop a culture of helping behavior. The chapter uses public cardiopulmonary resuscitation (CPR) outreach and training that has been conducted over the past fifty years as an example of engaging the public. It also describes Good Samaritan laws, which protect immediate responders from litigation. Finally, the chapter discusses the type of training and approach that is necessary to encourage this behavior.

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II. NEW MCIS: CHALLENGING PLANNING ASSUMPTIONS AND TRADITIONAL APPROACHES

The public safety and health care response to MCIs is led by an emergency response plan, which is based upon planning assumptions. These conventional beliefs assert that specific circumstances, conditions, and responses can be expected. Using these supposedly predictable elements, plans guide responders to achieve the desired outcome of a response to an emergency: treating and transporting patients, and regaining control and order. Recent events have shown, however, that these planning assumptions are erroneous and, as a result, lead to suboptimal management and response. Two elements in particular—intentional MCIs and immediate responder action—are not accounted for in the current plans, which make them challenging to manage.

A. TRADITIONAL MCI RESPONSE ASSUMPTIONS

The policies in place today for response and management of a mass casualty incident (MCI) are not much different than original constructs developed several decades ago. They are based on assumptions that victims are isolated and unable to communicate with others outside of the scene, that the events are in geographically remote locations and confined to a single scene, there is no threat of violence, patients are distributed to health care facilities in controlled manner, and emergency medical services are the sole provider for treating and transporting patients.[29] In the United States, most of the MCIs of the past were caused by accidents, such as mass transit crashes, structure failures, weather events, and industrial accidents.[30] Up until the past few decades, civilians were largely spared the intentional MCI.

The tenets of MCI response and management emphasize controlling the event and patients at the scene, then transporting to definitive care. The responsibility for scene

[29] Auf der Heide, "The Importance of Evidence-Based Disaster Planning," 3449.

[30] Wikipedia, s.v. "List of Disasters in the United States by Death Toll," May 16, 2019, https://en.wikipedia.org/w/index.php?title=List_of_disasters_in_the_United_States_by_death_toll&oldid=897364961.

management lies primarily with EMS, with law enforcement and fire/rescue providing ancillary assistance. EMS is to arrive, assess the scene, determine what resources are needed, locate and deploy the resources, triage each patient, provide on-scene care, and then transport patients in a manner that distributes them across health care facilities, all while maintaining incident command.[31] Law enforcement provides scene security, while fire/rescue supplies extra manpower to assist with operations. The incident dynamics are communicated with area hospitals, who are then given the opportunity to plan for arrival of patients already partially treated and managed by EMS professionals. This approach requires that patients remain on scene until EMS evaluates, treats, and transports them; that there be sufficient resources in a timely manner to affect positive treatment for patients; and that the area be of reasonable geographic scope to control it as a single incident. The approach assumes that bystanders and victims cannot or will not take action in response, and professional rescue is necessary to mitigate the incident.

B. NEW MCI CONDITIONS

The world has evolved a great deal since MCI response paradigms were conceptualized. Now most victims can communicate immediately with their cellphones; violence now often causes the MCIs; more MCIs, particularly those caused by violence, tend to happen in densely-populated areas; simultaneous intentional acts of violence can spread resources across a large geographic area; patients self-transport; EMS is often bypassed by patients themselves or empowered immediate responders; and patients are not evenly distributed among hospitals.[32] Many of these changes can be attributed to the causes and nature of recent MCIs.

While the threat of traditional accidents still exists, many MCIs today are caused by acts of violence, such as mass shootings, improvised explosions, mass stabbings, vehicle

[31] Technical Resources, Assistance Center, and Information Exchange, "Mass Casualty Trauma Triage Paradigms and Pitfalls" (report, U.S. Department of Health and Human Services, July 2019), 59.

[32] Auf der Heide, "The Importance of Evidence-Based Disaster Planning," 44.

rammings, and other similar assault tactics.[33] Not only have the methods changed but so too have the impacts. The violent incidents are occurring more frequently and involve far more victims due to the choice and power of weapons.[34] The injury patterns, especially those associated with gunshots and explosives, have become more devastating and far more time-sensitive than conventional traumatic injuries, such as those caused by blunt trauma. Faced with both shocking injuries and the terror of a violent attack itself, while mindful of the propensity for additional attacks, victims are more inclined to leave the area of the attack long before emergency medical services can arrive.[35]

While not codified and, in fact, usually ignored in policies and procedures, patients now self-transport or are transported by other civilians, they no longer rely on EMS to access definitive care, they have means to communicate widely outside of the scene, and they are often treated by immediate responders.[36] These conditions are not accounted for in emergency response plans, and the MCIs usually become more complicated to control, especially while attempting to apply outdated methods.[37] However, these new conditions are providing more patients with faster access to definitive care—presumably saving more lives—and are proving that bystanders can and will respond to emergency events, with or without professional rescue personnel.[38]

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[33] Ronald Simon and Sheldon Teperman, "The World Trade Center Attack: Lessons for Disaster Management," *Critical Care* 5, no. 6 (November 6, 2001): 318, https://doi.org/10.1186/cc1060; Marie Simoneaux, "After Las Vegas Shooting, UMC Gets Advice from Responding Medical Team," nola.com, May 21, 2018, https://www.nola.com/entertainment_life/health_fitness/article_c3eada72-23a1-5752-99fb-519e72489f19.html.

[34] Derek S. Wheeler and W. Bradley Poss, "Mass Casualty Management in a Changing World," *Pediatric Annals; Thorofare* 32, no. 2 (February 2003): 99.

[35] K. Tierney, "Project Summary: Disaster Analysis: Delivery of Emergency Medical Services in Disasters" (summary, Disaster Research Center, 1993), 190.

[36] Auf der Heide, "The Importance of Evidence-Based Disaster Planning," 40.

[37] Federal Emergency Management Agency, *1 October After-Action Report*, 19.

[38] Federal Emergency Management Agency, 19.

C. IMMEDIATE RESPONDER ACTION IN MCIS

Incidents such as the 1995 Tokyo subway sarin attack (over 4,000 nonfatally injured),[39] the World Trade Center attack of 2001 (7,364 nonfatally injured),[40] the 2004 Madrid railway attack (1,180 nonfatally injured),[41] the 2005 subway and bus attacks in London (775 nonfatally injured),[42] and the Las Vegas mass shooting of 2017 (817 nonfatally injured)[43] show just how devastating these events can be and the degree of strain they can immediately place on a health care system that operates at near capacity on a daily basis. In each of these events, immediate responder action played a major role in the response, highlighting the critical role civilians play when the number of patients is too overwhelming for the EMS system. The events also reveal challenges associated with an unregulated response force.

While the magnitude of these recent events, combined with heavy media coverage, magnified the visibility of immediate responder action, helping behavior by immediate responders following disasters is hardly a new occurrence. In 1954, Lewis Killian published several articles in the *Journal of Social Science* in a series entitled "Human Behavior in Disaster: A New Field of Social Research."[44] Within this series, sociologists explored group formation and membership following disasters, including the driving social influences and how those groups impacted society.[45] In the introduction to the series,

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[39] Robyn Pangi, "Consequence Management in the 1995 Sarin Attacks on the Japanese Subway System," *Studies in Conflict & Terrorism* 25, no. 6 (2002): 424. https://doi.org/10.1080/10576100290101296.

[40] Guttenberg, MG, G. Asaeda, A. Cherson et al. "Utilization of Ambulance Resources at the World Trade Center: Implications for Disaster Planning. *Annals of Emergency Medicine* 40, no 92 (2002).

[41] Carresi, Alejandro López. "The 2004 Madrid Train Bombings: An Analysis of Pre-Hospital Management." *Disasters* 32, no. 1 (2008): 52. https://doi.org/10.1111/j.1467-7717.2007.01026.x.

[42] Holgersson, Annelie. "Review of On-Scene Management of Mass-Casualty Attacks." *Journal of Human Security; Melbourne* 12, no. 1 (2016): 92. https://doi.org//10.12924/johs2016.12010091.

[43] Federal Emergency Management Agency, *1 October After-Action Report.* Washington, DC: Federal Emergency Management Agency, 2018: 10. https://emsfellowship.com/wp-content/uploads/2018/09/After-Action-from-Las-Vegas-Shooting.pdf

[44] Lewis M. Killian, *An Introduction to Methodological Problems of Field Studies in Disasters* (Washington, DC: National Research Council, 1956), 8.

[45] Lewis M. Killian, "Some Accomplishments and Some Needs in Disaster Study," *Journal of Social Issues* 10, no. 3 (1954): 66–72, https://doi.org/10.1111/j.1540-4560.1954.tb02000.x.

Dwight Chapman states, “Five years ago, it would have been an exaggeration to describe ‘human behavior under conditions of disaster’ as anything more than an embryonic field of research … we can now say, without hyperbole, that this baby has been born.”[46] Studies soon expanded beyond generalized human behavior and drove toward specific types of behavior, such as the action of bystanders following a disaster.

The convergence of bystanders was heavily studied in the late 1950s by researchers associated with the National Opinion Research Center. Charles Fritz and Eli Marks, who looked at communities that were highly organized because of repeated exposure to disasters, described the behavior as helpful, labeling it as the “therapeutic community.”[47] Later, in 1962, J. Thompson and R.W. Hawkes described the same behavior as the “synthetic community,” noting it was manufactured by the disaster, but also called it the “mass assault,” highlighting the disadvantages of disorganized, widespread convergence.[48] In 1969, Allen Barton emphasized the goodwill that comes of collective stress by titling it “the altruistic community.”[49] James Bentley Taylor, Louis Zurcher, and William Key, using the term “utopian community” in 1970, emphasized that the behavior observed during this time was ideal.[50] In the five decades since that early work, a great deal of research has been conducted to understand bystander behavior following disasters.

Contemporary mass casualty incidents, such as those explored in this thesis, highlight the significant role that immediate responders play in getting victims to safety, providing initial medical care, and transporting them to the hospital. These reactions are not unusual; helping behavior has been widely reported following natural disasters, transit accidents, terrorist attacks, active violence incidents, and fires.

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[46] Killian, *Field Studies in Disasters*.

[47] Charles E. Fritz and Eli S. Marks, “The NORC Studies of Human Behavior in Disaster,” *Journal of Social Issues* 10, no. 3 (1954): 26–41, https://doi.org/10.1111/j.1540-4560.1954.tb01996.x.

[48] J. Thompson and R.W. Hawkes, “Disaster, Community Organization and Administrative Process,” in *Man and Society in Disaster*, eds. George W. Baker and Dwight D. Chapman (New York, NY: Basic Books, 1962), 268–300.

[49] Allen Barton, *Communities in Disaster: A Sociological Analysis of Collective Stress Situations* (Garden City, NY: Doubleday, 1969).

[50] James Bentley Taylor, Louis A. Zurcher, and William H. Key, *Tornado: A Community Responds to Disaster* (Seattle: University of Washington Press, 1970).

Immediate responders play an integral role in MCI response; by evacuating victims and providing immediate life-sustaining care, they provide action during the time-sensitive gap between the incident itself and the arrival of professional rescuers. These immediate responders also help to offset the profound imbalance between victims and rescue resources, a hallmark of MCIs. Immediate responder action is credited with transporting most of the injured to hospitals following major events. Despite the benefits of civilian engagement, immediate responder intervention introduces challenges, such as poor scene control and imbalanced hospital resource allocation.

D. FAILURE TO ACCOUNT FOR IMMEDIATE RESPONDER ACTION IN MCI PLANNING

Though immediate responder action immediately following an MCI has been recognized for decades, MCI response plans do not account for this resource. The Federal Emergency Management Agency (FEMA) document *Operational Templates and Guidance for EMS Mass Incident Deployment*, the guiding document upon which local emergency response agencies are to base their plans and tactics, does not contain the word *bystander*.[51] FEMA's guiding document for medical response to active violence, *Fire/ Emergency Medical Services Department Operational Considerations and Guide for Active Shooter and Mass Casualty Incidents*, mentions bystanders three times: once as a challenge to the scene, once as a possible hostile threat, and once as an obstruction.[52] Of thirty-seven U.S. local and state policies and protocols for EMS response to MCIs reviewed for this thesis, none included provisions for bystanders to serve as medical responders. The disregard for bystanders is further seen in the Emergency Responder, Emergency Medical Technician, and Paramedic training curriculum issued by the National Highway Traffic Safety Administration, the government agency designated to create standardized training

[51] Federal Emergency Management Agency, "Operational Templates and Guidance for EMS Mass Incident Deployment" (guidance document, Department of Homeland Security, June 2012).

[52] U.S. Fire Administration, "Fire/Emergency Medical Services Department Operational Considerations and Guide for Active Shooter and Mass Casualty Incidents" (guidance document, Federal Emergency Management Agency, September 2013).

curriculum for EMS personnel.[53] Neither the *National Emergency Medical Services Education Standards* nor the *Model Uniform Core Criteria for Mass Casualty Incident Triage*, the standards to which every EMS provider in the United States is trained, includes provisions for immediate responder inclusion or management.[54] The training, policies, and procedures continue to presume that EMS will manage the entirety of the MCI response, without any help or intervention from immediate responders.

On January 24, 2019, the U.S. Department of Health and Human Services Office of the Assistant Secretary for Preparedness and Response convened a roundtable to discuss the changing demands of MCIs and how to revise emergency response to best meet these new conditions.[55] The roundtable included recognized experts and visionary thinkers in the fields of emergency medical services, emergency medicine, trauma surgery, emergency management, health care emergency response, and combat medicine. Despite observations about immediate responder action and the results of this behavior, the group came to only "some agreement" on whether hemorrhage control supplies should be provided to immediate responders at MCIs, even if they are trained in these skills, because immediate responders may not be able to apply the skills as proficiently as EMS personnel.[56] The group also reached only "some agreement" on the roles of taxis and ride-sharing components when discussing the fact that the majority of patients from recent MCIs were transported to hospitals without the help of an ambulance.[57] Such alternative transportation means, they discussed, "can result in over-triage of ambulatory patients to trauma centers."[58] There was also only "some agreement" about whether taxi, ride-sharing, and

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[53] National Highway Traffic Safety Administration, "National Emergency Medical Services Education Standards—Emergency Medical Technician Instructional Guidelines" (guidance document, U.S. Department of Transportation, 2009).

[54] National Highway Traffic Safety Administration, "Model Uniform Core Criteria for Mass Casualty Incident Triage: Addendum to the Emergency Medical Technician Instructional Guidelines" (guidance document, U.S. Department of Transportation, 2017).

[55] Technical Resources, Assistance Center, and Information Exchange, "Mass Casualty Trauma Triage Paradigms and Pitfalls."

[56] Technical Resources, Assistance Center, and Information Exchange.

[57] Technical Resources, Assistance Center, and Information Exchange.

[58] Technical Resources, Assistance Center, and Information Exchange.

mass transit drivers should receive layperson medical training, again citing that perhaps these services should not be engaged at all.[59] While recognizing that immediate responders have played an influential role in MCI management, the group did not propose further empowerment or inclusion of immediate responders in the response plan.

[59] Technical Resources, Assistance Center, and Information Exchange.

III. THE SOCIOLOGY OF HELPING BEHAVIOR IN MCIS

Emergency response plans may ignore immediate responders due to misconceptions about how bystanders will perform. The myths suggest that bystanders are either unable or unwilling to help and that the disaster evokes behavior in them that is so undesirable, the behavior itself becomes a hindrance to emergency response. During numerous past experiences, however, bystanders have not behaved this way. Instead, they have been willing and able to assist, becoming an emergent group of helpers that brings about a faster resolution to the incident. The following section explores common misconceptions about bystanders and uses evidence from literature and recent cases to show that they are unfounded.

A. BYSTANDER BEHAVIOR—MYTHS AND MISCONCEPTIONS

With or without policy, bystanders respond in MCIs. There are many myths related to disaster response and human behavior. One of the common misconceptions is that, during disasters, structures break down and chaos ensues. Planners often assume that antisocial and irrational behavior will emerge after a disaster, especially in the immediate aftermath.[60] However, as shown in the vignettes that follow, sense of community, cohesion, and altruism prevail. Existing social structures and constructs remain in place, even as the system and components adapt to new conditions. The people who are affected by the MCI are the first to help themselves; immediate responders therefore offer a quick and effective immediate response.[61] The misconceptions persist nonetheless, which causes emergency response teams to discount immediate responders as a resource. This leads to poor planning and ultimately negatively affects the overall response operation and outcome.

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[60] Russell Dynes, "Community Emergency Planning: False Assumptions and Inappropriate Analogies," *International Journal of Mass Emergencies and Disasters* 12, no. 2 (1994): 141–158.

[61] Dennis Wenger, E.L. Quarantelli, and Russell Dynes, "Disaster Analysis: Emergency Management Offices and Arrangements" (report, Disaster Research Center, February 1987), https://apps.dtic.mil/docs/citations/ADA179024.

It is important to understand the origins of disaster planning and the assumptions on which it is based. Likewise, it is critical to acknowledge the actual human behavior that has been consistently observed during MCIs, as it suggests predictable behavior that will be seen during future events. The vignettes and explanations that follow explore the assumptions and actual behavior for three themes: disaster syndrome, panic, and social breakdown.

1. Disaster Syndrome

Madrid: Mobilized by Mayhem

On March 11, 2004, in Madrid, Spain, a group of terrorists planted thirteen bomb bags across four trains, set to detonate at various train stations.[62] The bombs on three of the trains detonated while the trains were at passenger stations; the bombs on the fourth train, which was behind schedule, exploded along a nearby street.[63] The explosives, rigged with shrapnel, killed 190 people and injured 1,800 more.[64]

Victims immediately reacted. They instantly realized a threat and took action to protect themselves and each other. Those who were able immediately evacuated the four sites, often carrying the injured with them. The victims and immediate responders began to treat the wounded. The survivors banded together to carry patients outside of the station, where private vehicles transported people with serious and minor injuries alike, long before EMS could manage the scene. At Tellez station, people watching from surrounding balconies threw down sheets and blankets to assist, while others assisted emergency personnel in transitioning a nearby sports pavilion into a treatment area.[65] Due to insufficient EMS resources at the nearby El Pozo station, civilians assumed responsibility

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62 "Spain Train Bombings Fast Facts," CNN, February 26, 2020, https://www.cnn.com/2013/11/04/world/europe/spain-train-bombings-fast-facts/index.html.

63 "Scores Die in Madrid Bomb Carnage," BBC, March 11, 2004, http://news.bbc.co.uk/2/hi/europe/3500452.stm.

64 "The 3/11 Madrid Bombings: An Assessment after 5 Years," Wilson Center, April 6, 2009, https://www.wilsoncenter.org/event/the-311-madrid-bombings-assessment-after-5-years.

65 López Carresi, "The 2004 Madrid Train Bombings."

for both treatment and transport.[66] Those involved made an immediate transition from victim to responder.

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Time after time, during actual disasters, immediate responders do intervene, and are rarely deterred from doing so. However, much of the early research about bystander intervention was conducted in laboratories rather than through case studies. In these lab simulations, which observed a single person in need, bystander action was relatively low and could be manipulated by several factors.[67] Those studies have likely contributed to the belief that bystanders will not or cannot act during an MCI. Much of the early literature searched for reasons to explain the lack of bystander intervention.[68] One reason, suggested researchers, was the idea of *disaster shock*, which is more commonly known as *disaster syndrome*.[69]

Disaster syndrome is the stunned incapacitation that some victims feel after a disaster. This psychological condition leaves victims in a sort of shock during which they are unable to help themselves or others. The theory explains that victims and bystanders who suffer this syndrome will need help from an outside entity, such as an emergency response agency.[70] Disaster syndrome has been touted as one of the critical roles of, and reasons behind, the command-and-control system that emergency services have adopted for MCI response. Dennis Wenger, E. L. Quarantelli, and Russell Dynes came together to refute disaster syndrome and Erik Auf der Heide presented additional evidence against its

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66 J. Peral Gutierrez de Ceballos et al., "11 March 2004: The Terrorist Bomb Explosions in Madrid, Spain—An Analysis of the Logistics, Injuries Sustained and Clinical Management of Casualties Treated at the Closest Hospital," *Critical Care* 9, no. 1 (November 3, 2004): 104, https://doi.org/10.1186/cc2995.

67 Latane and Darley, "Group Inhibition."

68 Latane and Darley, "Bystander 'Apathy.'"

69 Margaret O'Leary, *The First 72 Hours: A Community Approach to Disaster Preparedness* (Bloomington, IN: iUniverse, 2004), 72.

70 E.L. Quarantelli and Russell R. Dynes, "Editors' Introduction," *The American Behavioral Scientist* 13, no. 3 (January 1, 1970): 325–30.

legitimacy.[71] Hugh Stephens later supported their work, showing that victims and bystanders at the Texas City explosions and fires of 1947 were not incapacitated but rather helped themselves long before traditional emergency services could arrive.[72]

As seen in the examples throughout this thesis, neither victims nor bystanders become immobilized by even the most catastrophic events.[73] They also do not passively await treatment by designated emergency response agencies.[74] Instead, they show a great deal of self-initiative, which often leads to group initiative.[75] Immediate responders take control of their fate and move toward resolution. As they do so, they maintain their routine morals and sense of community, coming to the aid of victims who cannot help themselves.

Many emergency response plans consider that disaster syndrome will befall many victims and bystanders. Based on this assumption, one role of the response organizations is to provide paternalistic reassurance that will help victims out of this daze. In reality, only a small portion of victims have reported feeling dazed after a violent event—and they were able to resolve it on their own almost immediately.[76] Immediate responders and victims alike actively provide treatment and transport for themselves and others. As people often act under normal circumstances, emergency services are reserved as a last resort, only if the victims cannot otherwise take care of themselves.[77]

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[71] Wenger, Quarantelli, and Dynes, "Disaster Analysis"; Auf der Heide, "The Importance of Evidence-Based Disaster Planning."

[72] Hugh W. Stephens, "The Texas City Disaster: A Re-examination," *Organization & Environment* 7, no. 3 (1993), https://journals.sagepub.com/doi/abs/10.1177/108602669300700303.

[73] Enrico L. Quarantelli, "Organizational Behavior in Disasters and Implications for Disaster Planning" (monograph, Federal Emergency Management Agency, 1986), https://www.hsdl.org/?abstract&did=745403.

[74] Quarantelli.

[75] Quarantelli.

[76] O'Leary, *The First 72 Hours*.

[77] Quarantelli, "Organizational Behavior in Disasters."

2. Panic

Las Vegas: Rapid Fire to Rapid Action

Over 22,000 people were enjoying the live music, warm weather, and good company at the Route 91 Harvest Festival in Las Vegas on October 1, 2017. They had traveled from all over the country to attend the multiday music festival staged in the outdoor Las Vegas Village. Across the street, and nearly four hundred feet above, Stephen Paddock, a sixty-four-year-old retired real estate businessman, broke the window of room 32-135 at the Mandalay Bay Resort and Casino, where he had been staying for the past six nights. About twenty-five minutes into Jason Aldean's performance on the mainstage, at 10:05 PM, Paddock chose one of the twenty-three firearms he had amassed in his hotel room, took precise aim at the crowd, and opened fire on the unsuspecting concertgoers. Over the next ten minutes, Paddock's weapons rained down devastating, high-power rounds, killing fifty-two and injuring more than eight hundred others.

Immediately following the event, rational behavior prevailed. Most in the crowd did not immediately recognize the threat. They noticed the band flee the stage, and some were confused as people around them dropped to the ground, splattering them with blood. As the band was silenced, the sound of rapid fire became clear. Most sought cover in the open venue; others sprang into action. Immediate responders and patients alike took charge of their wellbeing and sought transportation. Off-duty police officers and medical responders provided their own personal tourniquets to victims and loaded them into privately owned vehicles.[78] Uninjured concertgoers removed their belts and shirts to create improvised tourniquets and dressings.[79] Immediate responders dragged patients and used tarps to create stretchers to get patients to safety.

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Contrary to disaster syndrome—the idea that bystanders become immobilized by an MCI—there is a popular belief that panic overcomes victims and bystanders of

[78] Federal Emergency Management Agency, *1 October After-Action Report*, 12.

[79] Federal Emergency Management Agency.

disasters.[80] The belief, fueled by movies and media, is that people become hysterical and lose control, leading to a state of personal and group chaos.[81] It is suggested that any type of physical destruction will be accompanied by psychological and social destruction.[82] Because this behavior is rampant, it is held, civilians cannot be trusted to react reasonably and responsibly following a disaster and, as such, require heavy government involvement to control the situation and care for the victims.

The definition of panic varies slightly depending on the source. The consistent themes in definitions include:

- Sudden, overpowering fright
- Unreasoning terror causing mass flight
- Irrational and hysterical behavior
- Lack of self-control
- Frantic actions
- Unreasonable, irrational thought and action

Other sources claim that panic causes an individual to lose concern for others.[83] During this time, according to those sources, civilization erodes.[84] It is thought that victims become competitive and selfish in their pursuit of self-preservation. The theory explains that the panic and chaos can be more dangerous than the triggering event, causing pandemonium and stampedes of people during the frenzied escape.[85] This is why the public has been told not to yell "fire!" in a crowded movie theater: the ensuing panic would

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[80] Quarantelli and Dynes, "Editors' Introduction."

[81] Quarantelli and Dynes.

[82] Quarantelli, "Organizational Behavior in Disasters."

[83] Quarantelli and Dynes, "Editors' Introduction."

[84] Quarantelli and Dynes.

[85] Quarantelli, "Organizational Behavior in Disasters."

cause more harm than the fire itself. It is argued that this irrational, uncontrollable behavior requires intervention from professional rescuers, who can restore the personal and societal norms that will allow for response and recovery. This has become a major driving factor for a command-and-control approach by public safety when responding to MCIs.

Despite the persistence of this image of post-disaster reactions, panic rarely occurs. While the word is often used by witnesses and responders alike, the behavior they describe does not align with the characteristics associated with the word panic. The behavior that they describe is rational action driven by fear and threat, such as quickly evacuating. In this sense, the word panic has been used to describe any behavior that is sudden—or rushed—and that results from fear.[86] The actions of survivors and immediate responders, though sparked by fear and novelty, are controlled, deliberate, and reasonable responses to a threat. The victims and immediate responders exhibit rationality as they show more self- and small-group initiative than they do in normal circumstances.[87] Instead of panicking, the individuals and the collective group act in an orderly fashion as they carry out mission-driven actions, such as moving to safety, evacuating others, and treating the injured. While it may not be coordinated and orchestrated by a single command authority, it is purposeful, deliberate action. Running scared from an active shooter or a bomb site is not panic; it is perhaps the most logical, self-preserving, healthy reaction one could hope to have in that scenario. The victim and immediate responder intuition to immediately flee is a survival mechanism that works, not a byproduct of hysteria.

In fact, it has been shown that people, just like society, tend to continue to function in the same manner that they would under normal circumstances during an emergency. Rather than changing dramatically in the face of emergency, the individual's first and perhaps easiest reaction is one of trying to maintain status quo. Those who are prone to anxiety in routine life will likely react with anxiety when stressed. Similarly, those who are inclined to help others, or have a usual sense of calm when stressed, exhibit that same

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86 Thomas E. Drabek, *Human System Responses to Disaster: An Inventory of Sociological Findings* (Berlin/Heidelberg, Germany: Springer Science & Business Media, 2012).

87 Quarantelli, "Organizational Behavior in Disasters."

general behavior as the default reaction to an emergency. The people who do panic, in the strictest sense of the word, are a minority of the population, and the panic is short-lived and does not impact others or the trajectory of the event. In a study of more than five hundred disasters, the Disaster Research Center at the University of Delaware found that panic was "of very little practical or operational importance," and "is something that can almost be ignored in disaster planning and managing, except for the keeping in mind that it is a myth and not something to be assumed."[88]

Despite the evidence presented in after-action reviews and sociological studies over the past several decades, the concept of panic continues to manifest in disaster planning assumptions. It is unclear why this belief persists, apparently immune to observations of MCIs. It is so pervasive that even when rescuers have witnessed calm, rational, helpful behavior during disasters to which they have responded, they have dismissed such behavior as anomalous, attributing individual calm and social cohesion to the unique circumstances of that specific event, or the resilient spirit of the particular population impacted.[89]

Perhaps semantics drive the confusion, as the word panic is often used to describe any sudden behavior driven by fear. For example, a rescuer at the Murrah Building bombing reported: "Absolute panic was rampant in the building during the first hour to hour and a half. The building had so many access points that it was difficult to keep anyone from entering."[90] What the rescuer is describing is not panic but a rational reaction of the community to enter the building to help survivors. The responder used words that suggest an undesirable response by immediate responders when, in fact, the behavior he was describing was a noble response to help those in need. This is not indicative of the selfish and competitive behavior that has been associated with panic.[91]

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88 E.L. Quarantelli, "How Individuals and Groups React During Disasters: Planning and Managing Implications for EMS Delivery" (preliminary paper, Disaster Research Center, 1989), http://udspace.udel.edu/handle/19716/510.

89 O'Leary, *The First 72 Hours*.

90 City of Oklahoma City, *Alfred P. Murrah Federal Building Bombing April 19. 1995: Final Report* (Stillwater, OK: Fire Protection Publications, 1996), http://www.murderpedia.org/male.M/images/m/mcveigh/docs/okcfr_TOC.pdf.

91 Quarantelli, "How Individuals and Groups React During Disasters."

Others have suggested that it is self- or institutional interest that drives people to associate panic with the response of bystanders. Following 9/11, Kathleen Tierney noted a resurgence of the panic narrative.[92] She suggests that those agencies that report a fragile and unreliable public in the face of disaster have an interest in exerting more control, or expanding their organization, for more influence over, or more involvement in, homeland security. The institutions assert that strict lines of command and control are necessary to maintain civil society and provide optimal rescue.[93] Indeed, the National Incident Management System (NIMS) was developed in response to a mandate from the president of the United States through the Department of Homeland Security (DHS) in the aftermath of 9/11. The hierarchical structure, a major initiative for the nascent DHS to influence local and state emergency operations, consists of a bureaucracy that does not allow for improvisation such as immediate responder action. Even with such structures and the growing influence of such agencies, immediate responders continue to respond to incidents in a rational and helpful manner.

The panicky bystander narrative is exacerbated by the media. Henry Fischer's 1998 book, *Response to Disaster: Fact versus Fiction and its Perpetuation*, explores the reasons why such stereotypes continue to promulgate despite repeated case studies that prove otherwise, citing movies, television, media, and bystander accounts as the source of misinformation.[94] Movies portray disasters in a dramatic light for obvious reasons. Media outlets tend to sensationalize events, choosing dramatic footage or an impactful personal quote, regardless of whether or not it is representative of the overall response.[95]

Lee Clarke's 2002 work also blames the media for the persistence of the image of bystander panic in the aftermath of a disaster, providing salient examples where calm and

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[92] Kathleen Tierney, "Disaster Beliefs and Institutional Interests: Recycling Disaster Myths in the Aftermath of 9-11," in *Terrorism and Disaster: New Threats, New Ideas*, ed. Lee Clarke, vol. 11 (Bingley, UK: Emerald Group Publishing, 2003), 33–51, https://doi.org/10.1016/S0196-1152(03)11004-6.

[93] Tierney.

[94] Henry W. Fischer, *Response to Disaster: Fact versus Fiction and its Perpetuation: The Sociology of Disaster* (Lanham, MD: University Press of America, 1998).

[95] Lee Clarke, *Panic: Myth or Reality?* (Emmitsburg, MD: National Emergency Training Center, 2002).

rational, albeit rushed, action was observed.[96] Clarke points to the media portrayal of 9/11, much of which showed civilians running down streets to escape the collapsing towers.[97] The actions represented a rational reaction to an immediate threat: expedient evacuation. But the actions were viewed as chaotic and hysterical and, therefore, must have been representative of panic. In reality, almost everyone who was below the point of impact at the World Trade Center buildings survived.[98] The fact that such a high proportion of survival was even possible shows that people did not panic but rather created and executed an orderly and effective evacuation plan.[99]

The panicked survivor and bystander narrative continues to reverberate from the public, government officials, response entities, witnesses, and even survivors themselves. But disaster sociologists have come to realize that panic is rare and, when it does happen, it affects only a small portion of survivors and bystanders and has minimal impact on the outcome of the event. Enrico Quarantelli, the cofounder of the Disaster Research Center and a renowned leader in disaster behavior research, said in 2002:

> I no longer believe the term "panic" should be treated as a social science concept. It is a label taken from popular discourse. During the whole history of [our] research involving nearly 700 different studies, I would be hard pressed to cite … but a very few marginal instances of anything that could be called panic behavior.[100]

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96 Clarke.

97 John Avlon, "9/11 Remembered: 'A Gray Cloud of Debris Rolled Violently toward Us...'" CNN, September 11, 2018, https://www.cnn.com/2018/09/10/opinions/9-11-avlon/index.html.

98 National Commission on Terrorist Attacks Upon the United States, *The 9/11 Commission Report* (New York, NY: W.W. Norton, 2004), 585.

99 National Commission on Terrorist Attacks Upon the United States, 11.

100 Clarke, *Panic*.

3. Social Breakdown

Order in Orlando

Pulse, a gay nightclub in Orlando, Florida, hosted its popular weekly Latin Night on June 12, 2016.[101] About 320 people were in the club as last call neared at 2:00 AM. At about that time, Omar Mateen, a twenty-nine-year-old security guard who claimed to be acting in the name of the Islamic State of Iraq and the Levant (ISIL), parked his rental van in a neighboring parking lot.[102] Mateen, wearing a plaid shirt and cargo pants and carrying a Sig Saur MCS semiautomatic rifle and a 9mm Glock 17 semiautomatic pistol, casually walked into the club, bypassing security.[103] At 2:02 AM, just after entering, Mateen began indiscriminately shooting anyone he came across as he walked through the club.[104] Mateen paused only long enough to make a 911 call to explain his motive as retaliation against U.S. involvement in Iraq and Syria.[105] He fired hundreds of rounds before barricading himself in a bathroom, taking patrons as hostages.[106] Before the event was over, Mateen killed forty-nine people and injured fifty-eight more.[107]

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101 Steve Rothaus, "Orlando Shooting: Employees, Patrons at Pulse Gay Club 'Like a Family,'" *Miami Herald*, June 12, 2016, https://www.miamiherald.com/news/local/community/gay-south-florida/article83301677.html.

102 National Police Foundation, "After-Action Review of the Orlando Fire Department Response to the Attack at Pulse Nightclub" (report, National Police Foundation, October 2018).

103 Jim Zarroli, "The Orlando Killer's Weapon Of Choice Was 'The Ultimate Hunting Rifle,'" NPR, June 13, 2016, https://www.npr.org/sections/thetwo-way/2016/06/13/481877159/the-rifle-used-in-orlando-is-lightweight-easy-to-use-and-oh-so-deadly.

104 "A Timeline of What Happened at the Orlando Nightclub Shooting," *Tampa Bay Times*, June 13, 2016, https://tampabay.com/news/publicsafety/crime/a-timeline-of-what-happened-at-the-orlando-nightclub-shooting/2281363/.

105 Hayley Tsukayama, Mark Berman, and Jerry Markon, "Gunman Who Killed 49 in Orlando Nightclub Had Pledged Allegiance to ISIS," *Washington Post*, June 12, 2016, https://www.washingtonpost.com/news/post-nation/wp/2016/06/12/orlando-nightclub-shooting-about-20-dead-in-domestic-terror-incident-at-gay-club/.

106 WFTV-Orlando, "Law Enforcement Source: 202 Rounds Fired during Pulse Nightclub Shooting in Orlando," WSOCTV, June 14, 2016, https://www.wsoctv.com/news/trending-now/law-enforcement-source-202-rounds-fired-during-pulse-nightclub-shooting-in-orlando/340948566/.

107 Christal Hayes et al., "New Pulse Review from Orlando Police Reveals Details, Lessons Learned," *Orlando Sentinel*, April 13, 2017, https://www.orlandosentinel.com/news/pulse-orlando-nightclub-shooting/os-pulse-presentation-orlando-police-20170412-story.html.

At the event, social order and compassion abounded. During the shooting, patrons immediately tried to flee and heroic immediate responders emerged. A bouncer at the club jumped over a locked door where many patrons were trapped, then released a second door, allowing all seventy people inside to safely escape.[108] People shielded one another, including a man who covered survivor Patience Carter, just before he himself was shot and killed by Marteen.[109] Jean Carlos Mendez Perez made it outside to safety, but returned to rescue Luis Daniel Wilson-Leon.[110] Both were found shot and killed in the entranceway.[111] A 911 call made by an unidentified patron barricaded in the bathroom reveals the caller comforting other hostages, trying to calm the scene and assuage their fears. The 911 operator asked the caller if he knew the people, to which he responded, "No, but I'm learning as I go. I don't know people's names but I do know faces I will never forget as long as I live."[112] The caller, continuing to care for the group with which he had bonded, helped evacuate the survivors from the bathroom once the wall was breached by police over three hours later.[113]

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A natural extension of individual panic or incapacitation is the idea that, as individual behavior aggregates during an MCI, the norms of society will collapse. The theory asserts that as people become more self-absorbed and competitive, social disorder will rise, destroying the basic tenets of community. Helping behavior dissipates, antisocial

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[108] Jeff Schogol, "Marine Vet's Quick Actions Saved Dozens of Lives during Orlando Nightclub Shooting," *Marine Corps Times*, August 7, 2017, https://www.marinecorpstimes.com/news/your-marine-corps/2016/06/14/marine-vet-s-quick-actions-saved-dozens-of-lives-during-orlando-nightclub-shooting/.

[109] Gillian Mohney, "Hostage Injured at Orlando Nightclub Recounts Hours of Pain and Fear With Gunman," Good Morning America, June 14, 2016, https://gma.yahoo.com/hostage-injured-orlando-nightclub-recounts-hours-pain-fear-000135444--abc-news-topstories.html.

[110] Abe Aboraya, "Orlando Paramedics Didn't Go in to Save Victims of the Pulse Shooting. Here's Why," ProPublica, September 2, 2018, https://www.propublica.org/article/pulse-shooting-orlando-tragedy-response-plan.

[111] Aboraya.

[112] "Pulse Patron Tried Calming Others during Massacre New 911 Calls Reveal," CBS, November 15, 2016, https://www.cbsnews.com/news/pulse-patron-tried-calming-others-during-massacre-new-911-calls-reveal/.

[113] *Tampa Bay Times*, "A Timeline of the Orlando Nightclub Shooting."

behavior rises, and chaos ensues, according to this line of reasoning. In the interest of self-preservation, people become hostile and aggressive toward others, it is presumed.[114] Therefore, the role of emergency services, in large part, is to maintain order and protect civil society.

Quarantelli first challenged the notions of panic, looting, and antisocial behavior in 1986.[115] He provided examples when people did not panic, looting was rare, and antisocial behavior was virtually nonexistent.[116] These findings, particularly against panic and looting, were supported by Auf der Heide in 1989.[117] Norris Johnson, in 1987, showed that the portrayal of social breakdown and chaos following a disaster was inaccurate in nearly all cases, with any antisocial behavior being short-lived and of little impact.[118]

The case studies in this thesis show that disasters do not tear apart communities or threaten social order. Instead, after processing and understanding the danger, immediate responders show adaptive positive behavior, adjusting to protect family, friends, strangers, and themselves. The response period is flooded with this altruistic behavior. On their own accord, immediate responders initiate care and transport of victims. In fact, the common threat has a unifying effect on the group of survivors.[119] Group unity and social ties are strengthened as individuals unite to care for the injured. Rather than a collapse in social norms, disasters elicit more prosocial behavior than do routine circumstances.[120]

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114 Quarantelli and Dynes, "Editors' Introduction."

115 E. L. Quarantelli, "Research Findings on Organizational Behavior in Disasters and Their Applicability in Developing Countries" (preliminary paper, Disaster Research Center, 1986), http://udspace.udel.edu/handle/19716/481.

116 Quarantelli.

117 Erik Auf der Heide, *Disaster Response: Principles of Preparation and Coordination* (St. Louis, MO: Mosby, 1989).

118 Norris R. Johnson, "Panic and the Breakdown of Social Order: Popular Myth, Social Theory, Empirical Evidence," *Sociological Focus* 20, no. 3 (August 1, 1987): 171–83, https://doi.org/10.1080/00380237.1987.10570950.

119 Amanda Ripley, *The Unthinkable: Who Survives When Disaster Strikes—And Why*, Kindle ed. (New York, NY: Harmony, 2008).

120 Kathleen J. Tierney, "Facing the Unexpected: Disaster Preparedness and Response in the United States," *Disaster Prevention and Management: An International Journal* 11, no. 3 (2002): 222, https://doi.org/10.1108/dpm.2002.11.3.222.1.

At the Murrah Building, hundreds of people converged on the scene immediately after the blast, forcing themselves into the building to help the injured. In Madrid, immediate responders continued to help survivors even after they realized that unexploded bombs still threatened the scene. Crowds joined forces to break down the barrier that separated injured spectators from EMS personnel during the Boston Marathon bombings. In Orlando, victims died while shielding others; some who escaped were ultimately killed when they returned into the building to help someone. In Las Vegas, rideshare drivers reported to the scene of the incident to offer their services. In each event, there were countless examples of strengthening—rather than degradation—of society.

On September 11, 2001, an orderly evacuation was reported in all stairwells of the World Trade Center towers, which contributed heavily to the successful evacuation of approximately 95 percent of those in the towers who were below the impact floors. This effort clearly minimized the fatalities caused by the collapse of the structures.[121] Much of this is owed to civilians like Rick Rescorla, head of security for Morgan Stanley, who led the evacuation of 2,687 people from Tower 2.[122] He was killed when the towers collapsed, as he continued to work in the stairwell to guide tenants to safety.[123] Elsewhere, groups joined together to carry disabled occupants down dozens of flights of stairs after the elevators were rendered useless. After the towers fell, among the one million pounds of rubble, acrid smoke, and dense dust, thousands of victims needed assistance. With a public safety system stunned by the enormity of the collapse, coupled with the instant loss of hundreds of firefighters, emergency medical providers, and police officers, civilians were forced to help themselves and each other.[124] Photos and videos of the day show hundreds of images of people helping one another, tending to wounds or carrying someone to safety.

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[121] National Commission on Terrorist Attacks Upon the United States, *9/11 Commission Report*.

[122] Richard Sisk, "The Story of Rick Rescorla, Vietnam Vet and 9/11 Hero," Military.com, September 13, 2019, https://www.military.com/daily-news/2019/09/13/story-rick-rescorla-vietnam-vet-and-9-11-hero.html.

[123] Sisk.

[124] Avlon, "9/11 Remembered."

When a catastrophic disaster such as an intentional MCI strikes an area, the community rises to the occasion; the worst conditions bring out the best behaviors. Disaster researcher Neil Britton explains that "disasters reveal both elemental social processes of the social order and are explained by them."[125] This is because humans default to their normative morals and routines when stressed by a disaster.[126] In fact, the magnitude of the event quickly diminishes outside influences and considerations, allowing people to be even more prosocial during disaster response. Unencumbered by the other normal competing priorities—appointments, work, family, friends, social standing, and other aspects of social life—victims and immediate responders devote themselves in their entirety to the response following an MCI.

An example of societal order and cohesion following disaster is the Beverly Hills Supper Club fire that occurred on May 28, 1977. On a Saturday night over Memorial Day weekend, 3,000 people packed the club when a fire broke out in the Zebra Room. Once noticing the fire, the club employees maintained their pre-disaster role of serving the customers. The staff calmly announced the fire, explained exit routes, guided patrons down stairways, and crawled through smoke to reach those that became lost or incapacitated.[127] The victims were eager to be led and the staff eager to lead, just as they would be under normal circumstances. Patrons were orderly and respected the directions of staff. They remained calm, some even ordering cocktails to go before exiting.[128] Two thirds of the young employees reported helping patrons, expressing that they felt responsible for tending to the customers, continuing their routine social expectations and structures. It is remarkable that more than half of the employees were less than 25 years old, with nearly a third being less than 21 years old.[129] The young waitresses, busboys, and bartenders would save all but 167 of the nearly 3,000 patrons that night. Though it remains one of the

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[125] Neil Britton, "Organized Behavior in Disaster: A Review Essay," *International Journal of Mass Emergencies and Disasters* 6, no. 3 (1988): 363–95.

[126] Britton.

[127] Johnson, "Panic and the Breakdown of Social Order."

[128] Ripley, *The Unthinkable*.

[129] Johnson, "Panic and the Breakdown of Social Order."

deadliest fires in U.S. history, it would have been more so if the staff and patrons of the club deviated from their normal roles and relationships, or if disorder emerged.

The studies over several decades show that social disorder following a disaster simply does not happen. The literature and case reviews offer no evidence of this phenomenon. Instead, in a sea of disruption, the calm and orderly actions of the group stand out. Community bonds are strengthened, and altruism prevails. As such, the assumption that emergency services will be needed to restore and maintain order is unfounded. Emergency response entities should leverage immediate responders and exploit the stronger sense of community to best accomplish the overwhelming task of caring for the injured following an intentional MCI.

B. EMERGENCE

World Trade Center: Lifesaving Teams

At and around the World Trade Center on September 11, 2001, impromptu groups of people formed that would save many lives. Survivors of the attack and the subsequent collapse of the towers ran south to the water, where they were met by more than one hundred boats—ferries, tugboats, fishing boats, Coast Guard patrols, tour boats, and dinner cruise vessels—that had responded instinctively to evacuate them.[130] In what would become the largest maritime evacuation in U.S. history, the team of boats evacuated more than 500,000 people to safety that day.[131]

Frank De Martini, Pablo Ortiz, Pete Negron, and Carolos da Costa, all employees of the Port Authority of New York construction division, were on the eighty-eighth floor of the North Tower when the plane struck.[132] Through dust, smoke, flames, and heat, the men cleared entrances to stairways, directed people to safety, freed those trapped in

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[130] Sara Kettler, "Real-Life Heroes of September 11, 2001," Biography, accessed April 21, 2020, https://www.biography.com/news/september-11-2001-real-life-heroes.

[131] Jay Moon, "9/11 Boatlift: The Largest Marine Evacuation in History," INSH, August 1, 2019, https://insh.world/history/the-great-boat-lift-of-911/.

[132] Jim Dwyer, "The Port Authority Tapes: Overview; Fresh Glimpse in 9/11 Files of the Struggles for Survival," *New York Times*, August 29, 2003, https://www.nytimes.com/2003/08/29/nyregion/port-authority-tapes-overview-fresh-glimpse-9-11-files-struggles-for-survival.html.

elevators, and broke through drywall to free others.[133] All four died when the building collapsed, but not before saving more than fifty lives.[134]

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Empowered immediate responders who act in response to an MCI become an emergent organization, which, in the context of MCIs, is an informal group of private citizens who work together to achieve common goals to mitigate the disaster. In the MCIs explored in this thesis, common goals include evacuation, patient care, and transportation of victims to hospitals. The emergent group has the response advantages of proximity, speed, efficiency, accountability, and empowerment to help victims.[135] Situational factors—such as being on scene when the event occurred, feeling a sense of community with victims, possessing basic first aid knowledge, and understanding the direct impact of their actions—drive bystanders to emerge as immediate responders.[136] This phenomenon occurred in every event studied within this thesis. Beyond those specific examples, immediate responder emergence is common following all types of disasters.

The Disaster Research Center, which was established at Ohio State University in 1963, initially sought to identify organizational behavior in stressful situations, such as in a military branch or office, rather than as it relates to individual or group actions.[137] Through the initial research, however, it became clear that individual stress and organizational stress are inextricably linked. Russell Dynes, one of the founding members of the Disaster Research Center, studied collective stress and bystander behavior following

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[133] Kettler, "Real-Life Heroes of September 11, 2001."

[134] Jena McGregor, "Remembering Some of 9/11's Great Leaders," *Washington Post*, September 11, 2013, https://www.washingtonpost.com/news/on-leadership/wp/2013/09/11/remembering-some-of-911s-great-leaders/.

[135] John Twigg and Irina Mosel, "Emergent Groups and Spontaneous Volunteers in Urban Disaster Response," *Environment and Urbanization* 29, no. 2 (October 1, 2017): 443–58, https://doi.org/10.1177/0956247817721413.

[136] E.L. Quarantelli, Verta A. Taylor, and Kathleen J. Tierney, "Delivery of Emergency Medical Services in Disasters" (preliminary paper, Disaster Research Center, 1977), 11.

[137] Enrico Quarantelli, "The Early History of the Disaster Research Center," Disaster Research Center, accessed August 7, 2020, 5, https://www.drc.udel.edu/content-sub-site/Documents/DRC%20Early%20History.pdf.

disasters.[138] In 1970, Arnold Parr was the first to identify immediate responder and victim behavior as "emergence," referring to the chemical, biological, and systems theory of a group having properties and behaviors that the individuals in the group do not have on their own.[139] By 1978, J. W. Bardo expanded this discussion, citing common characteristics of emergent behavior such as a lack of formal leadership, transient membership, instinctive understanding of roles, and shared purpose.[140] Quarantelli, another founder of the Disaster Research Center, explained how emergent behavior can impact existing organizations and operations, such as public safety.[141]

Dynes and Quarantelli continued to examine real-world events to apply the emergence framework and further define the actions of groups of collective bystanders.[142] They began to establish that the groups are cohesive, and that the bonds of community strengthen as a result of a disaster. They also showed how these emergent organizations interacted functionally.[143] Numerous other researchers tested their hypotheses over the next two decades and supported the findings of Dynes and Quarantelli.[144]

Researchers continued to explore the emergent phenomenon among bystanders, including the motivations behind immediate responder emergence and the structures that form as a result. Auf der Heide explains that these groups surface if demand exceeds available resources.[145] Similarly, Richard Stallings and Quarantelli explain that when existing structures are insufficient, such as an emergency response system that is not

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[138] Russell Rowe Dynes, *Organized Behavior in Disaster: Analysis and Conceptualization* (Columbus, OH: Disaster Research Center, 1969).

[139] Arnold R. Parr, "Organizational Response to Community Crises and Group Emergence," *American Behavioral Scientist* 13, no. 3 (1970), https://journals.sagepub.com/doi/abs/10.1177/000276427001300312?journalCode=absb.

[140] J.W. Bardo, "Organizational Response to Disaster—Typology of Adaptation and Change," *Mass Emergencies* 3, no. 2–3 (1978): 87–104.

[141] Quarantelli, "Organizational Behavior in Disasters."

[142] Dynes, *Organized Behavior in Disaster*.

[143] Quarantelli, "How Individuals and Groups React during Disasters," 38.

[144] Robert A. Stallings and E. L. Quarantelli, "Emergent Citizen Groups and Emergency Management," *Public Administration Review* 45 (1985): 93–100, https://doi.org/10.2307/3135003.

[145] Erik Auf der Heide, "Convergence Behavior in Disasters," *Annals of Emergency Medicine* 41, no. 4 (April 1, 2003): 463–66, https://doi.org/10.1067/mem.2003.126.

primed for disaster response, emergent groups will form.[146] Dennis Wenger explains the same finding, but frames it in the context of community ownership: a society assertively handles the event if it feels no one else will.[147] Charles Scawthorn and Wenger show how poor planning for emergent behavior exacerbates the impacts.[148]

Dennis Milteti, Thomas Drabek, and John Hass first separated types of emergence according to the phase of the disaster in 1975.[149] This work is important because it shows how the groups perform and interact differently depending on how much time has elapsed since the disaster began; for instance, the behavior is less organized and more difficult to coordinate in the immediate aftermath of an incident.[150] Stallings and Quarantelli explored the specific relations that foster the new tasks.[151] In 1981, Peter Munch and Charles Marske argued that action and order are separate, and a clear structure is therefore not required for the emergent group of immediate responders to be effective.[152] In 1987, Quarantelli applied complexity theory to disaster sociology and emergent groups, creating new categories based on task and group composition.[153] Sandra Bloom further explored emergence among complexity, showing that patterned behavior does represent some form of organization.[154]

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146 Stallings and Quarantelli, "Emergent Citizen Groups."

147 Dennis E. Wenger, *Emergent and Volunteer Behavior during Disaster: Research Findings and Planning Implications* (College Station: Texas A&M University Hazard Reduction & Recovery Center, 1992).

148 Charles R. Scawthorn and Dennis E. Wenger, *Emergency Response, Planning and Search and Rescue* (College Station: Texas A&M University Hazard Reduction & Recovery Center, 1990).

149 Dennis S. Mileti, Thomas E. Drabek, and John Eugene Haas, *Human Systems in Extreme Environments: A Sociological Perspective*, vol. 21 (Boulder: Institute of Behavioral Science, University of Colorado, 1975).

150 E.L. Quarantelli and R.R. Dynes, "Response to Social Crisis and Disaster," *Annual Review of Sociology* 3, no. 1 (August 1977): 23–49, https://doi.org/10.1146/annurev.so.03.080177.000323.

151 Stallings and Quarantelli, "Emergent Citizen Groups."

152 Peter A. Munch and Charles E. Marske, "Atomism and Social Integration," *Journal of Anthropology Research* 37 (1981): 158–71, http://www.peacefulsocieties.org/Archtext/Munch81.pdf.

153 E. Quarantelli, "Disaster Studies: An Analysis of the Social Historical Factors Affecting the Development of Research in the Area," *International Journal of Mass Emergencies and Disasters* 5, no. 3 (1987): 285–310.

154 Sandra L. Bloom, "Chaos, Complexity, Self-Organization," *Psychotherapy Review* 2 (January 2000): 5.

There are multiple types of emergent phenomena. Active immediate responders fall into the category of group emergence, which is when a new group forms with new tasks and structures. A group of bystanders, which has never existed as a formal structure, will notice a problem that cannot be met by traditional structures, such as emergency medical services, either because of the delayed mobilization or sheer number of injured. The emergent group spontaneously volunteers and takes on evacuating, treating, and transporting the injured.[155] While the group members may have been co-located prior to the event—at a concert or a marathon, for example—they are now united under a new premise and collective activity, and performing unexpected tasks, which constitutes an emergent group.[156] As the magnitude and scope of an event grows, emergence grows as well, which explains why it is more evident in larger MCIs.[157]

As the response progresses, the group of immediate responders continues to show the attributes of an emergent group. During the interim between the onset of the incident and when the professional help arrives, the group improvises to achieve the collective goal of saving others; for example, as seen in Las Vegas, they may commandeer personal vehicles for patient transport. Adaptability and creative problem solving are key attributes of emergent groups. During this time, the immediate responders are replacing the official entities traditionally assigned to this role simply because those organizations have not yet arrived, and the need is pressing. Even with no organizational structure and no authoritative leadership, the group instinctively understands its narrow role. Though the group may appear more chaotic than traditionally structured response organizations, there is order in the chaos. As others see the immediate responders in action, many join the group. Simultaneously, other members will physically leave the group, perhaps carrying victims to an ambulance or driving them to a hospital. In this way, the membership of the group is always in flux. With the changing membership, the importance of continuous feedback and learning remains important throughout the operation.

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155 Twigg and Mosel, “Emergent Groups.”

156 Twigg and Mosel.

157 Tierney, “Facing the Unexpected.”

As professional rescuers arrive, the group will likely continue its work, especially in response to MCIs with a great many patients, such as the World Trade Center, Madrid train bombings, Boston Marathon, Las Vegas festival shooting, and Orlando nightclub shooting. The group may recognize the inadequacy of the resources available from EMS, or the group members may be impatient with bureaucratic command-and-control activities.[158] The emergent group can also perpetuate due to the large geographic area of an MCI or a delay in rescuers reaching the scene, as was seen with the barricade in Orlando. Responding to the evolving conditions and feedback, the immediate responders may change their roles; for instance, they may begin taking patients to professional caregivers or ambulances rather than transporting them directly to the hospital. The emergent group now shifts from replacing an organization to supplementing it, another type of disruption seen in emergence. Nonetheless, the emergent group of immediate responders exists only temporarily. It disbands just as quickly as it formed; once the demand is alleviated, the group is dissolved, usually by the end of the crisis. There is no formal dissolution but rather a relaxed diffusion of the members.

Emergency management recognizes spontaneous volunteers and donations during later phases of response and recovery. In fact, the National Response Framework includes an annex for volunteer and donation management. The focus of the annex is contributions that occur later, such as meal provision, housing, clothing and monetary donations, and personnel services.[159] Yet emergency plans do not consider the emergent group of empowered immediate responders that drive the initial response of an MCI. Without incorporation of this known phenomenon, responses are prone to be plagued by duplicative work or, worse, conflicting efforts during a time when no resources can be spared.

Emergent behavior occurs out of necessity: it starts because there are no formal emergency services immediately available to victims. But it continues even when professional response agencies arrive. This is partially because the volume of patients still

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158 Stallings and Quarantelli, "Emergent Citizen Groups."

159 "Volunteer and Donations Management Support Annex," Federal Emergency Management Agency, May 2013, https://www.fema.gov/media-library-data/20130726-1914-25045-9213/nrf_support_annex_volunteer_20130505.pdf.

outweighs the resources available on the scene. It is also because the outdated, inflexible, and cumbersome command-and-control model used by EMS cannot adequately address an extraordinary MCI in a timely manner. Emergence fills this void. And, because the same outdated MCI approach is used by EMS across the United States and many other countries, emergence is not an aberration. It occurs at some level at every MCI and is occurring more frequently as violent MCIs become more commonplace and involve more victims. Emergence of immediate responders at an MCI cannot be stopped, nor should it be. It plays a critical role in addressing a novel, overwhelming situation where all resources are valuable. In this sense, immediate responder emergence should be viewed as a valuable resource to be leveraged to provide the optimal outcome for victims of an MCI.

Emergence does produce several challenges for responders and incident management. Immediate responders can congest scenes and travel routes, making it difficult or impossible for professional rescuers to arrive and deliver care. Because there is no leader or hierarchy in the emergent group, incident commanders cannot easily communicate or integrate with the group during the response. Civilians are passionate about providing help but are often unaware of other considerations, such as even patient distribution to appropriate hospitals. The immediate responders see speed as one of their main advantages; when professional responders try to apply official decision-making processes or deliberately slower methods, immediate responders often become impatient and insubordinate. The constant changes to the group membership, a prevalent feature in emergent groups, make it difficult to establish and maintain a reliable and competent workforce. Immediate responders are not equipped with protective equipment and often put themselves in harm's way, either knowingly or unknowingly, which can further stress the response system.

C. SUMMARY

Immediate responders are excluded from MCI plans, perhaps because of false assumptions that say bystanders tend to panic or are unwilling to help. However, recent events have disproven these myths. Bystanders and victims alike show prosocial and rational behavior. In fact, they often become an emergent group of immediate responders.

The group forms naturally, with no formal structure or leadership, advancing toward the goals of patient treatment, evacuation, and transportation. The group is dealt new and unfamiliar tasks, but it responds because the victims and event are not being addressed by traditional resources. Immediate responder groups form out of necessity, operate organically, and yield positive results. However, the untrained and unequipped emergent group can also produce challenges, such as a disconnect between incident command and the immediate responders, congestion at the scene, and the bypassing of EMS in favor of means that appear more expedient. Planners must be aware of both the positive and negative impacts of immediate responder action.

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IV. POSITIVE AND NEGATIVE IMPACTS OF IMMEDIATE RESPONDER ACTION IN MCIS

Following disasters, such as the MCIs explored in this thesis, many bystanders become immediate responders. During and after violent attacks, these immediate responders begin evacuating, treating, and transporting themselves and each other to hospitals. Recent events have shown both the positive and negative impacts of immediate responder emergence. For example, immediate responders have provided life-saving treatment and transport for the severely injured, but they have also inaccurately prioritized patients, caused over-convergence at the closest hospital, and caught hospital resources off-guard in a system that expects prehospital treatment and notification by emergency medical services. This chapter explores the impact of immediate responders in more detail.

A. POSITIVE IMPACTS OF IMMEDIATE RESPONDER ACTION

The actions of immediate responders play a critical role in MCI response, especially those caused intentionally. Immediate responders are on the scene when the incident occurs, allowing them to render aid without delay. They also have access to areas that professional responders cannot get to quickly, often caused by scene security concerns. From providing immediate life-saving care to transporting victims, immediate responders fill the response gap and augment the strained emergency response system.

1. Immediate Care and Life-Saving Interventions

Boston: Critical Care on Boylston Street

During the Boston Marathon on April 15, 2013, brothers Dzhokhar and Tamerlan Tsarnaev, age nineteen and twenty-six, respectively, walked into the dense crowd of spectators gathered on Boylston Street, a few hundred yards from the finish line.[160] Each brother carried a backpack containing a pressure cooker. Following directions found in *Inspire* magazine, published by al Qaeda, the brothers had carefully rigged the pressure

160 "Investigation into Boston Marathon Bombings," *Washington Post*, accessed April 23, 2020, http://www.washingtonpost.com/wp-srv/special/national/boston-marathon-explosions-map/.

cookers with explosives, blast caps, shrapnel, nails, and ball bearings.[161] The pair carefully set their backpacks onto the sidewalk and walked away. The thousands of people in the crowd were focused on the marathon; no one noticed that a weapon of mass destruction had been dropped at their feet. At 2:49 PM, the first device was triggered by a radio-controlled toy car remote, setting off an enormous explosion.[162] Just fourteen seconds later, the second device, one block west of the first, was detonated.[163] Within seconds, hundreds of spectators were severely maimed. The shrapnel and debris that was projected at hundreds of miles per hour at ground level immediately sheered limbs and major blood vessels. The debris, coupled with the blast wave, created life-threatening conditions for 70 percent of the victims.[164]

Like in similar emergencies, civilian responders emerged, treated, and provided transport to victims. As medical teams were unable to treat the plethora of victims and tourniquets were exhausted, immediate responders quickly used shirts, belts, and other devices to control bleeding.[165] With the help of the civilians, 83 percent of patients with exsanguinating extremity wounds received tourniquets prior to arrival at the hospital, an intervention that certainly saved lives.[166] Carlos Arredondo, who minutes earlier was passing out American flags to veteran runners, ran to a spectator who had lost both his legs,

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161 "Search of Tsarnaevs' Phones, Computers Finds No Indication of Accomplice, Source Says," U.S. News, April 23, 2013, http://usnews.nbcnews.com/_news/2013/04/23/17877288-search-of-tsarnaevs-phones-computers-finds-no-indication-of-accomplice-source-says.

162 Jonathan D. Gates et al., "The Initial Response to the Boston Marathon Bombing: Lessons Learned to Prepare for the Next Disaster," *Annals of Surgery* 260, no. 6 (December 2014): 960–66, https://doi.org/10.1097/SLA.0000000000000914.

163 Gates et al.

164 Ajay K. Singh et al., "Blast Injuries: From Improvised Explosive Device Blasts to the Boston Marathon Bombing," *RadioGraphics* 36, no. 1 (January 2016): 295–307, https://doi.org/10.1148/rg.2016150114.

165 Art Hsieh, "5 Triage Lessons Learned from the Boston Marathon Bombing," EMS1, January 16, 2014, https://www.ems1.com/ems-products/Bleeding-Control/articles/1649473-5-triage-lessons-learned-from-the-Boston-Marathon-Bombing/.

166 Gates et al., "The Initial Response to the Boston Marathon Bombing."

controlled the bleeding and helped carry him to medical attention.[167] Former New England Patriots player Joe Andruzzi was seen grabbing a woman and carrying her to a hospital.[168]

These same citizens carried patients to medical tents and local hospitals. Within eighteen minutes of the event, all patients had been transported to a medical tent or hospital, with many of those transports conducted by civilians in an improvised fashion.[169] The close proximity of several Level I and Level II trauma centers allowed patients to be relatively evenly distributed. Doctors present at the event and in receiving hospitals credit the immediate responders with saving lives because of the speed they afforded in treating and moving patients in a system that was vastly overwhelmed.[170]

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Throughout the world, the public understands that its role in a medical emergency is to summon help from professional responders. The time that passes between the onset of the emergency and when professional help can arrive is known as the "silent response gap," according to Dr. Isaac Ashkenazi, professor of disaster medicine at Ben-Gurion University of the Negev in Israel.[171] In minor emergencies, this gap may not be impactful. However, when addressing life-threatening conditions, initiating care during this gap is critical to survival and minimizing morbidity. The public is in the closest proximity to injured people after emergencies. No matter how laudable the EMS response time, there will always be a delay. These delays, sometimes significant, can be caused by EMS taking and dispatching the call, traveling to the scene, navigating traffic, encountering other patients on the way, and traversing terrain of crowds and obstructions. During MCIs that are the result of violence, fire and rescue personnel can be further delayed due to ongoing

[167] Christina Ng, "Boston Marathon Bystanders Raced to the Rescue," ABC News, April 16, 2013, https://abcnews.go.com/US/boston-marathon-bystanders-raced-rescue/story?id=18966272.

[168] Ng.

[169] Hsieh, "5 Triage Lessons."

[170] Hsieh.

[171] Ashkenazi and Hunt, "You're It."

threats or secondary device detection. It is during this time that many civilians transition from passive bystanders to an active ones, becoming immediate responders.[172]

Following a traumatic injury, hemorrhage is the leading cause of preventable death.[173] With serious bleeding injuries, a person can bleed to death in as little as five to eight minutes, long before professional rescuers arrive. Even with the complete loss of a limb, external bleeding from an extremity can always be controlled. Relatively simple interventions, such as direct pressure, compression bandages, and tourniquets, can stanch bleeding until the victim receives definitive care. Wounds to the chest, abdomen, and back can be temporarily stabilized with an occlusive dressing. Even without treatment, a patient's life can often be saved if they are simply transported to a hospital quickly. When neither immediate responders nor professional rescuers can reach patients promptly, the effects can be profound. A retrospective analysis of the wound patterns of those killed in the Pulse Nightclub shooting found that of the forty-nine dead, sixteen had injuries that would have been survivable if prehospital care had been provided within the first ten minutes.[174]

Despite the devastating nature of the bombs at the Boston Marathon, only three people died. Referencing the flood of spectators who applied pressure and tourniquets to wounds, a study in the *New England Journal of Medicine* found that the low fatality rate was, in large part, due to the "courageous civilians."[175] Similarly, in Orlando, the quick action of immediate responders and law enforcement to transport patients to a Level I

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[172] Ashkenazi and Hunt.

[173] Paige Williams, "Turning Bystanders into First Responders," *New Yorker*, April 8, 2019, https://www.newyorker.com/magazine/2019/04/08/turning-bystanders-into-first-responders.

[174] E. Reed Smith, Geoff Shapiro, and Babak Sarani, "Fatal Wounding Pattern and Causes of Potentially Preventable Death Following the Pulse Night Club Shooting Event," *Prehospital Emergency Care* 22, no. 6 (November 2, 2018): 662–68, https://doi.org/10.1080/10903127.2018.1459980.

[175] Paul D. Biddinger et al., "Be Prepared—The Boston Marathon and Mass-Casualty Events," *The New England Journal of Medicine* 368, no. 21 (May 23, 2013): 1958–60, http://dx.doi.org/10.1056/NEJMp1305480.

trauma center only three blocks away allowed for early hemorrhage control and rapid resuscitation.[176]

2. Additional Hospital Transport Assets

Orlando: Outside the Club, Nowhere Close Enough to Help

At the Pulse Nightclub shooting in Orlando on June 12, 2016, even after victims escaped the building and were away from immediate danger, they were still nowhere close enough to the help they desperately needed. Emergency medical personnel were staged a block away from the club, waiting for the police to tell them the shooter was no longer a threat to them.[177] Even the personnel staffing the fire station next door to the club, Orlando Fire Department Station 5, did not respond to knocks from victims, remaining on lockdown because of the nearby shooting.[178] During that delay, immediate responder intervention was critical to saving lives. Patrons joined together to carry patients to ambulances blocks away. Others kept going, carrying patients the three blocks to Orlando Regional Medical Center. Officer Joe Imburgio of the Orlando Police Department had rushed to the scene to neutralize the shooter. His role quickly changed as immediate responders loaded his pickup truck with shooting victims and he ferried the makeshift ambulance back and forth.[179]

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Prompt transportation to definitive care, such as hospitals, is just as important as immediate care for life-threatening injuries. Prehospital care can sustain many patients for some amount of time, but that period is finite. Serious wounds require professional intervention, including medication, procedures, specialty supplies, and surgery for stabilization, all of which require hospitalization. The limited number of ambulances at MCIs introduces a substantial challenge to expedient transportation of the injured. Because

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[176] Michael Cheatham et al., "Orlando Regional Medical Center Responds to Pulse Nightclub Shooting," *The Bulletin of the American College of Surgeons* 101, no. 11 (November 1, 2016): 12–20.

[177] Aboraya, "Orlando Paramedics."

[178] National Police Foundation, "After-Action Review of the Orlando Fire Department Response."

[179] Abe Aboraya, "Chaos in the ER: How Mass Shootings Flood Trauma Centers," WMFE, October 13, 2017, https://www.wmfe.org/chaos-in-the-er-how-mass-shootings-flood-trauma-centers/78833.

of the lack of sufficient resources, along with real and perceived delays, immediate responders transport most patients from the scene to the hospital.

At the World Trade Center attack, 93 percent of patients were transported by immediate responders.[180] Following the Madrid train bombings, immediate responders brought 67 percent of patients to the hospital. After the Boston Marathon bombing, immediate responder assistance ensured that all patients reached a field medical tent or hospital within eighteen minutes.[181] At the Pulse Nightclub shooting in Orlando, a similar pattern emerged: immediate responders transported 70 percent of patients.[182] And as Las Vegas Metropolitan Police Department officers arrived at the Route 91 Harvest Festival, they began conducting improvised triage and used their cruisers to immediately transport patients.[183] Rideshare drivers reported to the scene to offer rides to the injured.[184] Municipal bus drivers stopped at hotels and the venue to transport victims to hospitals.[185] Nonmedical personnel transported 50 percent of the patients, in most cases, before emergency medical services arrived.[186]

Even when EMS is on the scene, survivors will often bypass established triage and treatment sites.[187] Sometimes survivors and immediate responders do not even know these options exist because they are not readily apparent. Other times victims will choose to bypass these scene services either because they appear to be saturated with patients or

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[180] M.G. Guttenberg, A. Asaeda, and A. Cherson, "Utilization of Ambulance Resources at the World Trade Center: Implications for Disaster Planning," *Annals of Emergency Medicine* 40, no. 92 (2002).

[181] Jaimy Lee and Maureen McKinney, "Preparedness under Assault: While Boston's Response to Bombing Showed Crucial Role of Planning, Strides Elsewhere in Emergency Readiness Could Be Undermined by Budget Cuts," *Modern Healthcare* 43, no. 16 (April 2013): 6–7, 16, 1.

[182] Association of State and Territorial Health Officials, *The Pulse Nightclub Shooting in Orlando, Florida: A Peer Assessment of Preparedness Activities' Impact on the Public Health and Medical Response* (Arlington, VA: Office of the Assistant Secretary for Preparedness and Response, 2017).

[183] Federal Emergency Management Agency, *1 October After-Action Report*, 18.

[184] Federal Emergency Management Agency.

[185] Federal Emergency Management Agency.

[186] Federal Emergency Management Agency, 1.

[187] Tierney, "Facing the Unexpected."

because they are viewed as a lower level of care than what is available at the hospital.[188] In general, survivors will use the most expedient means to access hospital care.[189]

Just as with initial treatment, transport by immediate responders provides an important force multiplier. It allows for diffusion of the burden of transport across a number of resources, including self-transport and buddy transport. By adding personal cars, taxis, ride shares, buses, police cars, and other nonmedical vehicles as transport options, the victims are delivered to the hospital faster than they would be by relying on ambulances alone. Some patients transported by a means other than EMS arrive to the hospital in the same state as they were found, with no treatment conducted to stabilize their injuries.[190] However, recognizing that the definitive care for a trauma patient is a hospital setting, leveraging all available treatment and transport resources to minimize delay in patient arrival is important.[191] This tactic provides an arguably better outcome than forcing patients to wait until sufficient traditional EMS resources are available.[192]

B. CHALLENGES OF IMMEDIATE RESPONDER INTERVENTION

Recognizing the positive outcomes of immediate responder actions, researchers have explored how that same behavior could inadvertently have negative impacts as well. Ronald Perry explains how disaster itself disrupts normal society and social behavior, and even positive behavior can have a far-reaching impact beyond the disaster.[193] Gary Kreps and Susan Bosworth believe that the helping behavior could prevent people from

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188 Quarantelli, Taylor, and Tierney, "Delivery of Emergency Medical Services."

189 Tierney, "Facing the Unexpected."

190 Auf der Heide. "The Importance of Evidence-Based Disaster Planning," 41.

191 Alden Woods, "Las Vegas Shooting: Patients Went to Wrong Hospital as Misinformation Spread," *Reno Gazette Journal*, December 5, 2017, https://www.rgj.com/story/news/2017/12/05/las-vegas-shooting-patients-went-wrong-hospital-misinformation-spread/922474001/.

192 Auf der Heide, "The Importance of Evidence-Based Disaster Planning," 41.

193 Ronald W. Perry, "Managing Disaster Response Operations," *Emergency Management: Principles and Practice for Local Government* (1991): 201–23.

contributing to their normal roles in society, thereby broadening the impact.[194] Auf der Heide also discusses the more immediate shortfalls of bystander action, mainly the lack of centralized coordination.[195] Auf der Heide's later research elaborates on how the lack of coordination among immediate responders and response agencies manifests; for instance, immediate responder intervention can make it so emergency medical services are unable to control the scene, which can lead to several undesirable outcomes.[196] Wenger, Quarantelli, and Dynes explain that professional responders are often distracted by over-convergence of volunteers.[197] At times, immediate responders are so inclined to help that emergency personnel must physically restrain the immediate responders from exposing themselves to more danger.[198] This builds on the previous literature, showing that not only does immediate responder action occur, it also has real impacts, both positive and negative.

After-action reviews conducted by response agencies, media reports, and literature regarding recent MCIs have supported the fact that altruistic immediate responder behavior also produces challenges. One of the most common issues is poor distribution of patients to hospitals.[199] EMS distributes patients according to urgency, type of injury, travel time, and hospital saturation. Untrained civilians tend to transport to the closest facility, which overwhelms that hospital and may not be the appropriate specialty center for the type of injury. Immediate responders also tend to attend to the first patient they come across, treating and transporting patients with relatively minor injuries while other patients with more severe injuries await help. This delays help to the seriously injured and also inundates the hospital with low-acuity patients, leading to a misappropriation of resources. Immediate responders offer a promising workforce multiplier that is critical during an MCI. However,

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194 Gary A. Kreps and Susan Lovegren Bosworth, "Organizational Adaptation to Disaster," in *Handbook of Disaster Research*, ed. Havidán Rodríguez, Enrico L. Quarantelli, and Russell R. Dynes (New York, NY: Springer, 2007), 297–315, https://doi.org/10.1007/978-0-387-32353-4_17.

195 Auf der Heide, *Disaster Response*.

196 Auf der Heide.

197 Wenger, Quarantelli, and Dynes, "Disaster Analysis."

198 Perry, "Managing Disaster Response Operations."

199 Richard M. Zoraster, Cathy Chidester, and William Koenig, "Field Triage and Patient Maldistribution in a Mass-Casualty Incident," *Prehospital and Disaster Medicine* 22, no. 3 (June 2007): 224–29, https://doi.org/10.1017/S1049023X00004714.

without a plan to incorporate immediate responders and manage their response, their goodwill will continue to be counterproductive in many respects.

1. Poor Triage, Misdirected Efforts

Las Vegas: An Ambush of Altruism

As ambulances arrived to the Route 91 Harvest Festival shooting on October 1, 2017, they were overrun by well-meaning civilians who grabbed all medical equipment and took it to patients across the field.[200] Ambulances and emergency personnel could not penetrate into the center of the field because they were confronted by wounded people upon their arrival on the periphery, further delaying professional care for some of the most dangerously injured. Immediate responders rushed the infield medical tent, causing several altercations, often exacerbated by intoxication.[201] Desperately seeking a safe location, helpful civilians carried the wounded into nearby hotels. This caused confusion, as these hotels called 911 to report shooting victims, leading emergency response officials to assume there were multiple shooters in numerous hotels, further diluting and depleting their response assets.[202]

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When encountered with a volume of patients with injury patterns that will exhaust immediately available resources, medical providers are forced to assess patients and triage them according to the nature of their injury. This utilitarian method is meant to have maximum impact for the most people.[203] Triage is intended to identify the small proportion of patients who are critically injured but salvageable, and direct the limited

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[200] Federal Emergency Management Agency, *1 October After-Action Report*.

[201] Federal Emergency Management Agency.

[202] Federal Emergency Management Agency.

[203] Annelie Holgersson, "Review of On-scene Management of Mass-Casualty Attacks," *Journal of Human Security* 12, no. 1 (2016): 104, http://doi.org/10.12924/johs2016.12010091

resources and transport assets to them in the most expedient manner.[204] Because of the unusual circumstances, this response differs from the typical patient assessment or the typical EMS decision-making process. During MCIs, providers must alter their standards of care, taking on a battlefield mentality and limiting treatment to damage control.[205] Patients are typically divided into the categories shown in Table 1.

Table 1. Triage Categories of Patients of Mass Casualty Incidents[206]

Category	**Condition**	**Treatment**	**Typical Percentage of Total Patients**
Red/Immediate	Patients with immediate life-threatening injuries that remain salvageable.	These patients require immediate intervention and transport. They are to be treated and transported first.	10% or less
Yellow/Delayed	Patients who have potentially life-threatening injuries but do not need immediate intervention.	These patients are currently stable but will need medical assistance within several hours. They do not require immediate transport but should be reassessed often and transported to a hospital as soon as the red patients are evacuated.	~ 15%
Green/Minor	Patients who have minor injuries that are not life-threatening.	These patients, commonly referred to as *walking wounded*, do not need medical attention for several days. Transport	~ 75–80%

[204] Dennis Edgerly, "The Basics of Mass Casualty Triage," *Journal of Emergency Medical Services* 41, no. 5 (May 1, 2016), https://www.jems.com/articles/print/volume-41/issue-5/departments-columns/back-to-basics/the-basics-of-mass-casualty-triage.html.

[205] Holgersson, "On-scene Management," 104.

[206] Adapted from A.J. Heightman, "The BLAST Approach: Rethinking the Way We Approach MCI Triage," *Journal of Emergency Medical Services* 43, no. 4 (2018), https://www.jems.com/articles/print/volume-43/issue-4/departments-columns/from-the-editor/the-blast-approach-rethinking-the-way-we-triage.html.

Category	Condition	Treatment	Typical Percentage of Total Patients
		should be delayed or alternative sites found to keep these patients from detracting from the care offered to the red and yellow patients.	
Black/Deceased	Patients who have died or have injuries that will certainly lead to death.	The severity of injuries and limited resources mean the patient is unlikely to survive regardless of interventions. Patients should be provided with palliative care, if possible, and not transported.	N/A

During this initial encounter with patients, providers are expected to perform only immediate life-saving interventions, such as adjusting airways or controlling a massive hemorrhage. Triage time is to be limited to a thirty- to sixty-second encounter with each patient.[207] The existing model calls for patients to be treated and transported in order of triage categories. While awaiting transport, patients are staged in treatment areas where on-scene clinicians can provide basic prehospital medical care. It is upon this model of sorting patients and regulating care that the entire continuum of care is based, from resource allocation, to rate of patient transport, to destination decision.

Laypeople are rarely trained in medical care, much less the concepts and parameters of MCI triage. Civilians do not conduct thorough patient assessments and therefore can miss critical injuries. For example, an immediate responder may immediately treat profuse venous bleeding from an extremity, which is not life-threatening but is obvious, while completely overlooking a punctured chest wound, which is life-threatening but less conspicuous. Immediate responders are also unable to differentiate between severe injuries

[207] Joseph Mistovich, Keith Karren, and Brent Hafen, *Prehospital Emergency Care*, 10th ed. (New York, NY: Pearson, 2013).

and those that merely appear serious. In training scenarios, students often choose to address superficial bleeding before positioning a closed airway.[208] Immediate responders also may be more familiar with skills such as superficial bleeding control than they are with others, such as airway management, that need to be administered urgently. Therefore, they may be able to treat only the less serious injuries, rather than knowingly deprioritizing the more severe conditions. Additionally, immediate responders devote time and resources to unsalvageable patients, such as those in traumatic cardiac arrest, while those with more promise of survival deteriorate nearby. Civilians will, understandably, prioritize family, friends, and those they know over strangers, regardless of the severity of the injury.[209] Finally, immediate responders tend to treat the first patient they come across; in doing so, it is rare that immediate responders accurately identify, then provide treatment to, the 10 to 25 percent of patients who need immediate help.[210]

Some of the recent antagonistic MCIs have resulted in staggering numbers of victims.[211] In each case, 75 to 80 percent of these patients were walking wounded, meaning they did not need medical care for many hours or days.[212] Nonetheless, due to their accessibility and sheer numbers, these patients overwhelmed resources and congested treatment areas, including hospitals.[213] Many of these patients sought their own means of transportation and medical help, usually at the closest hospital, resulting in the closest medical resources being overwhelmed by lower-priority patients.[214]

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208 Sudha Jayaraman et al., "First Things First: Effectiveness and Scalability of a Basic Prehospital Trauma Care Program for Lay First-Responders in Kampala, Uganda," *PLOS ONE* 4, no. 9 (September 11, 2009): e6955, https://doi.org/10.1371/journal.pone.0006955.

209 Thomas E. Drabek and David A. McEntire, "Emergent Phenomena and the Sociology of Disaster: Lessons, Trends and Opportunities from the Research Literature," *Disaster Prevention and Management* 12, no. 2 (2003): 97–112, http://dx.doi.org.libproxy.nps.edu/10.1108/09653560310474214.

210 Heightman, "The BLAST Approach."

211 Auf der Heide, "The Importance of Evidence-Based Disaster Planning," 40; Carresi, "The 2004 Madrid Train Bombings"; Holgersson, "Review of On-scene Management"; Federal Emergency Management Agency, *1 October After-Action Report*.

212 Heightman, "The BLAST Approach."

213 A.J. Heightman, Scott Mohlenbrok, and Marc Eckstein, "Disaster on the Rails," *Journal of Emergency Management*, March 31, 2005, https://www.jems.com/articles/2005/03/disaster-rails.html.

214 Auf der Heide, "The Importance of Evidence-Based Disaster Planning," 41.

Even on the scene, low-priority patients can cause misalignment of medical resources. At the Atocha station in Madrid, which has many exits and is close to many major roads, patients who had minor injuries exited the station in many different directions, intercepting EMS vehicles headed to the scene.[215] The victims with more serious injuries who were unable to self-evacuate were left on the platform. EMS personnel were hindered from reaching the platform by the onslaught of people with minor injuries clogging streets, obstructing entrances, and demanding medical attention. Immediate responders and victims moved toward safety before EMS could establish treatment areas and, even once the areas were in place, victims bypassed the option, instead choosing immediate transport to definitive care. Meanwhile, the more severely injured patients had no choice but to await triage and transport from EMS, which led to a delayed arrival at a hospital. The Disaster Research Center notes that this results in "reverse-triage," wherein the least serious patients arrive at the hospital first.[216] Beyond the initial misallocation of resources, this can also lead receiving facilities to be unaware that more serious cases are yet to arrive.[217] Hospitals are lulled into a false sense of security, assuming that the injuries they receive first are representative of the most severe patterns they will see, as is asserted in MCI response plans. Referring to the World Trade Center attack of 2001, Ronald Simon and Sheldon Teperman state, "It is clear from this attack and other disaster that local hospitals will rapidly be swamped by anyone that can get there on their own."[218]

With a significant imbalance between patient demand and medical resources, triage is a cornerstone of effective MCI management. On-scene triage is emphasized because it presents the first opportunity for medical professionals to evaluate the situation as a whole, begin prioritizing patients, allocate scarce resources, and initiate controlled patient flow through the continuum of care. In this way, triage sets the stage for the remainder of the incident management, both on scene and beyond. Undermining that foundational step can disrupt the expected flow of patients in terms of acuity and rate. As more immediate

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[215] Carresi, "The 2004 Madrid Train Bombings."

[216] Auf der Heide, "The Importance of Evidence-Based Disaster Planning," 44.

[217] Auf der Heide, 44.

[218] Simon and Teperman, "The World Trade Center Attack."

responders transport patients from MCIs, it will become important to adapt and develop new means of performing triage, most likely at the receiving facility.

2. Maldistribution of Patients to Hospitals

Madrid: Three Hundred Patients in One Hospital, Five in Another

Following the train bombings in Madrid, the two closest hospitals were inundated with 48 percent of the patients; the remaining 52 percent were distributed to the other fifteen hospitals and primary health facilities.[219] The closest hospital, Gregorio Marañón, struggled to treat 312 patients over several hours, while Puerta de Hierro University Hospital, less than twenty-five minutes away, received only five patients.[220] The nearby military hospital (Central de la Defensa), which permanently maintains a large bed and staff capacity to receive MCI patients and had been used in every disaster exercise previously, received only fifty-seven patients.[221] Public safety entities did not have control over the scene or distribution of patients following the event; the public did.[222]

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A consistent challenge with immediate responder action following MCIs is the unequal distribution of patients to surrounding hospitals, with the closest hospital receiving the majority of patients.[223] The Disaster Research Center found that in 75 percent of MCIs, more than half of the patients were transported to the closest hospital.[224] In 46 percent of the cases, more than 75 percent of patients went to the closest hospital.[225] In these cases, the underused—or unused—surrounding hospitals had an average bed vacancy of

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219 Carresi, "The 2004 Madrid Train Bombings."

220 Carresi.

221 Carresi.

222 Peral Gutierrez de Ceballos et al., "11 March 2004."

223 Holgersson, "Review of On-Scene Management," 106.

224 Auf der Heide, "The Importance of Evidence-Based Disaster Planning," 41.

225 Auf der Heide, 41.

20 percent.[226] Of the 7,364 patients from the 9/11 World Trade Center attack, less than 7 percent were transported to the hospital by emergency medical services; the rest self-transported or were brought by immediate responders.[227] Not surprisingly, the hospitals closest to the scene were overwhelmed with patients while hospitals only slightly farther away were underutilized.[228]

After the Pulse Nightclub shooting, Orlando Regional Medical Center, the closest hospital to the incident, treated forty-nine of the fifty-eight victims (85 percent) transported to hospitals.[229] The sheer number of patients challenged resources, as did their rate of arrival. Within thirty-six minutes, the hospital had received thirty-six patients with gunshot wounds who had been transported by police cars and vans, private cars driven by immediate responders, and by the patients themselves, if they were able to walk.[230]

Following the Route 91 Harvest Festival shooting, immediate responders quickly transported patients to the closest hospital, upending Metropolitan Las Vegas's trauma response plan, which calls for even distribution of MCI patients. Sunrise Hospital and Medical Center, a Level II trauma center, received 199 patients in the first few hours.[231] Staff, resources, and physical space ran thin at Sunrise, which used all of its universally compatible O-negative blood in the twenty-eight surgeries it completed in the first twenty-four hours after the shooting.[232] Meanwhile, the University Medical Center, three miles away and the state's most comprehensive trauma center, received only 104 patients and reported that many of its beds went unused.[233] Hours after the incident, the University Medical Center still had nine empty trauma rooms and three open operating rooms.[234]

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[226] Auf der Heide, 41.

[227] Auf der Heide.

[228] Simon and Teperman, "The World Trade Center Attack.

[229] Cheatham et al., "Orlando Regional Medical Center Responds."

[230] Aboraya, "Chaos in the ER."

[231] Woods, "Las Vegas Shooting."

[232] Woods.

[233] Woods.

[234] Woods..

This poor distribution occurs when patients are transported by means other than EMS, often bypassing triage and transportation disposition points.[235] Ideally, the patients with minor injuries who are able to self-evacuate would be directed to more distant hospitals, conserving the nearby resources for the severely injured.[236] However, without EMS managing the distribution, it is impossible to control the patients' destination, the quantity that arrives at each hospital, or the rate of arrival.[237] This often causes the closest hospitals to become overwhelmed by an initial wave of minor injuries.[238] In addition to occupying precious resources, these less serious patients congest the area, preventing more serious patients from receiving the critical care they need.

The closest hospital is not always a specialty center, which is a facility designed with special care teams and capabilities to address severe, traumatic injuries seen in MCIs, such as amputations, pediatric patients, chemical exposure, burns, and spinal injuries. While community hospitals can perform some of the stabilizing treatments needed to keep a victim alive, a patient that needs specialty care must eventually be transported to a specialty facility. In traditional MCI response planning, EMS plays a critical role in identifying those patients and transporting them to the appropriate center. But, as demonstrated in the case studies, immediate responders will typically transport victims to the closest hospital, regardless of injury type. If the closest facility happens to be a specialty center, it risks being overwhelmed by patients who do not truly require specialty care. As mentioned, a Level II trauma specialty center received the majority of the victims in Las Vegas, most of whom could have been treated at a non-specialty center.[239] Research shows

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[235] Holgersson, "Review of On-scene Management," 106.

[236] Holgersson, 106.

[237] Auf der Heide, "The Importance of Evidence-Based Disaster Planning," 41.

[238] Auf der Heide, 36.

[239] Woods, "Las Vegas Shooting."

that, when overwhelmed during an MCI, a Level I trauma center quickly becomes dysfunctional, which can lead to higher victim mortality.[240]

Distribution of casualties to the most suitable location for the patient and system is critical to the outcome of the patient and the functioning of the broader system.[241] EMS must consider bed availability, the hospital's ability to manage the specific wound pattern, and equitability among facilities.[242] When EMS is unable to manage patient flow, it is critical for the health care domain to regain control of the situation very early on. This will result in redistribution of the patients to stabilize the system. If hospitals view patients as their property and do not transfer them, patient care is compromised.[243]

During an MCI, hospitals must position themselves as casualty distribution stations rather than a final destination for definitive care for all who arrive, as they typically would.[244] This means that the receiving facility must triage patients and determine who requires immediate, life-saving interventions. The remainder of the patients should be redistributed to other facilities via secondary transport.[245] Patients with injuries that are not time-sensitive should be transported via ambulance, van, or bus to a hospital far enough away that it is not immediately impacted by the event.[246] This distribution must be carefully orchestrated with all hospitals to absorb patients in a fashion that balances patient needs with system resources, and should be done in coordination with EMS, who will be bringing additional patients via ambulance from the scene.[247] Ambulances should be directed to bypass the closest hospital if doing so will not impact patient care, in order to

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240 Ülkümen Rodoplu et al., "Impact of the Terrorist Bombings of the Hong Kong Shanghai Bank Corporation Headquarters and the British Consulate on Two Hospitals in Istanbul, Turkey, in November 2003," *Journal of Trauma: Injury, Infection, and Critical Care* 59, no. 1 (July 2005): 195–201, https://doi.org/10.1097/01.TA.0000171527.49354.8F.

241 Holgersson,. "Review of On-scene Management," 106.

242 Holgersson, 106.

243 Simon and Teperman, "The World Trade Center Attack"; Simoneaux, "After Las Vegas Shooting."

244 Holgersson, "Review of On-scene Management," 106.

245 Holgersson, 106.

246 Holgersson, 106.

247 Auf der Heide, "The Importance of Evidence-Based Disaster Planning," 42.

avoid further contributing to the over-convergence at the facility.[248] EMS must consider using what is known as the *first-wave protocol*, a formula of preplanning that determines surge capacity and distribution of a network of local hospitals.[249] This controls not only the number of patients reporting to each hospital, but also the rate at which they arrive, one of the more critical aspects of MCI management.[250]

During an MCI, it is impossible to prevent victims from being transported to hospitals by means other than ambulances; perhaps this is even desirable.[251] Planners who incorrectly assume that EMS and public safety authorities will have control of patient distribution fail to prepare the system for this reality.[252] Emergency plans must include stipulations to account for this practice and should provide a means for directing immediate responders to the most appropriate facility. This could include public address, radio, and emergency cellular push notifications. Public safety agencies can also provide throw kits containing first aid supplies for immediate responders to treat life-sustaining care during transport.[253] Recognizing that the bulk of patients will self-evacuate to the nearest hospital, ambulances should consider transportation to other facilities.[254]

3. No Notice to Hospitals, Unique Conditions of Patients

Las Vegas: A Secondary MCI at the Hospital

Following the Route 91 Harvest Festival shooting in Las Vegas on October 1, 2017, hospitals were immediately overrun with patients, with little, if any, notice. The first patients to arrive at Sunrise Hospital and Medical Center, which ultimately received 220 patients from the incident, arrived in police cars and private vehicles; the patients were

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248 Auf der Heide, 36.

249 Auf der Heide, 42.

250 Christopher J. Aylwin et al., "Reduction in Critical Mortality in Urban Mass Casualty Incidents: Analysis of Triage, Surge, and Resource Use after the London Bombings on July 7, 2005," *The Lancet* 368, no. 9554 (December 23, 2006): 2219, http://dx.doi.org/10.1016/S0140-6736(06)69896-6.

251 Auf der Heide, "The Importance of Evidence-Based Disaster Planning," 41.

252 Auf der Heide, 36.

253 Federal Emergency Management Agency, *1 October After-Action Report*, 13.

254 Holgersson, "Review of On-scene Management," 102.

grievously injured, and the notification that EMS typically provides to hospitals was absent. A physician reported that there were three to four gunshot victims in each arriving police car and private vehicle.[255] Ambulances were the last to arrive. The University Medical Center of Southern Nevada, which received 110 patients, reported the same pattern.

As the patients arrived by means other than ambulances, hospital personnel were faced with unusual circumstances: catastrophically wounded patients arrived with no prehospital treatment. The volume of victims, varying degrees of injuries, and uncontrolled nature of the conditions created a secondary MCI at the hospitals themselves.[256] At the time of the Las Vegas shooting, Sunrise Hospital and Medical Center had an emergency room staffed with four emergency physicians, one trauma surgeon, and one trauma resident.[257] This small team took on the monumental and unconventional task of mass triage while also treating patients.[258]

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In an optimal response to an MCI, hospitals are notified early in the response so that staff, patients, equipment, and supplies can be adjusted to prepare for the inundation of victims. MCI planning assumes that hospitals will be provided with this time, usually because field providers alert them to incoming transports.[259] In many MCIs, however, because so many patients self-evacuate prior to EMS arrival and control of the scene, the arrival of the patients themselves is the first notice to the hospitals, leaving hospital staff no time to prepare.[260] A study by the Disaster Research Center shows that very few

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255 Kevin Menes, Judith Tintinalli, and Logan Plaster, "How One Las Vegas ED Saved Hundreds of Lives after the Worst Mass Shooting in U.S. History," *Emergency Physicians Monthly*, November 3, 2017, http://epmonthly.com/article/not-heroes-wear-capes-one-las-vegas-ed-saved-hundreds-lives-worst-mass-shooting-u-s-history/.

256 Federal Emergency Management Agency, *1 October After-Action Report,* 18.

257 Menes, Tintinalli, and Plaster, "One Las Vegas ED."

258 Menes, Tintinalli, and Plaster.

259 Holgersson, "Review of On-scene Management."

260 Auf der Heide, "The Importance of Evidence-Based Disaster Planning," 43.

hospitals receive this vital information in advance and are unaware that the MCI is occurring; they have no way of knowing the type of injuries, the number injured, the severity of casualties, and the count to be distributed to that particular facility.[261] This leaves hospitals minimally prepared and forced to deal with a sudden influx of patients with only the resources immediately available.[262]

Hospitals must adjust to account for the reality of immediate responder treatment and transport. Hospitals should expect to have little or no warning of the event and incoming patients.[263] Because the least serious patients arrive first, hospitals should consider reserving beds, equipment, and staff resources for the more severe patients that will likely come as EMS is able to transport.[264] All plans should include an assumption that the initial portions of the event will be handled only by in-house resources, as on-call resources will take time to deploy.[265] Since most victims arrive within thirty minutes, and nearly all within ninety minutes, only the resources immediately available will have an impact on surge.[266] Hospitals should plan on using other areas of the facility, such as cafeterias, waiting rooms, conference rooms, and parking garages, to conduct patient care.[267] Capacity should be maximized by discharging patients, transferring patients to urgent care or surrounding hospitals, and cancelling elective surgeries. These techniques greatly increased capacity following the World Trade Center attack on 9/11.[268]

Many promising practices for MCI management, including accounting for immediate responder participation, have emerged from Israeli, where frequent terror

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261 Auf der Heide, 43.

262 Auf der Heide, 43.

263 Auf der Heide, 43.

264 Auf der Heide, 44.

265 Auf der Heide, 37.

266 Auf der Heide, 43.

267 David French and Nick Sloan, "Innovative Approaches to Management of Mass Casualty Incidents," *Journal of Emergency Management* 42, no. 9 (2017), https://www.jems.com/articles/print/volume-42/issue-9/features/innovative-approaches-to-management-of-mass-casualty-incidents.html.

268 Simon and Teperman. "The World Trade Center Attack," 318; Simoneaux,. "After Las Vegas Shooting."

attacks have forced the country to adapt to the demands of medical surge.[269] Israel requires all hospital facilities to maintain the capability to immediately surge to 20 percent of the hospital's normal capacity.[270] Israeli practices show that hospitals need to adjust from providing traditional operations to serving as casualty clearing stations, which is critical with immediate responder action, as no formal triage has occurred before the victims arrive at the hospital. Upon recognition of an MCI, centralized management that oversees both the hospitals and prehospital system is established.[271] Individual nurses are assigned to specific functional tasks, and those tasks remain their only responsibility throughout the duration of the event. Tasks might include emergency room patient evacuation, personnel recruitment, organization of emergency equipment, and quality assurance.[272] An experienced senior surgeon is assigned to triage all patients before they enter the hospital.[273] This system recognizes that hospitals are the first location where impactful control can be established, accounting for the helpful but uncontrolled role of immediate responders.

The nontraditional nature of MCIs calls for unorthodox responses, such as dispatching public safety personnel to the hospitals. Perhaps most challenging to hospitals is the arrival of patients who have self-transported and have received no prehospital care. Hospitals must consider the need to move patients from vehicles other than ambulances and utilize personnel who are more familiar with patient stabilization and movement, such as fire and rescue personnel.[274] Resources once intended to provide vast amounts of emergency equipment on the scene, such as MCI trucks and trailers, may be better utilized if deployed to hospitals, where surge supplies, equipment, and medications are not always

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269 Hanna Admi et al., "Management of Mass Casualty Events: The Israeli Experience," *Journal of Nursing Scholarship* 43, no. 2 (June 2011): 213, http://dx.doi.org/10.1111/j.1547-5069.2011.01390.x.

270 Bruria Adini and Kobi Peleg, "On Constant Alert: Lessons to Be Learned from Israel's Emergency Response to Mass-Casualty Terrorism Incidents," *Health Affairs* 32, no. 12 (December 1, 2013): 2180, https://doi.org/10.1377/hlthaff.2013.0956.

271 Admi et al., "Management of Mass Casualty Events," 213.

272 Admi et al., 216.

273 Admi et al., 216.

274 Federal Emergency Management Agency, *1 October After-Action Report*, 26.

immediately accessible.[275] Law enforcement should respond to provide scene security, information flow, and target hardening, as they did in Orlando and Las Vegas.[276] Police should also establish perimeters around the facility to control access, stemming the flow of friends, family members, and media that can overrun the already crowded hospital.[277] Law enforcement and public works should consider blocking roads to provide a dedicated corridor for patient transports and the arrival of surge staffing.[278] These actions and adjustments allow for management of immediate responder interaction in an arena that is normally reserved for trained professionals.

The on-scene impacts of immediate responder intervention, both positive and negative, monopolize much of the focus on the topic of immediate responders. It is important to note that those early on-scene actions by immediate responders create unique and overwhelming conditions for hospitals as well. The local hospitals may be even more stressed than the responders at the scene.[279] The disproportionate distribution to the closest facilities magnifies these challenges and has been said to create a secondary MCI at the hospital itself.[280] As throughput at these facilities lags, the negative effects cascade and cause inefficient management of the patients from the scene. While the influx and initial distribution of patients is out of the control of any one hospital, there are steps that have proven to minimize the impact, such as redistributing patients throughout the health care system once they arrive at the first hospital.

C. SUMMARY

Immediate responders are an important component of MCI response. With immediate access to the scene, they fill the response gap between the onset of the event

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[275] Cathie Anderson, "ER Surgeon Recalls Lessons Learned in Las Vegas Shooting," EMS1, September 30, 2018, https://www.ems1.com/mass-casualty-incidents-mci/articles/392410048-ER-surgeon-recalls-lessons-learned-in-Las-Vegas-shooting/.

[276] Federal Emergency Management Agency, *1 October After-Action Report*, 26.

[277] Federal Emergency Management Agency, 26.

[278] Auf der Heide, "The Importance of Evidence-Based Disaster Planning," 43.

[279] Auf der Heide, 36.

[280] Admi et al., "Management of Mass Casualty Events," 213.

and when EMS arrives. During this time, they provide immediate life-saving interventions, remove people from active threats, and transport victims to hospitals. However, the immediate responders also produce unintentional challenges, including overwhelming the closest hospital, misdirecting their medical efforts, and failing to notify hospitals of incoming patients. As emergency response systems look to leverage immediate responders, they will need to manage these bystanders through new approaches to incident management.

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V. FROM COMMAND AND CONTROL TO ANALYSIS AND ADAPTATION

Many of the structures used by public safety organizations for incident management are derived from military applications. The hierarchical command-and-control model was adopted to identify clear objectives, lines of authority, and divisions of labor. While these constructs drive routine emergency response and are effective for small-scale incidents, they are incompatible with MCIs, especially those that include immediate responder emergence, which elevates the complexity of the event. Successful management of the emergency response to such an event will require a diversion from the traditional applications, and adoption of a method that takes into account the challenges of complexity and uncertainty. Recent MCIs call for a new paradigm to incident management—one that incorporates sensemaking, probing, analysis, responsiveness, and agility.

A. COMMAND-AND-CONTROL INCIDENT MANAGEMENT

One reason immediate responder emergence may be omitted from planning is because the structure does not align with the emergency management doctrine that has been promoted since the civil defense era.[281] The early civil defense directors, the predecessors of the modern emergency manager, were usually military veterans.[282] They pushed for a paramilitary style of organizing responses to emergencies, treating the disaster as the enemy. In an attempt to address the chaos brought about by disasters and to orchestrate the resources needed to respond, command and control became the emphasis. Standard operating procedures were developed to prescript responses, removing as much ambiguity as possible and pre-assigning roles and responsibilities. The approach included defined objectives, division of labor, reporting and command structures, and policies.[283] The plans mimicked how government functions under routine circumstances, applying such practices to emergency scenarios.

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[281] Drabek and McEntire, "Emergent Phenomena and the Sociology of Disaster."

[282] Britton, "Organized Behavior in Disaster."

[283] Drabek and McEntire, "Emergent Phenomena and the Sociology of Disaster."

Today, that same approach remains. Rigid, bureaucratic organizations exist at all levels of the government, and emergency response is no exception. From public safety to emergency management, command and control is the guiding principle. Thomas Drabek and David McEntire outline some of the planning assumptions that support the command-and-control model, including:

- If a bureaucratic response is enacted, no other response will happen simultaneously.
- If provided with a set of policies and procedures that address all contingencies, the outcome of the response is predictable and controllable.
- Disasters demand a strong paramilitary leadership style with a hierarchy for reporting and communicating directives.
- Victims and bystanders will panic and become irrational, breaking down society and becoming counter-productive to effective response.
- Civilians are uninterested or unwilling to respond to an emergency; they will be passive victims that require professional assistance.[284]

Repeated studies have disproved these assumptions.[285] However, this line of thinking remains, and immediate responder emergence does not fit into such a model. Many public safety plans therefore call for bystanders to be removed from the scene lest they impede the flow of professional rescuers and perpetuate the chaos of the incident. The immediate responder is treated as a problem rather than a resource to be leveraged.

The command-and-control model has numerous flaws.[286] The approach disregards actual human behavior that occurs after a disaster, which is impossible to control. Responders find themselves trying to apply constructs, policies, and approaches that are incompatible with the behavior of the victims and public. The centralized decision-making often misses the nuances of a complex and evolving system. The delayed feedback loop does not have the flexibility needed to adjust for changing demands or poor performance.

It is understandable that public safety agencies wish to develop policies and procedures that create a uniform approach to the same threat, such as a single-family house

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[284] Drabek and McEntire.

[285] Dynes, "Community Emergency Planning."

[286] Dynes.

fire or motor vehicle accident; because such events have few variables, policies can address likely contingencies. Set tactics and training allow a diverse, large workforce to meet mission objectives while minimizing safety hazards. There are minimal variables to these events, so all contingencies can be addressed through policy. By enacting command-and-control, the outcome can be manipulated, and is predictable and consistent.

Disasters, however, by their very nature, are not conducive to static approaches. Organizations are inherently less adaptive to disasters than individuals and small groups are.[287] With the command-and-control approach, much like with medical treatment, response agencies attempt to address MCIs as a matter of quantity rather than quality; if a method works for a small-scale emergency with a small number of patients, planners presume that the same method will work for heavier demands as well. However, the policies, structures, and tactics used for a motor vehicle accident cannot be scaled to account for the novel complexities of an unpredictable, unstable MCI. MCIs are a challenge of quality, not quantity. The overall approach must be adjusted to deal with the qualitative differences.

Similarly, as the magnitude of an event grows, so too will the number of immediate and professional responders. With the high volume of patients, immediate responders, and public safety personnel involved in an MCI, overall organizational control and coordination becomes less attainable.[288] That said, the regimented coordination that is typically sought during the early stages of smaller emergencies is not realistic for effective management of large MCIs.[289] Response agencies must simply become more comfortable with the period of apparent operational chaos that ensues between the onset of the incident and when traditional incident management structures can and should be established.[290] It is during this time that critical and quick work is being performed to stabilize and transport patients, and disruption of that for the sake of a forced semblance of command and control would be detrimental. MCIs require a unique approach that is dynamic, innovative, unencumbered by bureaucracy,

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287 Quarantelli, "Organizational Behavior in Disasters."

288 Quarantelli.

289 Quarantelli.

290 Cynthia E. Renaud, "Making Sense in the Edge of Chaos: A Framework for Effective Initial Response Efforts to Large-Scale Incidents" (master's thesis, Naval Postgraduate School, 2010).

and that embraces the evolving nature of the event, all of which is accounted for in an emergent approach.

B. ORDER THROUGH CHAOS

In her work "Making Sense in the Edge of Chaos: A Framework for Effective Initial Response Efforts to Large- Scale Incidents," Cynthia Renaud recognizes the challenges of using the command-and-control model during MCIs.[291] She explains that it takes time and resources to apply NIMS, which was developed after 9/11 as a framework for incident command. During this time, most public safety personnel, victims, and immediate responders will act independently, and orders issued by an incident commander will be ineffective. This chaos is normal, especially in large-scale events, and there is no way to stop it. Proper management of these incidents requires that commanders accept the chaos, manipulate the variables, and work toward a more controlled atmosphere that better lends itself to traditional NIMS application.

Renaud likens this period to a theory in molecular biology known as the *edge of chaos.*[292] She explains that on the edge of every cell, agents interact with one another, within their environment, without any higher order or direction. This looks like chaos and dysfunction as the agents try to instill some sort of order. The type of order that arises from this chaos determines if the cell ultimately lives or dies. Renaud analogizes this to emergency incidents, where the impact and nature of the incident occurs on the outside edge of the normal system of society. The event disrupts order and causes chaos while the members of the complex system begin to interact with each other and their environment in new, chaotic ways. The book *Surfing the Edge of Chaos* explains that "in the face of threat, or when galvanized by a compelling opportunity, living things move toward the edge of chaos. This condition evokes higher levels of mutation and experimentation, and fresh solutions are more likely to be found."[293] Following an MCI, civilians naturally, and perhaps unknowingly, move to this

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[291] Renaud.

[292] Renaud.

[293] Richard Pascale, Mark Millemann, and Linda Gioja, *Surfing the Edge of Chaos: The Laws of Nature and the New Laws of Business*, 1st ed. (New York, NY: Texere, 2000).

edge of chaos. The responders must allow the chaos to play out, but also must manipulate it to facilitate and shape the type of order that emerges. This requires an incremental approach between chaos and order, though the current command and control edicts suggest an immediate transition between the two.

C. INCIDENT LEADERSHIP THROUGH THE CYNEFIN FRAMEWORK

The phases of an emergency and the transitions between them can be examined through the lens of the Cynefin framework.[294] The framework, developed by David Snowden in 1999 as a knowledge management tool for IBM, is a means for understanding reality in novel systems. Rather than a classification or categorization tool, it uses multiple ontological inputs, including the elements and relationships within the system, to analyze the situation and understand it in one of five domains: *disorder, obvious, complicated, complex, and chaotic* (variations of these names, which have emerged as Snowden has refined the framework, are included parenthetically in the introduction to each domain).[295] This sensemaking tool allows leaders to understand the domain in which a system fits, thereby guiding them to respond appropriately for that type of system. Snowden explains the framework is one of sensemaking, which is "how we make sense of the world so we can act in it."[296]

According to Snowden, all problems and scenarios initially fall within the *disorder* (also known as *aporia* or *confused*) domain when it is first approached. Disorder is when the decision-maker is not sure into which domain the problem falls. Every incident and situation is approached under this categorization at first. However, decisions will be delayed, hampered, or incorrect if leaders cannot quickly move into one of the four main domains. Decision-makers who find themselves stuck in the disorder category choose courses of action that are comfortable or familiar. That natural response to rely on heuristics and cues can often lead to improper action that can, at best, prolong disorder and, at worst, steer an emergency

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294 CognitiveEdge, "The Cynefin Framework," YouTube video, uploaded July 11, 2010, https://www.youtube.com/watch?v=N7oz366X0-8.

295 CognitiveEdge.

296 "Making Sense of Problems with the Cynefin Framework," TXM Lean Solutions, February 26, 2017, https://txm.com/making-sense-problems-cynefin-framework/.

incident in the wrong direction. Therefore, it is critical for the incident commander to quickly engage in sensemaking to understand with which of the four primary domains the problem best aligns.

The *obvious* (also known as *simple*, *clear*, or *known*) domain in the Cynefin framework describes when the circumstances and options are clear.[297] There is little novelty and complexity in this domain, which makes it appropriate for a routine emergency response, such as a motor vehicle accident, where standing roles and expectations can apply. Standard operating procedures are designed for this type of event, as it is predictable and managed simply, which makes an *obvious* situation highly compatible with ICS.

The *complicated* (also known as *knowable*) domain allows for several different courses of actions, all of which would be acceptable.[298] While not necessarily novel, there are many parts and relationships between them, making it difficult to predict cause and effect. Decision-makers must analyze the situation and deliberate among options to determine the most appropriate course of action. A typical house fire would fall in this realm, as there are several methods and tactics to extinguish the fire. The incident commander must weigh the options to decide which approach, or which combination of approaches, is best. Traditional ICS works well in this environment as well.

The next two domains are the most challenging for response agencies, in part because the normal ICS approach of management is inadequate. *Complex* situations are less predictable and do not readily lend themselves to a single correct solution.[299] In the complex domain, it is best to concentrate less on controlling the situation and more on patiently observing and looking for patterns. Solutions must be tested, and many will fail, informing future actions. Long-term responses, such as the response to the 2020 coronavirus pandemic, fall into this category.

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297 CognitiveEdge, "The Cynefin Framework."

298 CognitiveEdge.

299 CognitiveEdge.

Chaotic environments are similar to complex ones, in that novelty, complexity, and changing conditions produce no clear courses of action.[300] While situations in the *complex* domain allow time to probe for information, *chaotic* environments do not. In the *chaotic* domain, action of any type is needed. There should be an immediate feedback loop to evaluate the responses and adjust accordingly during this time. The early phases immediately following a violent MCI or similar disasters fall into the chaotic domain. The sudden shift in dynamics, immediate wounding of dozens or hundreds of people, ongoing threat, imbalance of resources, and disruption of the group's understanding of the circumstances all contribute to abrupt chaos.

From the incident commander perspective, MCIs, especially active or intentional MCIs, such as those seen at the World Trade Center attacks, Madrid bombings, Boston bombings, Pulse Nightclub shooting, and the Route 91 Harvest Festival shooting remain in the chaotic domain for quite some time. During this period many individuals and organizations will emerge to develop—or become—the solution. This is the type of environment where immediate responders emerge and take action to help one another. Incident commanders have no influence over these emergent groups of bystanders—which fall outside the normal scope of command and control—and a sense of disorder follows. The overwhelming scope of the event itself, as well as the number and nature of casualties, further contribute to challenges in regaining control, which can perpetuate the chaos. With little ability to influence the chaotic domain, incident commanders can feel as though the incident is beyond their control.

The chaotic components following an MCI are challenging and will draw attention, especially to the incident commander who is concentrating on bringing about order. As demanding and seemingly overwhelming as these chaotic elements may be, however, the broader MCI is probably not entirely chaotic. In fact, the MCI response is likely so elaborate and diverse that each of the four primary domains align with one or more of the elements. In other words, some chaotic elements do not force the entire incident to become chaotic and disorderly. Instead, the incident is likely in all domains at once. Understanding where each

[300] CognitiveEdge.

element aligns, at least temporarily, allows the incident commander to take appropriate actions, when feasible, to lead the incident toward resolution.

Immediate responder emergence and general bystander action will likely be in the chaotic domain during the early phases of MCI response. Each person—survivors, rescuers, and bystanders—will be conducting their own sensemaking, which will lead to a variety of responses. The complexity within and between the emerging groups will create a novel environment that is subjected to the quickly changing conditions. During this time, those impacted by the MCI will adapt to find solutions. Sensing the critical nature of the catastrophic injuries and ongoing threats, the emerging groups will take courses of action without probing for information. Incident commanders will be unable to bring order to this chaos. However, because the emergent group is probably effective in treating and moving patients, at least until more professional help arrives, they should not be dissuaded from doing so. While allowing prompt action of immediate responders and public safety personnel without concentrating on regaining immediate control, the incident commander monitors actions, encourages helpful behavior, and modifies or eliminates unhelpful behavior. In general, unless there is danger to immediate responders or others on the scene, the incident commander should not intervene, but should monitor the situation to determine if emergent groups and behavior are benefiting the response. During this time, public safety personnel and immediate responders may act independently, but they are working toward the desired outcome: evacuation, and patient care and transport. The professional rescuers will likely be operating in a more controlled fashion—or trying to, filling their intended, prescribed roles.

Meanwhile, other facets of the incident may align with more orderly domains of the Cynefin framework. Unknown geographic boundaries of an MCI, such as an airliner crash site, would fall within the complex domain. There are knowable boundaries of the scene, but they are not known immediately upon arrival. In the early stages, it will be unclear exactly what is needed where, as it will be difficult to thoroughly saturate the area to gain the necessary level of analysis. Other deciding factors, such as a means of access to the site or determining if there is an ongoing threat, may remain unclear for some time. Different geographic areas of the incident, such as those where there is active fire, may need completely different response approaches. The incident commander can begin taking assertive actions by

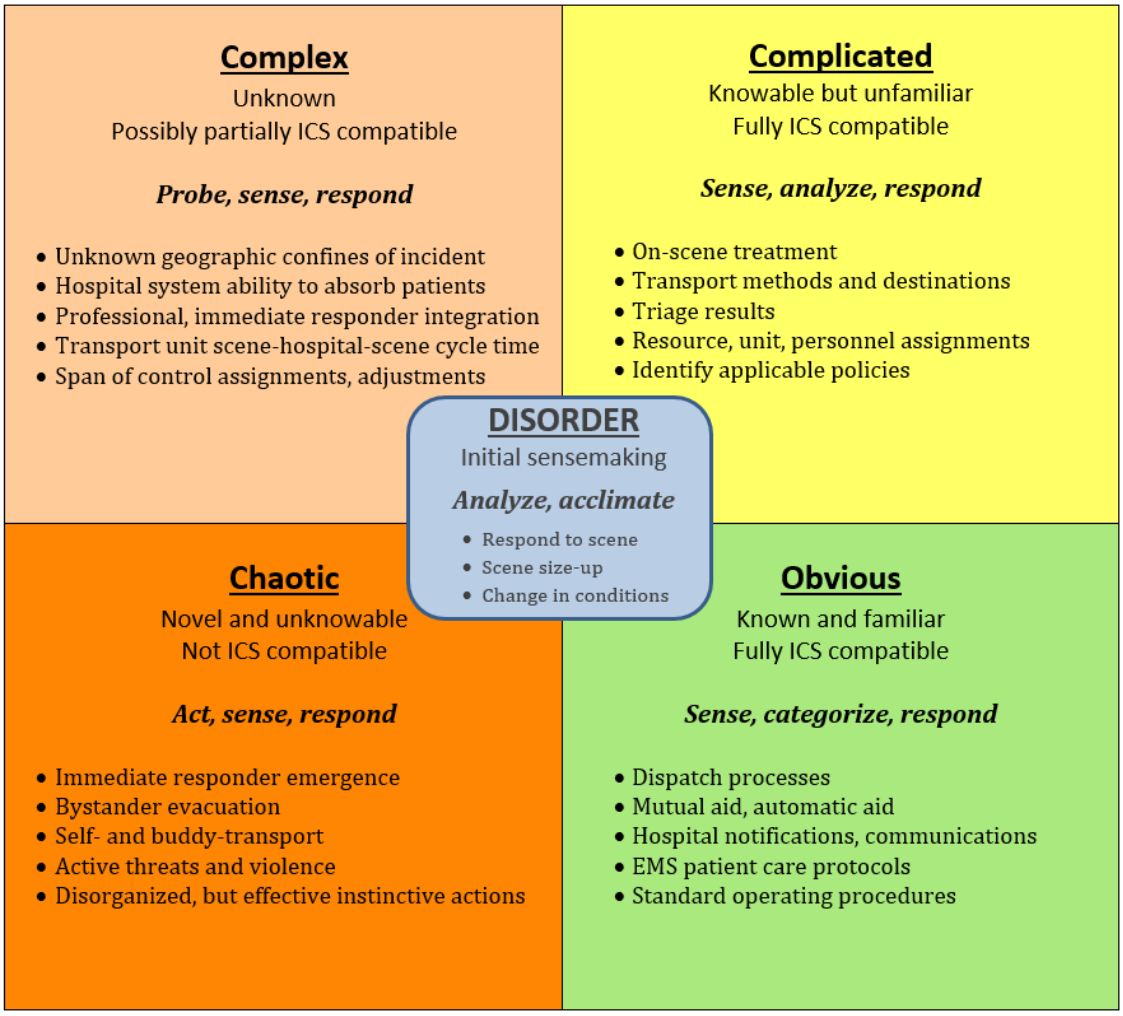
sending units to different portions of the scene, with the goal of advancing the overall strategic objectives of the incident response. As responders arrive from different directions, encounter patients, and report observations, the incident commander will be probing as part of further sensemaking. The incident commander should be aware of, and consistently inquire about, the findings of units and personnel throughout the scene, recognizing successes and failures—capitalizing on the former while abandoning the latter.

The on-scene treatment of victims by professional responders falls into the complicated domain. The individual providers will have discretion over which patients are treated on the scene, in what order, and in what way, versus choosing to immediately transport the patient to the hospital. The varying conditions of the patients dictate that no single solution is the correct one, allowing for a more nuanced approach, entrusted to trained medical providers. The incident commander should not try to exert control over specific patient treatment decisions, but observe the global patterns that the treatment modalities are producing. For example, if too many providers shift their focus to intense treatment of a small group of patients, leaving others unattended, the incident commander should recognize this broader impact and use this knowledge to inform future decisions.

Many facets of the seemingly chaotic event will actually fall within the obvious domain—for example, the locating and dispatching of response units during an MCI. In most areas, a well-established public safety answering point is in place to receive 911 calls and direct emergency resources. Following established policies and procedures while sourcing units according to dispatch patterns and mutual aid agreements, dispatchers can consistently and promptly provide the assets the incident commander requests. These routine portions that lend themselves to standing roles and expectations cannot be underestimated, as they usually represent the underpinnings of the overall response, even though they do not require much intervention from the incident commander.

The challenge to the incident commander is evaluating all the components of the MCI using the Cynefin framework. By parsing out different aspects and assigning them the appropriate domains, the incident commander can begin to understand the status of the event and its components. This allows for distinction between areas of chaos and simplicity, driving incident commanders to acknowledge the elements they can influence. Further, by distilling

the complex incident down to manageable portions, management of the MCI may be less overwhelming to the incident commander. Figure 1 shows how multiple aspects of an MCI may fall into different domains at the same time, each signaling a specific type of action.



Parsing out elements into specific domains allows the incident commander to understand which actions are most appropriate. Consistent sensemaking and reevaluation is necessary, as elements will move between domains.

Figure 1. Example of Possible MCI Element Alignment with Cynefin Framework Domains

Incident commanders have an advantage that allows for sensemaking: a trained force of professional rescuers that will fill their normal roles and expectations, such as providing patient care, without intervening direction. These personnel will likely move to

hierarchical structures, such as ICS, within their limited tasking or geographic region. These subsets of ICS throughout the scene are to be expected, but it must be recognized that true ICS, which encompasses the entire incident and the resources devoted thereto, will not be established until other aspects reach a state that is compatible with ICS. Nonetheless, the places where this organization can be established will be beneficial to the overall incident objectives. Localized ICS provides order for that specific group or function, permits professional responders to fill the roles to which they are accustomed, and sets the foundation for outward growth of this structure when other aspects move to a more ICS-compatible state.

Cynefin is not a categorization model; through the sensemaking of the framework, however, incident commanders can align the components of the incident with specific domains, as would be expected. The purpose of this alignment, and the value of the framework, is that it drives the immediate action. The domain alignment directs the incident command toward the appropriate type of response. For example, once the incident commander classifies immediate responder emergence within the chaotic domain, he or she will know that trying to influence order or manipulate the effort would be futile. Instead, the incident commander allows the helping behavior to continue while concentrating on the aspects of incident that demand his or her attention and will benefit from assertive action, such as those elements in the complex and complicated domains.

The novel, complex MCI environment is ever-evolving. Managing the incident requires constant vigilance and sensemaking. Elements will move between domains as the incident changes, prompting different action. Placing an element within a domain following the sensemaking process is meant to drive immediate, limited action. As soon as that action commences, the incident commander should reengage in sensemaking to reevaluate the element, especially in light of the action just instigated.

As the incident progresses, ongoing sensemaking will likely show more elements moving to the obvious domain. The on-scene imbalance between resources and demand has shifted in favor of the resources as more personnel and units arrive and fewer patients remain on the scene. Command personnel have arrived who can assume functional or geographic assignments, which are now at a scale and level of simplicity that more closely

align with standard operating procedures and past experience. Immediate responders have either moved to the hospital with patients they have transported, dispersed, or been absorbed into other operational constructs under the NIMS structure. This represents the stabilization of the event, signaling a shift toward resolution and demobilization. When the MCI reaches this point, all the components understand their roles and responsibilities and carry them out in an orderly fashion according to standard operating procedures that are practiced and refined by the emergency response personnel. In the pattern of emergent groups described by Stallings and Quarantelli, the immediate responders will likely move into a subordinate supplemental role, or disband altogether, now that the response agencies have been able to meet the demand and assert control.[301]

D. SUMMARY

Hierarchical command and control, an incident management tool derived from the military, has been used by public safety agencies since the civil defense era. This approach, driven by clear lines of authority and divisions of labor, has been useful for small-scale incidents to which these agencies respond. Disasters, however, such as intentional MCIs, include levels of complexity, novelty, and uncertainty that are incompatible with the rigid bureaucracy of command and control. Successful incident management of MCIs can be achieved through sensemaking, such as that offered through the Cynefin framework. Through this process of constantly evaluating the evolving incident and elements, the leader can direct actions that are appropriate and effective for the nuanced portions of the incident response. Leaders who will manage these incidents must be taught to perform sensemaking, embrace uncertainty, and lead these complex incidents toward resolution.

[301] Stallings and Quarantelli, "Emergent Citizen Groups and Emergency Management."

VI. DEVELOPING THE INCIDENT COMMANDER FOR THE MODERN MCI

While the traditional approach to command and control must be adjusted to account for the unique conditions of MCI response, the need for strong leadership during these events is still critical. Incident commanders may not truly command all aspects of an incident, but under their direction the event can move to a desirable resolution. Recognizing that the responsibility to lead the response still belongs to the incident commander, the term will continue to be used in this thesis.

MCIs that involve active violence and impact hundreds of victims, such as those presented within this thesis, are not immediately compatible with NIMS or any other traditional incident command structure, especially during the early stages of the response. These situations are novel, complex, and constantly changing—all characteristics that undermine typical ICS. This presents an overwhelming and frustrating tasking for incident commanders, who are typically charged with applying a fixed ICS structure to a familiar event with known components, including the personnel acting in the response operation. During an MCI, the incident commander is now faced with novel complexity unlike in any other routine incident to which they respond. Incident commanders find themselves battling the elements of the complex system to establish an incident management system; during this time, the response continues without regard for the incident commander. As the event becomes more complex or the number of patients increases, the number of immediate responders taking action will also increase, making command and control even less attainable. The incident commander is fighting a losing battle for order when the focus should instead be on finding and reaching solutions.

A. BUSINESS AS USUAL DOES NOT WORK

MCI management is unconducive to a typical command-and-control approach, as the quality of the emergency, not just the quantity of patients, is far different than in routine incidents. Responders are operating in areas where threats of violence still exist, patients present with unfamiliar and catastrophic wound patterns, nontraditional partners are

involved, the entire health care system is immediately overwhelmed, and immediate responders are heavily engaged in treatment and transport. These circumstances do not allow for scaling of routine command paradigms, as those structures do not account for the unique qualitative challenges. As such, the incident commander cannot follow the traditional approach of superimposing structures, roles, and responsibilities against resources. A playbook that would normally prove useful during a routine emergency is immediately rendered useless in this environment. This situation demands agility and responsiveness to the dynamic circumstances.

Fire, rescue, EMS, and police incident commanders, who respond to and manage these MCIs, have long been taught that the gold standard for incident management is ICS and NIMS. Following the tradition of command and control, ICS and NIMS are incorporated into response plans, including those for MCIs. This approach, like other command-and-control models, attempts to plan for every contingency and have structures and hierarchies in place to address a known problem with a specific set of resources. The system does allow for some adaptability, depending on the scale and scope of the event, but it remains rigid in its bureaucracy and assumption of authority over the components of the system. ICS has been an effective tool to safely and consistently manage a routine event with expected behaviors, workforces, and outcomes. It allows responders and commanders alike to operate under standard policies and procedures and allows a uniform approach by all parties, leading to a concerted effort and predictable outcome.

Incident commanders have been led to believe that the use of NIMS and ICS will provide order, which will allow for a controlled and predictable response operation. They use this approach on all of their routine incidents, creating proficiency through repetition. As each event passes, incident commanders develop more experience and refine their skills in accordance with NIMS and ICS principles. It is therefore presumed that scaling this structure to the increased demand of an MCI would be effective. However, this assumption fails to acknowledge the qualitative characteristics of an MCI that make it unique and incompatible with ICS and NIMS. Incident commanders who have mastered the constructs and administration of ICS and NIMS have a false sense of security if they assume these same approaches will work in MCIs.

In the case of incidents that involve immediate responder emergence, such as large MCIs, Dick Buck, Joseph Trainor, and Benigno Aguirre believe that "many social demands produced during disasters are too complex and unexpected to be handled by ICS. The command and control model does not currently, and given the social complexity, never will work for all phases of disaster operations."[302] The rigid paramilitary approach works for expected events with predictable outcomes, but is too outdated, inflexible, and cumbersome to be effective during MCIs. The highly bureaucratic form has been shown to take entirely too much time and requires too many resources to be stood up for an event of the magnitude of an MCI, making the structures impossible to establish during the early phases of disaster response. NIMS and ICS do not account for the edge of chaos or chaotic domain in which MCIs initially operate.[303] The MCI does not allow for easy transition to the obvious domain, which is required to apply the heuristics and constructs of ICS. Immediate responders, a workforce that by its very nature does not fall within the scope of the commander's control, further complicate the situation and confound commanders attempting to apply incompatible frameworks. Because of this, the structure that incident commanders have been taught to apply to every incident simply will not work during the immediate response to an MCI.

Incident commanders need to understand that as long as NIMS and ICS do not address the initial chaos period of an MCI, these tools should be relegated to later phases. They must make use of all of the available resources in the complex system, orchestrate them to work together in whatever fashion is most effective, and drive the situation toward a resolution. If they expect to immediately implement NIMS and ICS, they do a disservice to themselves, responders, and the victims, as doing so detracts from the commander's ability to exploit emergence to allow for a more natural and expedient resolution. The plan should call for NIMS and full ICS only once the environment, components, and circumstances allow so, which may be significantly later than what is currently expected.

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302 Dick Buck, Joseph Trainor, and Benigno Aguirre, "A Critical Evaluation of the Incident Command System and NIMS," *Journal of Homeland Security and Emergency Management* 3, no. 3 (2006): 1–1, https://doi.org/10.2202/1547-7355.1252.

303 Renaud, "Making Sense in the Edge of Chaos."

Only once the situation is well into the complex, complicated, or obvious domains can either construct be effectively applied.

B. DEVELOPING NEW SKILLS FOR MANAGEMENT OF MCIS

To effectively manage immediate responder emergence and its broader impacts, incident commanders need to be equipped with a new set of skills. Since the period of chaos and intense complexity is not accounted for through NIMS and ICS, commanders are ill-equipped to lead the response efforts. Currently, there is no standardized training or education provided to incident commanders that teaches them how to work through these unique circumstances. The incident commander must be educated on how to use sensemaking tools and operate in chaotic environments to bring about resolution.

A survey of emergency response leadership showed that many continue to believe in misconceptions, such as disaster syndrome, bystander panic, and social discord.[304] In this sense, it is understandable why commanders continue to pursue order through the command-and-control approach. To alleviate this, immediate responder emergence, and accurate expectations regarding human behavior, must be accounted for within the incident commander's plans and expectations.

A reasonable start to developing leaders for this new paradigm is to teach them about accurate planning assumptions, correcting the now-debunked beliefs about bystander inaction, panic, and social breakdown. From there, incident commanders can develop an understanding of the psychology and sociology of victims and bystanders, which will in turn make them more capable of responding to the human behavior that will occur during MCIs. This will also help them understand why the commonly used command-and-control model is incongruent with human behavior and, when the two are in conflict, human behavior will prevail. When accounting for immediate responder action, incident commanders should understand the sociological normative for people—such as helping behavior, societal norms, and social order—as they will not differ much during times of

[304] Dennis Wenger, Thomas James, and Charles Faupel, *Disaster Beliefs and Emergency Planning* (College Station: Hazard Reduction and Recovery Center, Texas A&M University, 1985).

emergency.[305] Rarely during times of stress can someone effectively be commanded to act in a way that is unnatural or novel. Therefore, it is more effective to plan for what people will naturally do, rather than expect them to conform to new, unfamiliar structures. If incident commanders take this to heart, they will move from commanding into leading, guiding the event toward resolution.

The incident commander and field personnel must understand the sudden need for emergency response personnel to develop linkages with nontraditional partner agencies and groups, including immediate responders. Professional responders should understand that they will be forced to perform new or seldom-used tactics to meet an extraordinary demand. Individual immediate responders, and groups of immediate responders, will be at the scene on arrival, performing various functions. The immediate responders will continue engaging in helping behavior and will not be easily incorporated into rescue personnel's existing command structures. When the coordination among the groups seems nonexistent or tenuous, professional responders will become uncomfortable. Public safety organizations will lose much of their autonomy to immediate responders during the organized chaos. Incident commanders should remind personnel that routine command structures are not to be expected in MCIs, and the appearance of poor coordination does not mean that the response is ineffective.

The professional responders serving under the leadership of the incident commander will also need to become familiar with the new approach to incident management. Just as the incident commander has become accustomed to the ICS model that functions during routine emergencies, so too have the other response personnel. These personnel will need to understand that the incident does not allow for routine management. Many of these responders will not receive explicit direction the incident commander but will, by default, conduct their own sensemaking and perform their duties according to standard operating procedures and protocols. Perhaps most importantly, these responders will serve as sensors that provide valuable information to help the incident commander make sense of the situation.

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[305] Britton, "Organized Behavior in Disaster."

Certain areas, functional or geographical, will lend themselves to traditional ICS. Therefore, responders will be expected to organize at this more tactical level, realizing they are operating within a complex system that has varying degrees of standard ICS applied during the initial chaos. The unit leaders and supervisors who usually fill general staff roles in the ICS structure will operate in the same fashion, adjusting their approach to the evolving circumstances. In this way, ICS may be established from a bottom-up method rather than the typical top-down. It may also form in decentralized segments, eventually being centralized by the incident commander when the circumstances allow for more order and control.

C. APPLYING THE NEW SKILLS AND KNOWLEDGE

Incident commanders must understand complexity, sensemaking, emergence, and the interplay of the countless other variables that contribute to an event of this magnitude. Rather than merely trying to impose scripted responses to specific event types, incident commanders should be properly educated to process an event of any nature and magnitude, then develop the means to achieve the strategic goals.[306] The incident commander must acknowledge the edge of chaos during which the initial phases of the MCI will take place. Responders should be reassured that this is normal and to be expected, and be comfortable operating in this environment. Commanders and first responders alike should allow the chaos to play out, paying close attention to successes and failures in their efforts.

Incident commanders must also be able to accurately determine which Cynefin framework domain applies to each aspect of the incident. Commanders should be taught techniques to guide the sensemaking process and subsequent actions that will allow the leader to progress the incident towards resolution. They also must commit to constantly evaluating the efficacy of actions and performing ongoing assessments of each aspect, as these will evolve in the dynamic complex environment. This will allow the incident to be controlled gradually, but more effectively, while not impeding otherwise positive behavior

306 Cynthia Renaud, "The Missing Piece of NIMS: Teaching Incident Commanders How to Function in the Edge of Chaos," *Homeland Security Affairs* 8, no. 1 (2012), http://search.proquest.com/docview/1266358726/?pq-origsite=primo.

and outcomes. While processing the event and implementing the most meaningful solutions, the commander can still use NIMS for perhaps its more effective contribution to incident management: common language and resource typing.

Incident commanders should be taught to develop broad strategic objectives rather than emphasizing structure and order. The objectives should be flexible to account for qualitative differences, and should avoid the minutiae of tactics. These goals and objectives could include delivering all patients to the appropriate receiving facility while distributing equitably across destination hospitals. Other goals can include ensuring rescuer and immediate responder health and safety, and maintaining the integrity of the health care system, with emphasis on the evolving demands and the need to remain agile.

With these general objectives, public safety can help facilitate the various resources, including immediate responders, to most efficiently and effectively achieve the goals of the mission. A successful plan acknowledges and allows for ambiguity, complex systems of interdependence, and rapidly evolving conditions. One main objective should be leveraging and integrating all resources rather than supplanting them for the purposes of perceived order. By adjusting the approach, not only will immediate responder emergence be manageable, so too will the other facets of the event.

Immediate responder emergence, though effective in quickly caring for patients at an MCI, contributes to the initial chaos that is outside the incident commander's control. However, incident commanders must be taught to recognize the advantages of individuals and small groups that emerge, as they are more adaptive than traditional organizations, making them more suitable for the dynamics of the MCI. Emergence is more flexible, quicker, and more diffuse, which allows it to address some of the challenges of MCIs, especially in the immediate aftermath. Nonetheless, professional rescuers play an irreplaceable role in patient care and distribution of those patients throughout the hospital system, which is assured with the constructs of a formalized order. Both groups, impromptu and professional rescuers, can and should respond. Incident commanders should process and lead a response in a way that leverages all resources and guides the integrated effort of all parties to accomplish the common goals.

The novelty and complexity of a large MCI must be recognized, and incident management that coincides with its unique circumstances must be put in place. Emergency response officials need to be capable of processing complex and overwhelming events while carefully directing resources. To do so, the commander needs to recognize that many aspects of an MCI will, almost inevitably, be in the chaotic domain for an extended period of time. The official should avoid the urge to assert control over those points, instead allowing the complex system to care for itself while taking advantage of the time to make sense of the situation. Simultaneously, the incident commander can apply command and control, standard operating procedures, and rigid bureaucratic approaches to the aspects of the response and scene that fall within the obvious domain of the Cynefin framework. This hybrid approach of command and management will provide a more comprehensive and effective means of moving the entire incident toward resolution while respecting the autonomy and chaotic nature of some of the parts of the system. With this approach, over time, the commander will observe aspects as they transition to other domains of the Cynefin framework, working to bring about an effective order to emerge from the edge of chaos.

D. SUMMARY

Incident commanders have been taught that the command-and-control model of ICS and NIMS leads to ideal management of emergency response to incidents. This traditional structure is effective for most routine emergencies to which these agencies respond. However, because MCIs are complex, novel, and uncertain, they are not immediately compatible with ICS and NIMS. Immediate responders, who do not fall under the authority of the incident commander, are just one of the facets that contribute to the chaos of an MCI. Incident commanders must adapt new approaches to effectively manage an MCI. If incident commanders are taught about complexity theory and sensemaking, they will be better equipped to operate in this environment. Armed with an understanding of where each element aligns and the appropriate action for each, incident commanders can orchestrate the entire system toward a desirable resolution. Training potential immediate responders to ideally function within this system is one way to encourage helping behavior while enhancing the management and outcome.

VII. DEVELOPING A CULTURE OF HELPING BEHAVIOR

The helping behavior exhibited by immediate responders has saved lives following antagonistic MCIs. During these events, the magnitude and volume of patients immediately overwhelms the health care system, demanding force multipliers. The catastrophic injury patterns require immediate life-saving action, which can be delivered by those on the scene. As the frequency and magnitude of these events continue to grow, bystanders must be encouraged and empowered to become immediate responders, developing a culture of helping behavior. Bystander cardiopulmonary resuscitation (CPR) is one example of the public engaging in emergency response—one that can be used to inform this effort. Obstacles, such as civil liability, must be removed to encourage the public to respond. Emergency response agencies must develop a comprehensive training program to teach the public exactly when and how they should respond to MCIs in a way that complements—rather than hinders—the work of professional responders.

A. BYSTANDER CPR: A GLIMPSE INTO EMPOWERING THE PUBLIC

CPR is a simple, noninvasive method to sustain the lives of people who are in cardiac arrest. CPR's external chest compressions and respirations supply the body with oxygenated blood until the underlying cause can be corrected and the heart restarted. Usually delivered at first by bystanders, CPR fills the critical gap between the onset of the medical event and when professional rescuers arrive, keeping the patient viable until more invasive and pharmacological interventions can be performed. In the United States, bystander CPR is a case study in inculcating helping behavior among civilians.

The roots of CPR can be traced to the mid-1700s when the Paris Academy of Sciences and Dr. James Curry endorsed mouth-to-mouth resuscitation for victims of drowning. Throughout the 1800s, doctors continued to experiment, primarily on animals, with the idea of providing compressions to mimic the pumping action of the heart. Most of those experiments involved internal chest massage, where the chest was cut open to allow for direct compression of the heart muscle. By the early 1900s, doctors were working on external chest compressions. In 1960, researchers combined external chest compressions

with mouth-to-mouth ventilations to create CPR. That year, the American Heart Association began delivering CPR courses to physicians. Six years later, the National Research Council of the National Academy of Sciences established standards for teaching and performing CPR.

Over the next decade, scientists made progress toward addressing the underlying cause of most cardiac arrests, the abnormal electrical rhythms within the heart, with the use of defibrillation. This technique, which eventually used external electrodes, delivered shocks to the heart to reset the rhythm to a productive state. The push to deliver defibrillation outside of the hospital created advanced scope of practice providers—paramedics—who could analyze cardiac rhythms, deliver defibrillation, and administer drugs to revive a patient in the prehospital setting. Even with improved response time and enhanced prehospital treatment capabilities, it became apparent that the likelihood of survival for out-of-hospital cardiac arrest (OHCA) deceased exponentially with each passing minute. Organizations and communities began to teach CPR to laypeople to deliver the life-sustaining treatment until professional medical help could arrive.

It became clear that an engaged public was the critical link that gave cardiac arrest victims a fighting chance. In 1972, Dr. Leonard Cobb, a pioneer in emergency medical services, began providing civilian instruction in CPR. Within two years, the program delivered training to more than 100,000 people in the Seattle, Washington, area.[307] Institutions like the American Heart Association and the American Red Cross took the lead in canvasing the country to provide training to civilians. The outreach has lasted for decades, fueled by international studies that have found that bystander CPR can increase survival rates between 50 and 500 percent.[308] In 1981, 911 call takers in King County, Washington, began providing pre-arrival CPR instructions to all callers to prompt

307 "History of Medic One," Medic One Foundation, accessed April 30, 2020, https://www.mediconefoundation.org/about/history/.

308 "Out-of-Hospital Cardiac Arrest Survival Rates Doubled with Bystander CPR," Healio, April 1, 2019, https://www.healio.com/cardiology/arrhythmia-disorders/news/online/{c627d370-0404-4401-8cd1-5fbd8843a968}/out-of-hospital-cardiac-arrest-survival-rates-doubled-with-bystander-cpr.

bystanders to act.[309] Like previous efforts that came out of the innovative Seattle area, dispatcher-assisted telephone CPR became the standard across the United States, and is delivered still today. Since 2000, the industry has made CPR training even more accessible, offering online and self-paced courses, as well as take-home practice kits. The procedure itself has been simplified, including the elimination of rescue breaths, which were known to cause confusion and hesitation based on health concerns. Over fifty years, CPR has been ingrained as a part of American culture.

Though the concept of CPR is well-known throughout the United States, it is not a complete success story. Even after fifty years of heavy emphasis, marketing, and teaching, only 46 percent of the approximately 383,000 Americans who suffered OHCA in 2017 received bystander CPR.[310] Of those, less than 45 percent survived to the hospitals. In all, fewer than 8 percent of OHCA victims survive to return to a normal lifestyle. Surveys and focus groups have revealed that many people will perform CPR for several reasons; chief among them are:

- Inability to recognize OHCA
- Insufficient CPR training
- Concerns about liability and lawsuits for providing care
- Fear, panic, confusion, and concerns over disease transmission[311]

Many of the reasons participants said they were reluctant to perform CPR may be alleviated with enhanced training. However, despite numerous revisions to training material, respondents continue to report the same concerns. Further, less than 3 percent of the

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309 "History of CPR," American Heart Association, accessed April 30, 2020, https://cpr.heart.org/en/resources/history-of-cpr.

310 "The Importance of Bystander CPR," Harvard Health, accessed April 30, 2020, https://www.health.harvard.edu/heart-health/the-importance-of-bystander-cpr.

311 Robert Graham, Margaret A. McCoy, and Andrea M. Schultz, *The Public Experience with Cardiac Arrest, Strategies to Improve Cardiac Arrest Survival: A Time to Act* (Washington, DC: National Academies Press, 2015), https://www.ncbi.nlm.nih.gov/books/NBK321502/.

American public is trained in CPR each year.[312] With decreasing numbers of people being trained, and continued failure of those who have been trained when faced with an emergency, widespread bystander CPR continues to be a challenge in America.

The parallels between bystander CPR and immediate responder action during MCIs are clear. In fact, CPR may be the very action immediate responders would need to perform following an MCI; and the same anxieties that prevent civilians from performing CPR are likely to arise for potential immediate responders at an MCI. With the help of instructors, however, potential bystanders can learn how to recognize an emergency, how to perform rescue skills, how the law protects them when lending assistance, the reality of disease exposure, and how to minimize risk.

Following MCIs, there are often distinct injury patterns that, if left untreated, can be fatal—much like cardiac arrest. Treatment for these specific injuries should be the focus of immediate responder action, as their proximity and access allow them to offer life-saving interventions within minutes of the event. The educational program should include skills to treat external hemorrhage, airway compromise, chest penetrations, and hypothermia. The training should also be used as an opportunity to encourage desired behavior that will comport with the MCI policy. This should include personal preparedness, safety measures, how to prioritize patients, how and where to transport patients, and how to interact with professional rescuers to ensure an optimally coordinated effort.

The effort to teach CPR throughout the United States has resulted in refined approaches for instruction to the public, with a curriculum and tone that is appropriate to teach emotionally difficult material to civilians. This same approach would be useful when preparing civilians for disaster response, as laypeople tend to become uncomfortable imagining themselves as a victim of violence. CPR institutions have also experimented with numerous delivery methods, some more successful than others. Traditional CPR training is provided through a course that is several hours long, usually through a civic or educational institution. The travel and time logistics of such courses have become an obstacle, however. In response, institutions have tried methods including train-the-trainer

[312] Graham, McCoy, and Schultz.

layperson instruction, videos, online instruction, and simple poster presentations. All have been delivered at a lower cost than traditional courses and have reached a much broader audience. For the past decade, the American Heart Association has provided take-home videos along with a low-fidelity mannequin to practice compressions. This method has resulted in a surprising level of competence by students.[313] It has had the unintended consequence of being used to teach family and friends when the package was at home, teaching approximately 3.8 people each time it was taken home.[314] These teaching techniques should be considered when trying to reach the public to encourage immediate responder behavior following an MCI.

B. GOOD SAMARITAN LAWS

Good Samaritan laws are meant to protect people who help victims of emergencies from repercussions if their interventions inadvertently lead to further harm. The laws are intended to encourage immediate responder action by limiting criminal and civil exposure, which may otherwise discourage their involvement. In general, the laws apply to services rendered outside of a typical medical setting, during emergency conditions, where the provider is acting in good faith and reasonably, and there is no expectation of monetary compensation for the care.

The earliest Good Samaritan laws were designed to protect doctors and other health care workers when providing aid outside of the clinical setting. Beyond medical professionals, policymakers realized that by allowing potential rescuers to concentrate solely on providing care rather than on the legal ramifications, society would be safer.[315] The murder of Kitty Genovese in New York City in 1964, witnessed by thirty-eight people who did not intervene, catalyzed numerous efforts to stimulate immediate responder assistance, including Good Samaritan policy.[316] The push for civilian-delivered CPR

313 Graham, McCoy, and Schultz.

314 Graham, McCoy, and Schultz.

315 Brian West and Matthew Varacallo, "Good Samaritan Laws," in *StatPearls* (Treasure Island, FL: StatPearls Publishing, 2020), http://www.ncbi.nlm.nih.gov/books/NBK542176/.

316 Lurigio, "Crime Narratives."

throughout the 1960s, followed by the advent of public access automated external defibrillators (AEDs), further solidified the need for a means to protect nonmedical providers when rendering care.

In the United States, Good Samaritan laws are inconsistent across states and provide inadequate protection if the government wishes to encourage widespread action by immediate responders. Past experience domestically and abroad has shown that Good Samaritan protections, or lack thereof, do impact people's willingness to serve. If the laws are insufficient, this can undermine helping behavior throughout society. To properly prepare and encourage immediate responders, laws must be bolstered and standardized.

1. Good Samaritan Laws throughout the World

Many countries have adopted Good Samaritan laws to protect civilians with good intentions. More than twenty-eight countries have laws that compel a person to render aid, or face a fine or jail.[317] The Finnish Rescue Act requires that anyone who witnesses an emergency "make an emergency call and take rescue action without delay to the best of their abilities."[318] Germany has a similar requirement, but supports it by requiring everyone to take a first aid course before receiving a driver's license. In a 2016 German case, four individuals were sought for violation of the criminal law for failing to help an eighty-two-year-old man who had collapsed in the street. Those wanted faced up to a year in prison.[319] Likewise, Israel requires that civilians take action if they encounter a person in distress, or face fines. People who offer assistance in emergencies in Israel are entitled to compensation for any damages incurred as a result of providing help, per the same law.[320] Those who fail to render aid in France face civil and criminal liability for the omission according to Criminal Code Art 223-6, punishable by up to five years in prison

317 Justin Huggler, "Four Wanted in Germany for Failing to Save Man under 'Good Samaritan' Law," *Telegraph*, October 31, 2016, https://www.telegraph.co.uk/news/2016/10/31/four-wanted-in--germany-for-failing-to-save-man-under-good-samar/.

318 "Rescue Act," Finnish and Swedish Ministry of the Interior, 2011, https://finlex.fi/fi/laki/kaannokset/2011/en20110379.pdf.

319 Huggler, "Four Wanted in Germany."

320 "Israel Law 1670-1998," nevo.co/il, accessed August 20, 2020, https://www.nevo.co.il/law_html/Law01/193_001.htm.

and a fine of 75,000 euros.[321] Portugal's duty-to-act provision stipulates that failure to provide assistance is punishable by up to three months in jail.[322]

2. Good Samaritan Law Challenges

Challenges to the theory of protecting Good Samaritanism have been known to erode public trust. The failure to protect those who provide assistance during an emergency can discourage bystanders from helping those in need. In 2006, Xu Shoulan, an elderly citizen in the People's Republic of China, disembarked a bus, fell, and broke her femur. Peng Yu, another citizen, encountered Xu, helped her, and transported her to the hospital. Xu accused Peng of causing the injury and demanded payment. In 2007, the Guolou District Court in Nanjing ruled in favor of Xu, stating that "no one in good conscience would help someone unless they felt guilty."[323] Peng was ordered to compensate Xu. The incident demonstrated that without a Good Samaritan law, the public is exposed to great risk if they decide to help in emergencies. Though hardly a new tactic in China, the case created a new wave of exploitation by criminals pretending to be victims, then suing or otherwise extorting the immediate responder who came to his or her aid. This marked the beginning of a noticeable decline of immediate responder action in the country.

As helping behavior continued to decay in China, one case caught international attention. On October 13, 2011, a two-year-old girl, Wang Yue, was wandering in an alley outside of her father's hardware store when she was hit by a van. The van fled and no one came to her aid. She was then struck by another van. Video surveillance caught the accident, followed by eighteen people passing by without rendering aid over the next ten minutes. Finally, a fifty-eight-year-old trash collector came to the child's aid, moving her to safety and summoning help. The child eventually died in the hospital, sparking outrage across the globe. Many blamed the culture of distrust that came from incidents such as the

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321 "The Good Samaritan Law across Europe," Dan Legal Network, accessed February 22, 2020, https://www.daneurope.org/c/document_library/get_file?uuid=c09228f3-a745-480b-9549-d9fc8bbbd535&groupId=10103.

322 Dan Legal Network.

323 Melody W. Young, "The Aftermath of Peng Yu: Restoring Helping Behavior in China," *Pacific Rim Law and Policy Journal* 22, no. 3 (June 2013): 691–712.

Peng Yu exploitation. Others, expanding upon the exploitation and side effects, stated that the lack of Good Samaritan protection had effectively staunched helping behavior by bystanders.[324] Following the incident, Xia Xueluan of Peking University explained, "This kind of crisis is highly contagious and could deteriorate due to lack of legal support. As a netizen puts it, it's not that the good people can no longer be found in our society. It's that nobody can afford to do good deeds—the price can be too high."[325] Eight years later, following a spate of similar events, China enacted a Good Samaritan law that protected people who help those who are, or are believed to be, injured, ill, or in danger.[326]

In 2004, the Good Samaritan law of California was tested when bystander Lisa Torti pulled a victim from a car crash where she believed the car was catching fire.[327] The victim, Alexandra Van Horn, was paralyzed in the accident, which she attributed to Torti's actions.[328] At the time, Statute 1799.102 read:

> No person who in good faith, and not for compensation, renders emergency care at the scene of an emergency shall be liable for any civil damages resulting from any act or omission. The scene of an emergency shall not include emergency departments and other places where medical care is usually offered.[329]

Van Horn sued Torti for negligence. The trial judge originally dismissed the suit on the grounds that the Good Samaritan law protected Torti. The California Supreme Court, however, overruled that decision in favor of the plaintiff, citing that the law only protected those providing *medical care* following an accident.[330] Rescue operations, such as

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[324] Jaime FlorCruz, "China Soul-Searching after Toddler's Death," CNN, October 22, 2011, https://www.cnn.com/2011/10/22/world/asia/china-toddler-reaction/index.html.

[325] CNN.

[326] "China's Good Samaritan Law Goes into Effect," China Legal Information Center, October 9, 2017, https://www.chinadaily.com.cn/m/chinalic/2017-10/09/content_33022361.htm.

[327] Alison Stateman, "The Perils of Being a Good Samaritan in California," *TIME*, January 14, 2009, http://content.time.com/time/nation/article/0,8599,1871331,00.html.

[328] Stateman.

[329] "Liability Limitation," Health and Safety Code div. 2.5 Ch. 9 Stat. 1980, Ch. 1260, https://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?sectionNum=1799.102.&lawCode=HSC.

[330] Stateman, "The Perils of Being a Good Samaritan in California."

removing a patient from impending doom, was beyond the scope of medical care and, therefore, not protected. A succession of appellate courts upheld the ruling.[331] Legal activists and those who desired the law to encourage helping behavior worked to have the law rewritten to include nonmedical rescue care. Lawmakers agreed, citing the need for helping behavior in an amended Statute 1799.201, passed in 2009, which reads:

> No person who in good faith, and not for compensation, renders emergency **medical or nonmedical care** or assistance at the scene of an emergency shall be liable for civil damages resulting from any act or omission other than an act or omission constituting gross negligence or willful or wanton misconduct.[332]

Lawmakers codified their intent in the same law, stating, "It is the intent of the Legislature to encourage other individuals to volunteer, without compensation, to assist others in need during an emergency, while ensuring that those volunteers who provide care or assistance act responsibly."[333] Six other states still have laws that are more restrictive than the original California law. In those states, only provision of CPR and AED care is protected. Four other states extend Good Samaritan protections only to medical providers, not laypeople.

3. Providing Legal Protections to Encourage Immediate Responder Assistance

Bystanders should be encouraged to act because they provide significant benefit to victims, responders, and the community following an MCI. If a community wishes to foster this behavior, it must provide the legal protections for the potential rescuer. As the early literature suggests, some passive bystanders explained that they were hesitant to act because of the potential for litigation. More recently, surveys and focus groups studying why civilians did not perform CPR revealed one of the main reasons was the participants'

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331 "The California Supreme Court Holds That Good Samaritans Providing Nonmedical Aid Can Be Held Liable if They Act Negligently," Findlaw, accessed March 4, 2020, https://supreme.findlaw.com/legal-commentary/the-california-supreme-court-holds-that-good-samaritans-providing-nonmedical-aid-can-be-held-liable-if-they-act-negligently.html.

332 Emphasis added. California Health and Safety Code, § 1799.102 (2017), https://law.onecle.com/california/health/1799.102.html.

333 California Health and Safety Code.

fear of litigation if the action was performed incorrectly. Following the Chinese court's ruling against citizen helper Peng Yu, the helping behavior across the country decayed. A culture of distrust grew, and people came to realize they could not afford to help one another. The negative effects of failing to protect helpers became abundantly clear in 2011 in the Wang Yue case. In contrast, in Israel, where helping behavior is part of the culture, a strong Good Samaritan law not only protects immediate responders from liability but also ensures the government will compensate the rescuer for any damage incurred as a result of the rescue effort, including property or health problems. The law includes provisions to penalize those who do not help with a nominal monetary fine, emphasizing the society's desire for citizens to help. The correlation between the level of protection provided by the law and the level of immediate responder action following an emergency in both countries suggests that helping behavior is influenced by legal protections.

Today in the United States, every state and the District of Columbia has a version of the Good Samaritan law. As is typical with the patchwork of state laws, there are a number of variations between the laws, including who, what types of emergencies, which patient conditions, what rescue or medical actions, and what incident locations are protected.[334] Though nuanced, thirty-three states have laws that protect all people providing aid to anyone in apparent distress. Six states have Good Samaritan laws that apply only to CPR and AED administration. Oklahoma protects those delivering CPR and AED care, as well as those "retarding the blood loss," though no other care is included in the law.[335] Kansas, Kentucky, and Missouri protect only trained medical providers. Minnesota, Vermont, and Rhode Island's Good Samaritan laws include a duty-to-act provision, wherein failure to provide or summon help can result in a petty misdemeanor conviction, punished by a fine ranging from $100 to $500, and imprisonment up to six months.

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[334] West and Varacallo, "Good Samaritan Laws."

[335] Responsibility for Negligence—"Good Samaritan Act," Oklahoma Statutes, §76-5(2) (2019), https://oksenate.gov/sites/default/files/2019-12/os76.pdf.

The Good Samaritan laws are widely inconsistent across U.S. states. A person on a road trip would be compelled to provide assistance in Minnesota, but once that person drives into South Dakota, she would be protected only if she provided CPR or AED care. As the traveler continues and crosses into Nebraska, she would be fully covered by the Good Samaritan laws. But providing the same care once she travels into Kansas would be protected only if she were a licensed medical provider. It is unreasonable to expect citizens inclined to help to sort through the parameters of state laws to determine if their helping behavior may put them in legal jeopardy. Further, it is only fair to provide legal protections for immediate responders who act in good faith during an emergency. To leverage immediate responders during the resource-strained MCI, a consistent Good Samaritan protection across the country is necessary. Consideration should also be given to including duty-to-act parameters within the law.

C. TRAINING

Proper disaster preparedness always involves training and education.[336] To shift the MCI response paradigm to include immediate responders, several training initiatives must be delivered. Training should be delivered to planners, professional rescuers, and citizens, and should be based on the revised MCI plans that include the roles and incorporation of immediate responders. The policy is important for establishing goals and expectations, but it is the education and training that will make the policy become a reality.

There are many reasons to train bystanders to become immediate responders. Early studies by Russell Clark and Larry Word suggested that bystanders are dissuaded from intervening if they do not have a clear understanding of the emergency and what they should do.[337] The Piliavins's studies suggested that people do not act if they sense a heightened risk to them, such as the appearance of blood on the victim.[338] Denner found a simple explanation for bystanders choosing not to help: they are embarrassed that they may

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336 Quarantelli, "Organizational Behavior in Disasters."

337 Russell D. Clark and Larry E. Word, "Why Don't Bystanders Help? Because of Ambiguity?" *Journal of Personality and Social Psychology* 24, no. 3 (December 1972): 392–400, http://dx.doi.org/10.1037/h0033717.

338 Piliavin and Piliavin, "Effect of Blood on Reactions to a Victim," 353.

be seen doing the wrong thing.[339] An educational program can address each of these elements to reassure bystanders and encourage them to act.

Quarantelli and Stalls explain that the more the skills or knowledge bystanders have related to preparedness and medical care, the more likely they are to act.[340] Jack Kartez and Michael Lindell state that formal organizations, such as law enforcement, that treat immediate responders as a nuisance will discourage life-saving behavior at an emergency and have impacts on such action in the future.[341] People are more inclined to act based on how much they know, so accurate information dissemination is critical for immediate responder emergence, claim Daniel Curran and Herman Leonard.[342] Bloom explains that people who are resilient, defined as having faced a great deal of adversity over their lifetimes, are more likely to act.[343] Rachele Kanigel further supports this with findings from those who have experienced trauma through war and violence.[344]

The government at all levels should create a public outreach campaign aimed at convincing bystanders that they should act, when safe and appropriate to do so. The campaign should be prolific and lasting, delivering a consistent message that will reach all audiences, much like the See Something, Say Something campaign. The government should employ professional marketing experts to ensure this promotion is delivered through the correct vectors with the appropriate amount of influence. The public should be made aware of why they are needed, where and how they can intervene, what protections they have, and where to seek further information. To begin this cultural shift, the pubic must want to help, which is why this persuasive campaign is important.

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339 Denner, "Did a Crime Occur?"

340 Stallings and Quarantelli, "Emergent Citizen Groups and Emergency Management."

341 Jack D. Kartez and Michael K. Lindell, "Planning for Uncertainty: The Case of Local Disaster Planning," *Journal of the American Planning Association* 53, no. 4 (December 31, 1987): 487–98, https://doi.org/10.1080/01944368708977138.

342 Daniel Curran and Herman B. "Dutch" Leonard, "Recovery in Aceh: Towards a Strategy of Emergence" (working paper, Harvard Business School, May 2006), https://www.hbs.edu/faculty/Pages/item.aspx?num=21453.

343 Bloom, "Chaos, Complexity, Self-Organization."

344 Rachele Kanigel, "Are You Resilient?" *New England Financial Journal* (2001): 46–51.

A comprehensive training program should be developed to educate entire communities on preferred immediate responder action. The public training should be focused on life-saving medical techniques that are common, such as treatments for external hemorrhage, airway compromise, chest penetrations, and hypothermia. The goal should be to build a more resilient public that is calm and empowered during emergencies, which includes considerations beyond medical care. Potential immediate responders should also be taught basic personal emergency preparedness, scene safety, and general principles for helpful behavior during emergencies. Training should also include guidance on how to mitigate the danger immediate responders will face due to the ongoing threat present in some intentional MCIs. The expectations of immediate responders should be clear, with definitive direction on how to best integrate and coordinate with professional responders. These actions should comport with the emergency plans and be compatible with the expectations of responders with whom the immediate responders will interface.

Reaching the general public with an established training program is a vast undertaking, but it is necessary to inculcate helping behavior in a way that will agree with MCI plans. Israel is known for its culture of preparedness and immediate responder intervention. The Israeli government attributes much of this behavior to training that is delivered during compulsory military service, which allows the government to reach nearly 75 percent of the population. Though there is no conscription in the United States, the K–12 school system allows an opportunity to reach nearly 100 percent of the population between the ages of five and eighteen. School training would allow for universal delivery, regardless of socioeconomic status, race, ethnicity, and other barriers that have been cited as obstacles to CPR education.

Consideration should be given to modifying school curriculum to build the next generation of immediate responders. An approach that ensures all students receive the standardized training prior to graduating will deliver a generation that has been almost completely indoctrinated to this helping behavior. Curriculum specialists should be engaged to determine age-appropriate lessons that build over the course of a student's academic career. Principles should include personal resilience, preparedness culture, how to recognize threats and emergencies, proper behavior in emergencies, cognitive behavior

management techniques for remaining calm and rational, and medical skills. Many students participate in community activities, so the importance of creating a culture of preparedness within the group should not be underestimated. Engaging students through the school curriculum allows nearly the entire population of that generation to be impacted by the teaching. This would be a proxy to Israel's compulsory military service, to which the country's helping culture is attributed.

While in school, students are primed for learning, which studies have shown aids in comprehension and retention of material. Delivery of the training through schools has the added benefit of allowing the student to provide the same training to others at home, as seen with the CPR take-home kits. The students will be the same population that will attend concerts, sporting events, mass gatherings, and other events where intentional MCIs have been known to occur, instantly implanting immediate responders at these vulnerable venues. Further, if the course is required for high school graduation, it is nearly assured that within a few generations, the training will have reached most of the United States, creating a culture of preparedness and immediate responder action.

The training should extend beyond the schools, to impact older populations and to provide refreshers for students following their academic careers. Disaster preparedness should be viewed as a lifelong effort that requires consistent and routine practice for optimal results. The decades of experience delivering CPR training to the public should be leveraged to determine the best means through which to educate the public. Methods that have been effective in CPR, such as train-the-trainer layperson instruction, videos, online instruction, and simple poster presentations, should be considered.

In the effort to incorporate immediate responders as part of the response for MCIs, it is as important to train professional responders for the new paradigm. Professional rescuers are accustomed to working with personnel who have similar, standardized training and operate within a rigid command-and-control structure. They have been taught that bystanders can be a nuisance and obstacle, and that their removal from the scene is imperative for effective response—misconceptions that have been dispelled in this thesis. Emergency personnel should be taught about the expected behavior of immediate

responders, what roles each entity will play, and how to best integrate and leverage the resource to accomplish the broad mission objectives.

To augment training, apply the skills, and evaluate the efficacy of plans and lessons, civilians should be included in MCI exercises with professional responders. Though immediate responders play an integral role in the response to MCIs, they are rarely included in formal exercises. Just as any other response agency must be included to make the exercise an accurate depiction of an actual event, immediate responders must take part in the scenario. Immediate responders, both trained and untrained, should be allowed to perform freely and unprompted, just as they would during an actual event. Responders should be given the opportunity to interface and integrate with immediate responders to develop and implement a coordinated response that leverages all resources. This will allow immediate responders and responders alike to have advance knowledge of what to reasonably expect from the other parties during an actual MCI response.

D. SUMMARY

Bystanders can and will become immediate responders following an MCI. As agencies aspire to leverage this resource, they should consider how to best prepare the system and the potential immediate responders in advance of an MCI. The lessons learned from nearly seventy years of public CPR education and outreach in the United States can provide guidance on how to engage the public to act during emergencies. The current Good Samaritan protections provided vary by state and often do not protect the type of action that would be required of immediate responders following an MCI. Such laws should be standardized and bolstered to encourage immediate responder action. A comprehensive training program, delivered primarily through the K–12 curriculum but also through community events, can create an entire generation that is prepared to serve in the critical immediate responder role. Several recommendations are made in the next chapter to support the development of this culture, as well as to provide structures and systems that plan for, and provide management of, immediate responder action following an MCI.

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VIII. RECOMMENDATIONS AND CONCLUSION

As shown in this thesis, bystanders can and will emerge following an MCI, becoming immediate responders. The immediate responders will evacuate, treat, and transport themselves and one another to hospitals. They offer immediate assistance during a time-critical period and become a force multiplier for limited emergency resources. However, they can also cause unintended consequences, such as overcrowding hospitals and contributing to scene disorder. Communities should incorporate immediate responder emergence into their MCI plans and develop the support structures to drive this resource to be most successful.

A. RECOMMENDATIONS

Policymakers, emergency response leaders, health care leaders, community members, and researchers can contribute to the development and maintenance of a helping culture. Together, society can prepare immediate responders prior to an event and provide management of this critical resource during an MCI. The following recommendations are made to encourage helping behavior and incorporate the behavior into MCI response.

1. Deploy EMS Response to Hospitals to Redistribute Patients

Immediate responder emergence is a common occurrence during intentional MCIs. The impacts beyond the scene are nearly immediate and have severe consequences for the health care system, such as over-convergence on the closest hospital, poor triaging of patients, little to no treatment delivered prior to hospital arrival, and patients delivered to community hospitals when they need specialty centers. Emergency plans should therefore include procedures for mitigating these unintended consequences.

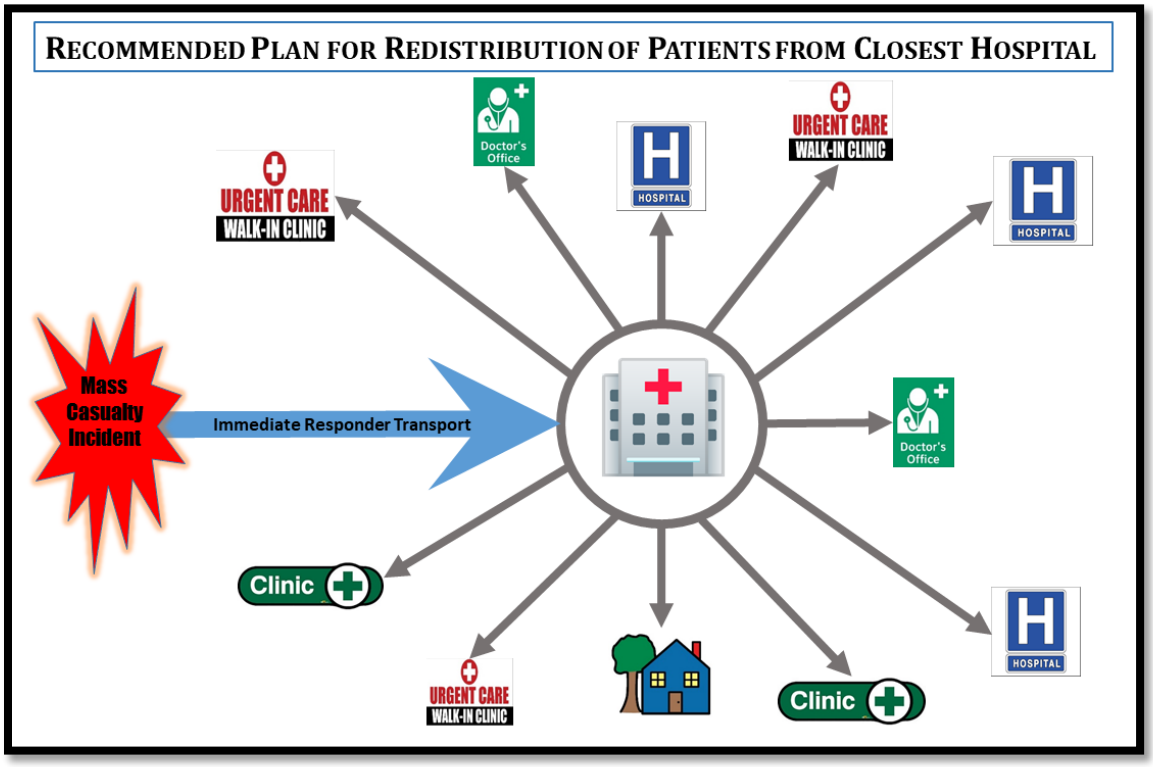
Emergency responders should engage the public as early as possible to direct their transportation efforts. Once on scene, personnel should be assigned to interface with immediate responders before they leave the scene. Professional responders will be able to identify the patients that must be immediately transferred to an EMS asset. For the less severe patients that will be transported by immediate responders, a professional responder

should assign the driver to a specific hospital in accordance with a coordinated patient distribution plan, and provide hospitals with advanced notification. Using emergency alert push notifications, mapping tools, radio, and other broadcast means, incident managers can also reach those who have already left the scene, providing the same direction to minimize over-convergence on a single hospital.

During this initial period of chaos, however, it is unlikely that emergency responders will be able to effectively coordinate or direct immediate responders. Therefore, public safety resources should view the location of the patients, not the location of the incident, as the MCI scene. As patients are shifted from the scene to the hospital, this usually creates a secondary MCI at the hospital site. Immediate responders often transport patients prior to arrival of EMS units, and certainly before the EMS units can balance the resources with the demand. To address this, in addition to those units sent to the scene, a cadre of emergency response assets should be routed to the closest hospital as soon as the 911 center is notified of the MCI. This would include transport assets, manpower, and MCI vehicles equipped with caches of equipment and supplies. This will allow personnel who are trained in field operations to address the MCI that emerges at the local hospital. This is the location where public safety can gain control of patient flow, thereby reducing morbidity and mortality.

At the hospital, EMS personnel will take on much of the same role they would at the scene according to traditional response plans. They will remove patients from vehicles, conduct triage, and provide immediate assistance to those who need it. Working with the local hospital, as well as the broader health care system, the EMS units will redistribute patients to surrounding facilities. This will take into account the bed and staff availability of each facility, as well as patient conditions and needs for specialty services. While maintaining compliance with the Emergency Medical Treatment and Labor Act (EMTALA) disaster provisions, patients of low acuity should be transported to alternate care sites. Ambulances, vans, and buses staffed with medical professionals should move patients to urgent care centers, or to hospitals outside of the area already receiving MCI patients, as portrayed in Figure 2. This approach will allow for proper stabilization of

patients and even and appropriate distribution throughout the health care system, and will prevent the local hospital from having to absorb the bulk of the patients.



Patients will likely overwhelm the closest hospital, delivered by immediate responders by private car, police car, walking, or other means. EMS and the health care system must work together to redistribute patients across the broader health care spectrum using a variety of transport mechanisms, including ambulances, medical ambulance buses, mass transit and school buses, and vans.

Figure 2. Recommended Plan for Redistribution of Patients from Closest Hospital

2. Apply Management Frameworks Compatible with Modern MCIs

MCIs produce qualitative challenges that make the concepts of ICS and NIMS, which are used for routine events, incompatible in the immediate aftermath of the event. The rigid, bureaucratic structure of these plans cannot be successfully applied, and valuable incident management resources are consumed in attempts to force these models to function. A management framework that, unlike ICS and NIMS, acknowledges a period of chaos should be developed to better support MCI response operations.

Command and control, long embraced by emergency services, should be abandoned in favor of analysis and adaptability. Plans and management structures should allow for flexibility to the dynamic conditions and demands of an MCI. The plan should encourage commanders to work through this initial chaos, allowing the emergence and seemingly uncoordinated response to take place. Emphasis should be placed on understanding complexity, sensemaking, and emergence, all characteristics that define an MCI response.

The plan should not direct specific tactics but instead call out broad strategies. Commanders should use this plan to manipulate variables and guide the incident toward resolution. Incident management should follow through the domains of the Cynefin framework rather than forcing a predefined organization chart with strictly defined duties upon responders. The plan should call for applying traditional ICS and NIMS structures only once the environment is conducive to them.

3. Develop Incident Commanders' Capabilities to Address Modern MCIs

Incident commanders have been taught that ICS and NIMS should be applied to every incident. Since the novelty and complexity of an MCI are incompatible with these structures, new approaches must be taken to manage and eventually control these incidents. To allow for that, an educational curriculum should be developed to provide incident commanders with the skills and knowledge they need to lead in a highly chaotic, complex, and dynamic environment.

First and foremost, the curriculum should educate commanders on the characteristics, demands, and social dynamics of an MCI that make their traditional approach inapplicable. Myths about bystander inaction should be dispelled and students provided with an understanding of actual human behavior in the aftermath of an MCI. These attributes should be used to illustrate complexity theory, providing an understanding of the cues and indicators of the specific domains of the Cynefin framework. Students should be able to use sensemaking tools to analyze the incident's components and

understand not only into which domain they fall but also how to operate in that environment for successful incident management.

Most importantly, the incident commander should be taught to let go of many of the tenets that have been reiterated throughout their careers. In the MCI environment, the typical approaches do not apply, and incident commanders must be able to think their way through the many confounding factors. Commanders should be taught to be comfortable operating in chaos, and must understand that poor coordination in the early phases is to be expected and does not render a response ineffective.

The curriculum should include techniques for guiding behavior, rather than commanding it, as public safety will not govern all components operating in the response. Incident commanders should be taught to integrate disparate resources to achieve common goals. Using broad strategic goals, the commander can orchestrate the numerous components and connections within the complex response to efficiently and effectively leverage each, including immediate responders, to accomplish the mission.

4. Deliver Training to Civilians to Encourage Helping Behavior

As the paradigm shifts to recognize and manage immediate responder behavior following MCIs, training must be delivered to civilians to turn disaster planning into a reality. A concerted educational campaign that encourages preferred actions should be developed to train civilians. The training should be focused on basic trauma care for life-threatening injuries, to include external hemorrhage, airway compromise, chest penetrations, and hypothermia. The course should also include basic emergency preparedness, general principles of helpful and safe behavior following an MCI, and how to best integrate and coordinate with professional responders. The lessons learned through decades of public CPR instruction should be incorporated into the training approach.

To reach a broad swath of the community and thereby inculcate the helping behavior as early as possible, this training would best be included in the K–12 curriculum in U.S. schools. This will allow the standardized training to be delivered to most of the population between that ages of five and eighteen, developing a generation that has been indoctrinated into this helping behavior. Throughout the students' academic careers, they

should be taught progressively more comprehensive disaster skills, including personal resilience, preparedness culture, how to recognize threats and emergencies, proper behavior in emergencies, cognitive behavior management techniques for remaining calm and rational, and medical skills.

The training should be complemented with a public outreach campaign that encourages bystanders to act and to seek the training. Marketing should be similar to the See Something, Say Something campaign. Civilians should understand that they are needed, how they can intervene, what protections they have, and where they can receive training. The outreach and training must also include instruction that addresses when civilians should not intervene, such as if they are not already on the scene, or when there is a hazard that would endanger the immediate responder.

5. Develop Stronger, More Consistent Good Samaritan Protections

All U.S. states currently have some form of Good Samaritan law. However, six only protect for CPR and AED use, and four protect only medical providers. To encourage the public to act during times of emergency, and to foster a culture of helping behavior, Good Samaritan laws should be bolstered and standardized. The laws and protections should not vary between states; they should unanimously protect civilians from civil liability if the immediate responder is acting in good faith, under emergency conditions, without compensation, provided there is no gross negligence or willful or wanton misconduct. The coverage should apply to all emergency actions, including medical care for traumatic injuries and moving patients out of harm's way, if necessary.

Consideration should be given to include a duty to act, with nominal penalties applied to those who bypass an emergency without at least notifying professional rescuers. A federal law should be established to provide this protection. However, most civil litigation occurs at the state level, so a strategic means of standardizing these laws should be developed. Policymakers may consider requiring a state to create a Good Samaritan law that includes the desired language and parameters for that state to be eligible for federal grant funding or to receive support for the development of immediate responders.

6. Conduct Further Research

a. Research Limitations

This research presented in this thesis is subject to several limitations. The cases highlighted were meant to provide illustrations of the trends observed in immediate responder behavior. Therefore, the sample size was small and statistically insignificant. Based on this research, it is impossible to determine if this behavior is guaranteed in every event, or what percentage of bystanders become immediate responders.

Official, government-sanctioned after-action reports were limited to specific disciplines and usually did not expand to any roles and functions outside the domain of a single department. To capture the comprehensive effects across all agencies and the health care system, reputable media reports and academic research was the primary source of information. It is unclear if the authority carried by government-sanctioned reports would lend more credibility to the facts presented in the case examples.

There is minimal previous research regarding immediate responders following an intentional MCI. As such, there is limited empirical evidence about the behavior and impacts of immediate responders during an intentional MCI versus a natural or accidental one. The limited sociological studies regarding antagonistic MCIs led to some reliance on evidence from MCIs in general rather than violent MCIs specifically. It is an assumption that some or all of this behavior included in the general MCI research is to be reasonably expected in MCIs caused by violence, as was observed in the case examples.

The nature of immediate responders, as has been explained, is that they emerge and dissipate without formality. Rarely is it possible to follow up with immediate responders, as their identity remains anonymous. Accounts of immediate responder action are therefore limited to the few immediate responders that can be accurately identified, as well as eyewitness accounts. It is difficult to fully understand psychological and sociological motivations behind such action without the ability to follow up with the immediate responders.

b. Further Research Recommendations

As the disaster sociology literature has expanded, there remain weaknesses and gaps in the research. Much of the work regarding disaster emergence has referred to groups that responded late in the response phase or, more so, in the recovery phase. There is minimal literature regarding the individuals and groups that respond immediately after a disaster occurs, such as immediate responders following MCIs, and the operational impacts on emergency response operations. Much attention has been given to search and rescue, particularly after natural and technological disaster. These events can be similar to intentional MCIs in that they provide no notice, produce an overwhelming number of patients, impact a wide geographic area, and include impediments to rescuers making it to the scene. Nonetheless, there remains little work devoted solely to the unique challenge of intentional MCIs. John Twigg and Irina Mosel also point to a narrow scope of case studies, stating, "Very little is known about the nature and forms of urban disaster emergence in long-running crises, or in urban settings where there are governance failures, conflict (political, social, ethnic), violence and criminality."[345] Further, while immediate responder emergence is a recognized phenomenon, it is still unknown what proportion of bystanders do become active, which is fundamental to understanding how to increase this helping behavior. Finally, in comparison to the volumes of work concerning group disaster behavior between 1950 and 2000, there has been minimal novel or updated research in the past twenty years.

Researchers should continue to study immediate responder emergence and broader psychological and sociological motivations and impacts of disasters. The inaccurate stereotypes regarding bystander inaction were developed by psychologists many decades ago. A new body of literature should review contemporary emergency incidents and determine if the previous findings still apply. Immediate responder emergence, at least to the point that it impacts the overall incident response, appears to be more prevalent today. The literature should identify if helping behavior has actually increased, or if the appearance is an artifact of media access and proliferation. Researchers should also identify

[345] Twigg and Mosel, "Emergent Groups and Spontaneous Volunteers in Urban Disaster Response."

the proportion of bystanders that act and suggest means to motivate the remaining portion to contribute.

There is little literature regarding intentional MCIs and the unique challenges they cause, including how they change bystander behavior. It is implied that the studies that have been conducted regarding natural and technological disasters are applicable to all MCIs. However, many of the constructs of those types of disasters differ from intentional MCIs. As these intentional events continue to grow in frequency and magnitude, research should be conducted on how to best respond to the unique circumstances, including bystander behavior. The new studies should concentrate on intentional MCIs, particularly those that occur in urban settings; involve complex attacks; include political, social, or ethnic motivations; and are caused by violence. These characteristics are underrepresented in the existing literature.

Immediate responder emergence during MCIs is a unique behavior, the nature and impact of which is rarely understood in retrospect. As immediate responders fade back into the community, it is difficult to later reconstruct the event and reach those who acted. It is also nearly impossible for researchers to fully comprehend the intense emotional and social dynamics of an emergency incident by merely reviewing incident and witness reports. It is recommended that a team of researchers deploy to incidents to observe the setting, behavior, and response operations firsthand. Being immersed in the environment of the edge of chaos during which this behavior occurs will allow researchers to better understand the behavior and motivations.

B. CONCLUSION

Many of the assumptions that drive MCI response plans are predicated upon the belief that bystanders will remain passive. These assumptions include disaster syndrome, panic, and social breakdown. Recent events, however, have disproven these assumptions. Bystanders have been shown to take an active role in helping themselves and each other, becoming what has been termed immediate responders. They play a critical role in filling the immediate gap between when the onset of the emergency and when professional rescuers arrive. They have been shown to lead evacuations, provide treatment, and

transport patients to definitive care. When the demand outpaces resources, these immediate responders continue to be integral to the success of the MCI response, serving as a force multiplier for the strained response resources.

1. The Critical Role of the First Responder

Immediate responders are particularly important following intentional MCIs. The life-threatening injuries caused by shootings, stabbings, explosions, and vehicle rammings demand immediate treatment if the victim is to survive. With potential secondary or ongoing attacks, timely evacuation is critical, which requires the help of civilians before and after professional responders can arrive, especially for those who are immobilized by their injuries. The delays in professional responders reaching the scene following intentional MCIs, caused by elements such as large geographic areas, ongoing threats of violence, and interception by patients while responding, make immediate responder action important. Finally, immediate responders provide quick and effective transport of victims to local hospitals, preempting or augmenting an EMS system that is already overwhelmed by the demand.

Recent intentional MCIs have shown that, without prompting, bystanders can and will emerge as a meaningful response force immediately following a disaster. In the cases of the September 11, 2001, World Trade Center attack, 2004 Madrid train bombings, 2013 Boston Marathon bombings, 2016 Pulse Nightclub shooting, and 2017 Las Vegas Route 91 Harvest Festival shooting, immediate responders treated, evacuated, and transported victims. Individuals acted independently and as groups to emerge as effective rescuers. This occurred before professional rescuers arrived, and continued thereafter until the on-scene demand and resources stabilized. In each of these incidents, immediate responders transported more patients than traditional EMS ambulances, and EMS and physicians alike credited the quick action of these empowered bystanders with saving lives.

2. Challenges of Immediate Responder Action

Along with the positive impacts of immediate responders, their actions have caused inadvertent challenges following MCIs. Without medical training, they often inaccurately triage patients. This leads to misdirection of efforts toward unsalvageable victims or

patients with minor injuries while others would who benefit more from the assistance are left untreated. The immediate responders usually view transportation to the hospital as the desired outcome, so they quickly deliver patients to the closest hospital. This overwhelms the local hospital and does not leverage the entire health care system. Further, it does not direct patients to specialty centers, which may be necessary for the types of injuries sustained in the MCI. The civilian transports challenge hospitals by delivering patients without prior notification, and with little or no prehospital care and stabilization provided. Due to the poor scene triage and the ability to self-transport, many patients of low acuity are the first to arrive. This leads hospitals to incorrectly believe these minor injuries are the worst of the injuries to be expected, and these patients with minor injuries absorb the limited resources prior to the arrival of the more serious patients.

3. Managing Immediate Responders at the MCI Scene

To leverage the immediate responders, and counter the challenges this type of response causes, incident commanders must manage this resource. Immediate responders do not fall within the realm of control of the incident commander, unlike professional response assets. This contradicts the constructs used in traditional command-and-control incident management. But immediate responders are only one portion of violent MCIs that introduce complexity that is incompatible with the tools used for routine emergency management. The rigid bureaucracy involved in traditional incident command does not function in the modern, complex MCI, especially those that are caused intentionally and involve immediate responders. Effective management and optimum resolution of these types of events demand a new method of incident leadership.

Rather than trying to overlay the structures of ICS to force a sense of order, the incident commander should understand the complexity and the subsequent chaos, and should learn to operate within that environment. To do so, the incident commander will need to understand the basic tenets of complexity theory, be capable of performing accurate and ongoing sensemaking, and know how to operate on the edge of chaos. Rather than commanding in the traditional sense, the incident commander will use new skills and knowledge to coordinate the various components and relationships within the complex

system, leading the event to resolution. One such sensemaking tool, the Cynefin framework, can be useful in differentiating which components can and should be directed and which should be allowed to emerge organically. By applying this framework thoroughly and continuously, the incident commander will be prompted to act in ways that are best suited for the particular domain in which the incident and its components are situated at the time.

4. Cultivating and Managing a Helpful Culture

Bystanders have repeatedly transformed into immediate responders following recent MCIs. The advantages and disadvantages of this action have been consistent and predictable. As the frequency of intentional MCIs increases, the emergence of immediate responders will likely increase as well. In response to an incident that demands immediate assistance to victims and vastly overwhelms the health care system designed to treat them, the extra help should be encouraged. Therefore, the community should foster a culture of helping behavior and healthy disaster response. Based on decades of inculcating bystander CPR, the government should endeavor to train civilians to become immediate responders. Training should include personal resilience, disaster preparedness, scene safety, trauma care, general principles for treatment and transport, and how to most effectively integrate with professional responders. Good Samaritan laws should be bolstered and standardized to provide protections that encourage immediate response.

In response to the incident itself, incident commanders must apply their new knowledge and skills to orchestrate all available resources, including immediate responders. To counter the unintended consequences of immediate responder patient transport, public safety should position response assets at the closest hospital to manage the secondary MCI, the influx of patients at the facility. These crews will perform triage and prehospital treatment, move critical patients into the hospital, and redistribute noncritical patients throughout the health care system. Finally, further research should be conducted to better understand immediate responders during intentional MCIs. Better understanding of this behavior, including the psychological and sociological motivations, will allow for better management and leverage of this valuable resource.

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