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## Multinomial Logistic And Negative Binomial Regressions Of Campus Instructional Modes, Institutional Characteristics, And Covid-19 Case Counts In Fall 2020 In The Midwest

Katherine Marian Tyler

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Multinomial Logistic and Negative Binomial Regressions of Campus Instructional Modes,  
Institutional Characteristics, and COVID-19 Case Counts in Fall 2020 in the Midwest

by

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Grand Forks, North Dakota

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Fall 2020 in the Midwest

Department    Education, Health, and Behavior Studies

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## **ABSTRACT**

In spring of 2020, a global pandemic shifted American institutions of higher education into a crisis with unprecedented unknown information, guidelines that changed continuously, and impacted the personal and professional lives of students, faculty and staff. This study examined the relationships (1) between campus size, geographic setting, locus of control in Midwest and Mountain American higher educational institutions and their instructional mode in fall 2020, and (2) between those institutional characteristics and the number of reported campus COVID-19 cases in the fall of 2020. Using a multinomial logistic regression and a negative binomial regression with an estimated parameter dispersion, the study suggested that campus control and campus setting did relate to the instructional mode response. Campus size, instructional mode, and campus setting related to the number of COVID-19 cases in fall 2020. One major implication of the findings would be to include an evaluation of instructional mode and a consideration of a campus' size and location to impact a campus crisis response, specifically for COVID-19. Additionally, providing faculty support to overcome barriers found during COVID-19 is essential to the future planning for similar crises.

Keywords: emergency preparedness, emergency response, crisis, pandemic, COVID-19, delivery mode, instructional mode, higher education

## CHAPTER I

### Introduction

In early 2020, reports from China confirmed the transmission of an unknown virus, later identified as a coronavirus. Confirmation of a case in the United States occurred by January 21<sup>st</sup> (CDC, 2020a). For the next month, the number of cases and deaths around the world rose, and by March 11, the World Health Organization declared the coronavirus a pandemic (Keaten et al., 2020) with the United States declaring a National Emergency on March 13, 2020 (FEMA, 2020). During March 2020, COVID-19, this strain of the coronavirus, caused colleges and universities across the United States to scramble as classes shifted to online only instruction at more than 1,350 institutions in all 50 states (College Crisis Initiative, 2020). School closures, changes to course delivery, quarantines, and a halt to student travel were among the institutional responses quickly made.

At the start of the fall of 2020, colleges found themselves six months into a global pandemic with a magnitude greater than any previous pandemic since 1918. Questions swirled around campuses on how to reopen safely (if at all), how to deliver quality courses in a safe manner, and what the future may hold. There was not a one-size-fits-all response that would work as the best-prepared colleges needed a multifaceted approach leveraging the best strategies for individual institution size, location, and culture. Testing, behavioral interventions such as social distancing, masking, and contact tracing, and limiting the spread from outside the campus were precautionary options institutions considered. The future remained with many unknowns.

When a global pandemic hits, there are no organizations immune to the crisis (Coombs, 2015). Research into crises, communication during crises, and planning for the unknown have attracted the attention of researchers and practitioners throughout the years. Within higher

education, tragic events such as September 11, 2001 or the Virginia Tech active shooter crisis of 2007 have helped shape crisis management planning on college campuses (Catullo et al., 2009). Fortunately, exponentially large number of institutions do not experience active shooting events and terrorist attacks, but these events have ensured the need to prepare for a crisis as an important job of a campus administrator at institutions across the country.

American institutions of higher education feel a responsibility to provide a safe environment for their students (Zdziarski et al., 2007). In the past, *in loco parentis*, or “in absence of parents,” has described the relationship between an institution and the students; in recent years, institutions have redefined the institution-student relationship from an ethos of care to also include a supply-and-demand relationship (Lee, 2011). The shifting demographics of incoming students leads to a shift in the demand for higher education (Grawe, 2018). As institutions do what they can to attract as many students as they can or need, the focus on campus safety may impact a student’s (consumer’s) decision on selecting an institution to attend.

In recent years, institutions of higher education have an increased focus on safety and security, which may be due to a higher perception of risk to students due to high-profile cases covered by national media (Jennings, et al., 2007). However, Pezza and Bellotti (1995) assert that situations involving safety on campuses of higher educational institutions existed as far back as in the fifteenth century, so perhaps the idea of providing feelings of safety and security for students has been there all along. Today, crisis management remains an important piece of the administrative work for colleges and university leaders in the United States due to the many potential risks of harm and responsibility to ensure the safety and security of students, faculty, and staff at the institution (Peters, 2014).



During emergency planning and preparedness at institutions, a variety of disciplines are involved, including planning theory, community relations, organizational development, human behavior, leadership, and emergency management. While past events—such as riots, shootings, or floods—have shaped the institutions of higher education's response to emergency preparedness, the threat of the current global pandemic threw institutions into the unknown during the spring of 2020. On March 6, 2020, the University of Washington became the first major university to cancel face-to-face classes and exams (Thomason, 2020). By the end of March, more than 1,000 institutions in all 50 states had followed suit (Hess, 2020).

The lack of infectious disease training for campus leaders coupled with the alarming spread and severity of COVID-19, and the scarcity of effective treatments limited the response on multiple levels within communities and campuses. With limited resources, including lack of time, institutions faced decisions that required quick turnaround and carried lasting impacts. One such decision was how to prepare for self-isolation of out-of-state and international students who were unable to travel home. Another weighted decision was how to prepare faculty and staff to work from home and teach remotely in the most effective way possible. While pandemic influenza preparedness planning is necessary at colleges and universities (Homeland Security Council, 2006), it requires extensive and focused planning at multiple levels within the organization to manage the prevention, mitigation, response, and recovery efforts throughout the pandemic emergency.

### **Statement of the Problem**

The higher education campus community has an expectation that reasonable and effective measures are in place to respond efficiently and effectively to minimize risk to students, faculty, and staff during a campus crisis, which includes a public health crisis (Heilbrun et al., 2009).

Student expectations set the relationship with their institution (Miller et al., 2006). As Heilbrun et al. (2009) note, crisis management policies and practices need to be effective and responsive.

Traditionally, institutions of higher education take a top-down leadership approach when disseminating appropriate information and emergency procedures (Clarke, 2013), which is in direct conflict with the bottom-up approach to emergency management on campuses (Coombs, 2015; Lawson, 2007). This inverted dynamic can lead to communication gaps in the campus community with regard to the importance of preparedness and response. Coombs (2007) identified three priorities to managing a crisis (in decreasing order of importance): 1.) the safety of the stakeholders or public, 2.) the financial stability of the institution, and 3.) the reputation of the institution. The prevention and minimization of damage and protecting stakeholders from adverse situation needs to be part of crisis management (Coombs, 2007).

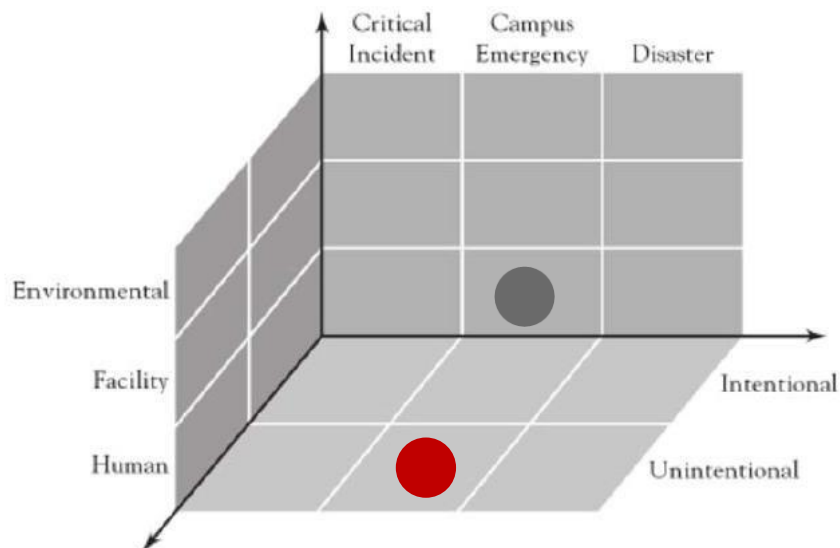
The 2020 COVID-19 global pandemic quickly and drastically shifted higher education. Prior to COVID-19, the ecosystem of the American higher education system centered on bringing students together to live and study in close proximity to each other in traditional four-year residential settings (Govindarajan & Srivastava, 2020; Korn et al., 2020). Quick decisions at the start of the pandemic led to a shift toward online course delivery and campus closures to keep the communities safe. Planning and response led to measures such as a change in hygienic behaviors for the fall (e.g., increased hand washing and wearing masks), different types of student support such as virtual tutoring and virtual campus life events, and a change in instructional mode for most institutions and students. Although some of these measures may be temporary, the long-term disruption and effects on higher education are still unknown.

Research on crisis management can group types of crises together in a variety of typologies, ranging from five clusters of crisis type (Ogrizek & Guillery, 1999) to as many as 11

(Mitroff et al., 1996). Myer et al. (2010) and Rollo and Zdziarski (2007b) suggest categorizing campus disasters into three categories: environmental or natural, human, and facility (Figure 1).

### Figure 1

*Zdziarski, Rollo, and Dunkel's crisis matrix*



*Note.* From “Campus crisis management: A comprehensive guide to planning, prevention, response, and recovery,” by E.L. Zdziarski, II, J.M. Rollo, N.W. Dunkel, and Associates (Eds.), 2007, p. 36. Copyright 2007 by Jossey-Bass.

This study focused on a campus crisis that falls into the intersection of human category and the campus emergency as a public health crisis. When translating this categorization into types of responses, campus leaders had to produce complex campus response plans that aimed to protect humans and human experiences, and to employ campus emergency plans for a prolonged period. Thus, most campus emergency plans included a broad variety of strategies, including testing mandates, masking, social isolation or distancing, and instructional modes, to name a few. Through observations of media and anecdotes, it became clear that campus emergency plans varied in stringency and implementations, where instructional mode was the only measure in the

sole power of the campus leaders and higher education governance to determine. The other measures were part of either state or federal mandates, or both. Hence, from the institutional point view, examining only instructional mode as a crisis management response potentially offers clearer implications for institutions of higher education over the areas where they hold their decision-making control during global crises.

### **Purpose of the Study**

From mass shootings to increased knowledge about pandemics, recent years have spurred a shift within institutional responses during a campus crisis. It has become part of the norm on college campuses to form emergency preparedness committees and to ensure individual offices have emergency plans in place. Campus leaders in higher education feel prepared to manage a campus crisis (Catullo et al., 2009), but a global pandemic on the same scale as the COVID-19 pandemic had not happened for more than a century.

While this study focuses solely on select institutional characteristics, higher education institutions are known to be complex organizations. As COVID-19 revealed the complexity within the higher educational institutional systems – as seen through a wide variety of institutional crisis management plans and responses to the global pandemic - the system became less predictable and even more complex with the constant changing nature of guidelines from the Centers for Disease Control and Prevention (CDC), state guidance, and the existing structures of decentralized and participatory decision-making (Kruse et al., 2020). While state politics, the demographics of enrolled students, revenue generation, peer institutions, and rates of infection in location all played a part in institutional decisions (Acton et al., 2021; Anderson et al., 2022; Collier et al., 2020; Felson & Adamczyk, 2021; Klinenberg & Startz, 2021; Whatley & Castiello-Gutiérrez, 2021), central to these institutional decisions was preserving, or at least minimizing

the disruptions to, the primary mission and purpose of higher education which includes the instruction and education of students.

Offering coursework has been central to the purpose of institutions of higher education since their inception. Before the global pandemic, scholars were stating that blended learning, or combining traditional face-to-face instruction with technology-mediated instruction, would continue to become the new normal (Graham et al., 2013; Norberg et al., 2011; Ross & Gage, 2006). During the global pandemic, mode of instruction and its variations became one of the main prongs in all campus crisis management plans in higher education nationally and, in fact, globally. Thus, instructional mode rises as one of the proxy measures of the campus crisis responses. This study seeks to find associations between instructional mode and institutional characteristics when considering instructional mode as an institutional response. In addition, this study extends its focus beyond the role of institutional characteristics in the decisions regarding instructional mode and takes the analysis further to explore whether instructional mode and institutional characteristics had associations with the reported COVID-19 cases. This association establishes the argument regarding the broader connection between instructional mode as one of the prongs of campus crisis responses and the public health crisis.

In public health, location plays a significant role in shaping environmental risks and health effects (Dummer, 2008). When leaders are looking to make an informed decision, geography plays an important context as they consider the availability of health services, location of environmental exposures, and the social environments. COVID-19 spread to a variety of geographical regions throughout 2020 at varying intensities; therefore, the geographic location determined the study sample. Chapter three discusses the location for the sample in more detail.

### **Research Questions**

This study examined mode of instructional, as one of the proxy measures of the institutional crisis responses to the COVID-19 pandemic and preparedness, at the institutions of higher education in the fall of 2020 in the Midwest:

1. What did preparedness 'look' like for COVID-19 in the fall of 2020 at four-year public and private institutions in the Midwest and Mountain regions of the United States?
2. How do institutional characteristics of institutions of higher education relate to the likelihood of a specific response of instructional mode during a public health crisis?
3. How is instructional mode related to the number of cases reported among university students and employees in all fields at four-year public and private institutions during a public health crisis?

The knowledge gained by studying these questions can inform and affect future practice for the implementation and response strategies of crisis management for institutions of higher education during a global pandemic.

### **Conceptual Framework**

Attempting to list all events that may end in a crisis can seem endless. Developing a classification system for the types of crises and responses for institutions allows administrators to conceptualize appropriate responses to these events (Zdziarski et al., 2007). In thinking of crisis response as a scalable resource, Zdziarski et al. (2007) created the crisis matrix, a conceptual model to provide a basic framework for crisis assessment ranging from determining the impact on the campus community to identifying considerations for the response. Figure 1 shows Zdziarski et al.'s three-dimensional matrix which outlines three levels of crisis (critical incidents,

campus emergencies, and disasters), types of crises (environmental, facility, and human), and the intentionality of crisis (intentional and unintentional) which determines the issues and likelihood a campus must consider in the crisis management. The red dot represents where COVID-19 fell into the matrix in the fall of 2020. In the matrix, the COVID-19 pandemic falls into the level of crisis defined as a campus emergency as it affected the entire campus operation, the type of crisis would be a human related crisis that originated with and by human beings, and the intentionality of the crisis was unintentional.

This study used critical, contemporary crisis preparedness factors to frame the inquiry around campus preparedness and campus crisis response, specifically around instructional mode, in times of crisis at higher education institutions. Furthermore, relevant themes included campus crisis management and crisis prevention. For years to come, the full impact of the COVID-19 global pandemic will be unknown. This study will be important for advancing of crisis management as effective crisis management is more than simply responding or reacting to a crisis event; it includes thoughtful, planned, and deliberate actions before, during, and after a crisis event (Zdziarski et al., 2007).

### **Definition of Terms**

- Campus Administrator: individuals who serve as the point of contact for campus crisis management (Zdziarski et al., 2007).
- Campus crisis: Defined as an event that disrupts the operation of the institution or its mission, and threatens the well-being of personnel, property, financial resources, or reputation of the institution (Zdziarski, 2006). Examples include hurricanes, power outages, terrorism, fire, rape, and suicide. This study examines actions during two

primary stages of a crisis: pre-crisis and crisis (Zdziarski, 2006). The post-crisis is still occurring (Zdziarski, 2006).

- **Coronavirus:** Coronaviruses are known to cause respiratory infections, which range from the common cold to more severe diseases such as Middle East Respiratory Syndrome (MERS) and Severe Acute Respiratory Syndrome (SARS) (CDC, 2020a; World Health Organization, 2020).
- **COVID-19:** The most recently discovered coronavirus causes the coronavirus disease COVID-19 (World Health Organization, 2020).
- **Crisis management:** The management of a crisis refers to the plans, protocols, procedures used during the management. Literature interchanges the terms “crisis management,” “emergency preparedness,” and “disaster-management” (Mitroff et al., 2006).
- **Critical indicators:** Four critical indicators in crisis preparedness of an organization are (a) the types of crises prepared for, (b) the phases of crisis prepared for, (c) the systems in place to respond to crisis, and (d) the stakeholders involved and considered in crisis preparations (Mitroff et al., 1996, as cited in Zdziarski, 2006), which relate to the four indicators to determine crisis preparedness of the colleges and universities.
- **Epidemic:** Epidemics exceed normal expectations and show an increase in the number of cases of a disease within a specific community or region (Dicker et al., 2006).
- **Pandemic:** Pandemics occur when epidemics spread over multiple countries or continents (Dicker et al., 2006).

### **Rationale for the Study**

Universities today face competition in the recruitment, enrollment, and retention of students. Students, parents, and stakeholders want to feel safe and secure on campuses; this study



supports efforts to ensure these feelings which in turn positively affect enrollment. During a campus crisis, the safety and security of students and the campus community are paramount while monitoring the situation. Without proper preparedness, the educational mission and purpose could become obfuscated while handling various situations.

The expectations of a postsecondary institution to not only provide a quality education but also to provide an assurance of safety has led to strong crisis response planning on campuses. College administrators and leaders need to add a skill of anticipation to their resume to be ready for campus crises by imagining all possible outcomes to provide the best outcome for the institution (Carey, 2006). To minimize risk, campus administrators must be proactive when responding to various acts of crisis.

Crises, such as the COVID-19 pandemic, involve discretionary decision-making by the organizational leaders (Boin & Nieuwenburg, 2013). Crises often require leaders to be the moral voices of their institution, while using the institutional core values as a guidepost (Gigliotti, 2016; St. John III & Pearson, 2016). As COVID-19 began, few leaders were adequately prepared to respond when forced to migrate online (Hess, 2020). *The Chronicle of Higher Education* (2020) may have summed up the response best when stating, “The biggest issue that college and university officials face in 2020 may be one that few of them ever thought about before” (para. 1). Minimal guidance of how institutions of higher education should respond to crisis (CDC, 2020b; Gigliotti, 2016; Moerschell & Novak, 2020) and the lack of research on integrating ethical decision-making into crisis management (Sellnow & Seeger, 2020; St. John III & Pearson, 2016) did not set a positive stage for campus leaders to know how to best respond.

### **Significance of the Study**

With the enrollment competition, prospective students and their families, current students and their families, and other stakeholders may view institutions that act efficiently and effectively to ensure the safety of their students as positive places to attend. While past events such as school shootings or weather-related events have pushed campus administration to work towards emergency preparedness, a global pandemic once again challenges the reactivity of campuses across the globe.

Campus leaders must critically consider the possibilities that may occur and have a plan in place to handle situations that may arise, rather than waiting to be reactive during the crisis. As risk of litigation against institutions continues to remain relevant, campus administrators must work to ensure they take significant care in reviewing and practicing the plans in place. Responses should be well organized, well planned, and appropriate for the situation to ensure the future of the institution. Campus administrators must be knowledgeable and prepared to deal with several different crises for the safety of students, faculty, and staff and to avoid litigation.

### **Methodological Overview**

This exploratory study sought to understand the factors shaping the COVID-19 response at four-year public institutions in the Midwest and Mountain regions of United States during the fall 2020 term. While this study supplemented the current literature on campus crisis management in higher education, there is still a limited amount of literature pertaining to institutions that focuses on the effectiveness of the response and the analysis of the successes and failures of their plans, especially around pandemics.

Research question one was a demographic review of institutional response, primarily focusing on the instructional mode as a proxy for institutional response. Research questions two

and three focused on key variables outlining institutional characteristics, including instructional mode as a means of identifying institutional response. A multinomial logistic regression analyzed research question two while a negative binomial regression with an estimated parameter dispersion factor provided an analysis for research question three.

### **Organization of the Document**

The five chapters in this dissertation support the study and findings. The first two chapters, the introduction and the literature review, provide an overview of the relevant literature and scope of the project. This foundation provides an overarching understanding for the project. Chapter one describes the need and purpose of the research, while introducing the research questions. Chapter two examines the relevant literature related to crisis management, emergency preparedness specific to higher education, leadership in emergency situations, communications, and current practices during campus crises. The third chapter discusses the methodology used in this study, including defining the sample population and study setting, defining the variables, and providing a summary of the intended analysis. Chapter four reveals the results of the study, and chapter five provides a narrative discussion to provide recommendations for future study, implications for research and practice for campus administrators to plan for campus crisis effectively and efficiently, and limitations of the study.

### **Summary**

The purpose of this exploratory study was to study relationships between characteristics of institutions of higher education that may be helpful for future campus decisions during campus crises and to start to fill the gaps in the literature on crisis that fit in the unintentional, human, campus emergency crises. By analyzing the data, this information provided a useful baseline for institutions to continue to ensure their response to a campus crisis meet the

expectations of the campus community. The information collected is also a useful indicator for the institutional leaders on the effectiveness of instructional delivery methods as they review what the response to the pandemic was. The findings are helpful in achieving a greater understanding of the elements of an effective and efficient crisis management plan.

It is critical to anticipate the need for scenarios such as COVID-19 and other global health scares, so institutions can present a solid plan before, during, and after the event. By examining the development and outcomes of the COVID-19 pandemic at universities, exploring the relevant literature of theory and practice regarding campus crises, and analyzing the data collected, the goal of the study was to provide information to better protect institutions and the campus communities during an infectious global pandemic.

## CHAPTER II

### Review of Literature

College and university administrators understand they are not immune to crises (Griffin, 2007; Mitroff & Anagnos, 2001). When a campus crisis strikes, disruptions to the university's educational process and operations are typical. There are many ways to analyze crises on college campuses, including through counseling, sociology, higher education, business, psychology, and law. This study examined campus crises in the context of crisis management, leadership response, and communication within higher education administration.

For more than 30 years, scholars from sociology, psychology, public health, and higher education have been researching aspects of school crises (e.g. Haddow & Bullock, 2003; Kezar, 2001; Quarantelli, 1977). Many institutions post informative and instructive emergency plan response information on their websites which direct students, faculty, and staff toward actions to take during an emergency. While some schools can subscribe to an "all hazards" approach relying on less specific preparation, others subscribe to an "incident command" model laying out distinct chains of command and specific responses for various emergencies.

The term 'crisis' historically has a broad definition. Institutions must begin by defining what *crisis* means for them before creating and implementing a crisis plan. Creating a standard definition of *crisis* can be challenging because of the complexity surrounding circumstantial situations. Institutions of higher education have a variety of individual characteristics, so institutions may each define crisis differently to represent their location, institution type and size, and culture. These definitions significantly impact the creation and implementation of a crisis management plan (Zdziarski et al., 2007). Thus, 'crisis' definitions vary significantly from one institution to another.

For this study, a crisis is: “an event, which is often sudden or unexpected, that disrupts the normal operations of the institution or its educational mission and threatens the well-being of personnel, property, financial resources, and/or reputation of the institution (Zdziarski, 2006, p. 5).” This definition stems from common characteristics found in a wide range of crisis definitions. It includes Steven Fink’s (1986), sometimes referred to as the father of modern crisis management theory, idea of a crisis having either a desirable or undesirable outcome, Hermann’s (1963) and Coombs’ (2015) element of surprise and unpredictability, and Seymour and Moore’s (2000) interruption of operations.

### **Pivotal Higher Education Studies**

Previous studies in crisis management at institutions of higher education can provide an overview during planning for other institutions' own crises. Additionally, these studies set the stage for administrators' perceptions prior to the COVID-19 pandemic.

Zdziarski’s 2001 study, *Institutional Preparedness to Respond to Campus Crises as Perceived by Student Affairs Administrators in Selected NASPA Member Institutions*, provided a quantitative review of 155 institutions, all members of the non-profit professional development organization of the National Association of Student Personnel Administrators (NASPA). Primarily focusing on institutional preparedness in four crisis areas: natural, facility, criminal, and human, Zdziarski analyzed responses from pre-crisis, crisis, and post-crisis perspective. The broad results helped identify a baseline for the number of institutions with a crisis management plan in place. These results standardized coordinator positions, created a baseline standard age of a crisis management plan, identified how institutions communicated plan, the evaluation or audit of plans, and who the stakeholders were in crisis management planning. From the results,

Zdziarski outlined four main outcomes from the study that could serve as benchmarks for future studies in crisis management and responses within higher education:

- 1) Crisis management plans should have more audits. Zdziarski (2001) reported only 20% of institutions audited their crisis plans.
- 2) Current practices are in a reactive mode, but ideally would be in a proactive mode. Zdziarski (2001) reported that 70% of institutions use an “on-call” or “duty” system to evaluate effectiveness.
- 3) Despite being an effective form of crisis preparedness, using crisis exercises and simulations in training was not prevalent. Training for the crisis management team is important.
- 4) Institutional size impacted the level of preparedness. Zdziarski (2001) reported that larger institutions more often had a written crisis management plan.

Catullo (2008) completed a follow-up study to Zdziarski’s (2001) research: *Post-September 11 through Pre-Virginia Tech Massacre, April 16, 2007: The Status of Crisis Management Preparedness as Perceived by University Student Affairs Administrators in Selected NASPA Member Institutions*. Based on an analysis of responses for changes since the Zdziarski study, this study determined increased attention on levels of preparedness, yet residential campuses' preparedness for crisis was unknown. This study emphasized the importance of institutions having a written plan, training for the campus, the involvement of various representatives, and including more than one contingency plan for each crisis category. The study further indicated an improvement for the crisis and post-crisis modes, but not in the pre-crisis mode, once again indicating that most plans are reactive instead of proactive.

Aker's (2007) mixed methods study, *Evolution of Emergency Operations Strategies: Structure and Process of Crisis Response in College Student Affairs*, provided insight for institutions located "near imminent threats to public safety due to close proximities to coastal areas, large metropolitan areas, and areas at threat of earthquakes or if they had recent occurrences of campus crisis." Regardless of the size of the institution, Akers (2007) found preparedness at institutions varied and a need for the use of training activities such as simulated exercises, case studies, drills, educational programming, and safety awareness. The study found institutions had improved communicating information using technology (e-mail alerts, text messages, emergency light/call boxes, etc.). Also, the study corroborated Zdziarski's (2001) conclusion that regardless of the size, preparation is key for an effective crisis response. Akers (2007) found that institutional size did have an impact on crisis response. While larger institutions may have greater resources, they also must manage larger crowds and complex communications with various stakeholders.

Finally, in 2012, Lott provided the study, *Crisis Management Plans in Higher Education: Commonalities, Attributes, and Perceived Effectiveness*. This qualitative study of five institutions of the Consortium of Universities of the Washington Metropolitan Area indicated the following:

- The need for increased communication at all levels within the sample institutions;
- The need for feedback opportunities when establishing procedures for all members of the campuses;
- The need to increase the number of relevant updates from administration if/when crises occur;
- The need to increase training workshops, drills, and evaluation protocols; and,



- The need to improve visual media and mixed-media messages for consumers of the various alert system technologies.

These studies provided a benchmark for higher education leaders when creating, reviewing, revising, and evaluating their crisis management plan.

### **Developing Studies on COVID-19**

With the concerns lost revenues and the mid-March 2020 Moody's Investors Service outlook downgrade from stable to negative (Hartocollis, 2020), institutions faced decisions on how to safely reopen amidst projected budget shortfalls. The lack of a national system meant institutions relied on their own experts and had a wide variety of approaches ranging from asking students to take all or some online courses to testing the campus community three times a week (Marris, 2020). Bahl et al. (2021) ran several models and suggested that safe reopening would require the administration to produce strong policies, such as weekly screening tests and halving the student population and cautious behavior from students, including wearing facemasks, less socializing, and participating in COVID testing.

Collier et al. (2020) studied the impacts of state politics, student demographics which included the number of enrolled white students and collegiate sport conferences, and local COVID-19 rates as institutions made decisions on how to provide instruction for fall 2020. Findings indicated that states with Republican governors and Republican-controlled legislatures increased the likelihood that campuses would choose in-person instruction, at both public and private institutions (Collier et al., 2020). In addition, institutions located in cities and states with high Republican votes in 2016 were more likely to re-open in-person (Felson & Adamczyk, 2021). Private institutions with more international students were more likely to reopen with in-person classes in fall 2020 (Whatley & Castiello-Gutiérrez, 2021). Institutions with higher

proportions of revenue generated by in-person activities, such as residence halls and dining halls, led schools to reopen with in-person instructional mode (Klinenberg & Startz, 2021). Colleges opening with in-person instruction increased local COVID-19 cases (Anderson et al., 2022). Leidner et al. (2020) reports a 56% increase in COVID-19 incidence for counties with a university, and a 6% incidence decrease for counties without large colleges or universities at the start of the semester.

Campuses serving a higher number of white students were more likely to choose online instruction, and surprisingly, county case rates per capita were not a strong piece of the decision-making process (Collier et al., 2020). Major predictors for institutions adopting online or hybrid instructional modes also included larger enrollments, greater endowments, individual masking policies, and fewer Republican votes (Badruddoza & Amin, 2020). Since large classes act as hubs for students from various departments to interact with each other, Kharkwal et al. (2021) modeled scenarios and found restricting class size can decrease the number infected more than 70% and suggested that avoiding large classes could be very effective in controlling the spread of the disease.

### **Managing Crisis in Higher Education**

Crisis management encompasses all activities of preparing for and responding to a significant event (Zdziarski et al., 2007). An important piece of crisis management is that it involves more than simply a preparedness plan (Mitroff et al., 2006). Crisis management in practice is comprised of various acts that institutions must consider, including communication, plans, and teams.

Prior to the terrorist attack on September 11, 2001, most research in crisis management focused on the corporate sector (Coombs, 2015; Mitroff et al., 2006). However, after the

September 11, 2001 attacks, the Virginia Tech Massacre in April 2007, and the natural disaster hurricanes Katrina and Rita in 2007, research expanded into managing crisis on college campuses (Catullo, 2008). For higher education, crisis management must include a wide array of types of crises and include a continuous improvement model to reduce weaknesses in the system.

Higher education institutions are complex organizations, but Mitroff et al. (2006) found that most are prepared for physical disasters instead of the broad scope of crises. The *Report of the Virginia Tech Review Panel* (2007) motivated institutions to review crisis plans, federal and state laws concerning privacy of health and educational records, and to examine the coordination of various departments. The hurricane season of 2007 encouraged institutions to review planning as it pertains to weather related crises (Lipka, 2005; Mitroff et al, 2006). In response to national disasters, institutions created continuity of operation plans and emergency response teams or crisis management teams (Mitroff et al., 2006). However, institutions must continue to plan beyond singular catastrophes and include a multi-departmental crisis management team with support from administration (Mitroff et al., 2006).

Previous studies indicated institutional type may result in differences in perceptions of preparedness for campus crises. Zdziarski (2001)'s study indicated a high level of perceived preparedness (overall mean of 7.79/10) for campus crisis. Private institutions rated their level of preparedness higher than public institutions (Catullo et al., 2009; Covington, 2013; Zdziarski, 2001). Also, larger institutions were more likely to have reviewed campus safety procedures than smaller institutions (Rasmussen & Johnson, 2008).

### **Phased Approaches to Crisis Management**

Crisis management literature frequently refers to phased approaches in crisis response (Coombs, 2015; FEMA, 2019; Mitroff et al, 1996; Zdziarski et al., 2007). Considering crisis

management as a process rather than simply a response allows administrators to act prior to an actual crisis. Haddow and Bullock (2003) found that effective emergency preparedness called for a systematic approach to planning and requires ties to academic research traditions and analytical methodologies. These ties allowed the efforts of multiple agencies responding to crises to coordinate with each other. There are three straightforward phases in a crisis management cycle: 1) pre-crisis, or actions taken before the onset of a crisis, 2) the crisis, or actions taken during the crisis, and 3) post-crisis, or actions taken after a crisis (Zdziarski et al, 2007). When considering effective crisis management, administrators must consider thoughtful, planned, and deliberated actions during each stage of the cycle (before, during, and after a crisis) (Zdziarski et al, 2007).

Federal, state, and local emergency management professionals are often familiar with the Federal Emergency Management Agency (FEMA)'s systematic approach to emergency preparedness with two cyclical planning processes (Haddock & Bullock, 2003). The four-part outer cycle outlines planning, preparation, evaluation and assessment while the inner cycle has seven detailed steps of assessing the threat, gauging vulnerabilities, identifying shortfalls, planning improvements, training responders, conducting drills, re-assessing the preparedness, and beginning the cycle again as needed (FEMA, 2019). Institutions may find it useful to align the pre-, during, and post-crisis phases with FEMA's approach if they must work with local or state agencies.

### **Crisis Communication**

For leading successful crisis management, timely and accurate communication is key during the response. Internal communication between the emergency response personal to the campus crisis response team and external communication to the campus constituents and stakeholders are critical for the decision making within a crisis (Paterson, 2006). In recent years,

technology has assisted in the crisis communication, between team members and constituents (Coombs, 2015; Paterson, 2006). Accuracy of information sets the tone and level of trust with the campus community and within the decision-making process for the response team (Lott, 2012).

Effective crisis communication identifies target audiences and considers the impact a crisis may have on those audiences (Lawson, 2007). In today's world, digital means allow for multiple actors to spread messages (van der Meer, 2016). Websites, emergency alert/response systems, texting, social media, and email provide diverse means for different target audiences (Lawson, 2007). Liu and Kim (2011) examined the flow of communication during a crisis, along with the interplay between traditional media outlets and social media during the 2009 H1N1 pandemic and found traditional media outlets framed the crisis more often than social media outlets. This pandemic also provided new technological advances for communication, such as a blog at The Ohio State University to answer student questions and update information quickly (Schnirring, 2010).

During the initial wave of the COVID-19 pandemic, news media outlets focused on higher education from the start. Higher education news sites, such as the *Chronicle of Higher Education* and *Insider Higher Ed*, created Coronavirus live updates, institutional closing information, and daily articles on the response of institutions. Administrators at institutions kept information up-to-date and accurate, eased apprehension, made decisions promptly and tracked the relevant information for each stakeholder group to communicate. A fundamental factor within crisis management is communication and the interactions with the stakeholders; if the communication is inefficient so will the crisis management efforts be (Coombs, 2015).

### **Crisis Management Plans**

Higher education institutions vary in size, technological abilities, and design, making it nearly impossible to create a template for a campus crisis management plan (Smits & Ally, 2003). While previous studies (Akers, 2007; Catullo, 2008; Lott, 2012; Zdziarski, 2001) indicated that around 85 percent of institutions surveyed have a written crisis management plan, that left 15 percent of institutions without a plan. Rollo and Zdziarski (2007a) indicate that “the existence of a written crisis management plan is perhaps the single most important crisis management tool a campus can have (p. 74).” In providing the foundation and framework, a plan could provide clarity and consistency for campuses (Rollo & Zdziarski, 2007a).

Involving key stakeholders and considering the various types of events that may occur is the start to creating an effective plan (Rollo & Zdziarski, 2007a). While there is no cookie-cutter template for campus crisis management plans, Rollo and Zdziarski (2007a) posit that a good crisis management plan has two fundamental parts: the basic plan and a set of protocols for a crisis. The basic plan should state the purpose, outline the activation circumstances, delegate the lines of authority, and provide significant action steps to take during a crisis (Rollo & Zdziarski, 2007a). The protocols for crisis provide campuses an opportunity to outline specific checklists for specific events. Rollo and Zdziarski (2007a) indicated addressing crisis events that have the greatest possibility of occurring on a campus is ideal.

### **Crisis Management Teams**

In reviewing the literature, effective pieces of the crisis management process included a crucial need to create appropriate crisis management teams with a wide array of professional positions (Mitroff et al., 2006; Sherwood & McKelfresh, 2007; Zdziarski, 2006). These teams protect the core assets, people, finance, and reputation, of an institution, and many institutions

have expanded the roles of the teams to include coordinating proactive preparedness activities such as educational programming on risk management and prevention and the evaluation after an incident (Sherwood & McKelfresh, 2007).

Institutions typically build their teams with chief business officers, chief administrative officers, chief student affairs officer, legal counsel, human resources officer, chief security officers, public relations/information officers, directors of housing/residence life, and directors of health/counseling services (Sherwood & McKelfresh, 2007). When creating a campus crisis management team, Sherwood and McKelfresh (2007) present several criteria that influence the representatives. Institutional size may dictate an additional need to partner with community agencies, such as mental health or emergency response professionals, since small institutions may have limited resources (Sherwood & McKelfresh, 2007). Location of campuses may also determine the risk level for certain disasters (flood risk, security risks, etc.) (Sherwood & McKelfresh, 2007). The skills necessary for a Campus Management team include availability, knowledge of resources, team player mindsets, trainability, diversity-communication skills, and assessment skills (Sherwood & McKelfresh, 2007). Creating flexible teams to make decisions in typically fast-paced experiences means trust is important for these teams (Sherwood & McKelfresh, 2007).

### **Institutions and Pandemics**

The higher education response to COVID-19 may seem unprecedented to some, however, pandemics are not new. A history of institutional responses exists and allow for examination of previous campus closures, cancelled classes, and quarantine procedures.

**The Plague: Quarantines away from campus**

The Bubonic Plague, or Black Death, of the 14<sup>th</sup> century struck Europe and killed around half the population (Seven, 2020). At the University of Oxford in England, students and faculty took to leaving the institution quickly, using ‘escape plans’ to retreat to countryside manors for continuing education (Courtenay, 1980). The Plague continued to ravage England around every ten years from 1348 to 1665 (Roos, 2020), and university students continued to take to these retreats as an action to protect themselves. In 1665, a student at the University of Cambridge in England named Isaac Newton escaped to his countryside childhood home to avoid the plague (McDonald, 2020). During this year away from the institution, he developed theories in differential and integral calculus, formulated a theory of gravity, and explored optics. This time became known as his “year of wonders” (McDonald, 2020).

**Smallpox, Cholera, Typhoid, and Yellow Fever Epidemics: Campus Closures, Isolation Units and Required Vaccinations**

In 1721, a smallpox epidemic reached Harvard University in Cambridge, Massachusetts, United States and started a debate between the then new strategy of vaccination and the opposing theology-sided team (Burton, 2001). The thirteen students who volunteered for inoculation survived, but later outbreaks required all students to leave campus (Sapiro, 2020). Burton (2001) emphasized the importance of the cooperative agreements between the institution (Harvard) and the city (Cambridge) in resisting smallpox epidemics.

These epidemics not only led to debates but also to campus relocations and closures. Such instances are evident among colleges and universities in the United States. Yellow Fever broke out several times in the 1800’s and 1900’s, impacting institutions such as Beaufort College (now the University of South Carolina – Beaufort-Bluffton) in Bluffton in South Carolina whose



community razed the original main building in 1817 out of fear that the epidemic started in the building (Rowland, 2000). Colleges presented a unique issue during pandemics, as going to college meant traveling or crossing quarantine lines to attend classes and gathering together in lecture halls, chapels, dining halls, and residence halls (Thomas & Foster, 2020). During the 1878 outbreak of yellow fever, most institutions that had no system in place for caring or monitoring student health regulated the control to local authorities, created quick quarantines, delayed the start and/or remained closed (Thomas & Foster, 2020).

Cholera caused the deaths of three college students at Indiana College (now Indiana University in Bloomington, Indiana, United States) in 1833, and in 1849 hit Hanover College in Indiana killing three students and the President, Sylvester Scovel, which forced the institution to close for several weeks (Daly, 2008). Typhoid fever in 1856 closed Hollins University (then Hollins Institute in Roanoke in Virginia for two years (Smith, 1921). Typhoid fever also led to several student deaths in 1874 at the Mansfield Normal School (now Mansfield University in Pennsylvania) (Mansfield University, 2020). In 1899, the deaths of 13 students and a staff member at the North Carolina State Normal and Industrial College (now University of North Carolina at Greensboro) subsequently lead to the school's closure for two months (Mulligan, 2012). Additionally, linking the campus water infrastructure to the city water system added protection from future outbreaks (Mulligan, 2012).

In the United States, student health in the 1800's focused primarily on intercollegiate athletics, but by the latter half of the century some institutions began to establish infirmaries, particularly to care for and isolate students with communicable diseases (Turner & Hurley, 2002). Typhoid epidemics continued to plague institutions throughout the early 1900s which resulted in the creation of comprehensive student health programs (Turner & Hurley, 2002). As

medical advancements improved the control of epidemics, pre-matriculation immunization requirements became the norm by the mid-1960's (Turner & Hurley, 2002).

### **1918 Influenza Pandemic: Isolation and Face Masks**

As college and universities worked to support efforts around World War I in 1918, they faced numerous changes and challenges, such as declining enrollments, shrinking budgets, and an increasingly militaristic social and academic culture. A number of historical narratives about higher education during this time period (e.g. Bastedo et al.; Labaree, 2017) focused on the impact of the merging of the traditional laissez faire academic culture with the highly structured military culture, but most ignored the impact of the 1918 (also known as Spanish) flu epidemic on collegiate campuses.

By many popular accounts, college campuses were places of great activity. Prospective students flocked to join the United States in World War I, leaving universities with the fear of declining enrollments. Looking to the government for help, educators lobbied to keep students interested in higher education. After the creation of the Student Army Training Corps (SATC), college campuses became similar to army training camps and in turn, enrollment increased (Ceremonies to mark S.A.T.C. organization, 1918). During the last months of 1918, the 1918 flu struck students across the United States from Yale University in New Haven, Connecticut to the University of Washington in Seattle. The University of North Dakota (UND) in Grand Forks reported being one of the hardest hit institutions with nine student deaths and more than 60 percent of the student body infected with the illness (Geiger, 1958).

A review of what happened at UND provides an in-depth look at how an institution's response plan for a global pandemic influences outcomes. The SATC quarantined the campus on October 8, 1918 (Close classes, 1918, p. 8; Public gatherings, 1918; Quarantine at "U", 1918, p.

5 ). The institution recorded the first case of a student afflicted with the virus on October 9, 1918 (Geiger, 1958). Yet, by the end of the month, the disease had almost completely vanished from the area, leaving a campus to deal with the deaths of several students and a lost academic quarter (Geiger, 1958).

The significance of the 1918 flu epidemic on college campuses is an ideal case study in institutional response to a global pandemic. The 1918 epidemic altered collegiate life for many students as it caused a number of institutions to, in most cases, quarantine the campus and in some cases halt instruction for a number of weeks (Bowman, 2020; Cozens, 2020; Jensen, 2020; Stout, 2020; Wong, 2020). The outbreak that occurred during the First World War resulted in somewhere between 20 to 100 million worldwide deaths and around 650,000 deaths within the United States (Crosby, 2003). College administrators faced life and death decisions about student, faculty and staff lives, making and executing decisions with little time for contemplation as one of the worst health crises of the 20th century ran its course in less than a month.

With colleges and university responding to the 1918 flu based on local health boards, government policies, location, stakeholders, and the impact on campus life, it is clear that institutions did not respond collectively but within their own time and context (Thomas & Foster, 2020). While institutional leaders faced challenges, including their own bouts with the virus, some institutions took an active role in supporting local health initiatives, such as home economic and extension staff or student clubs working in local hospital kitchens or providing meals (Thomas & Foster, 2020). The 1918 flu pandemic began shifting the role colleges and universities had in their communities during a pandemic by applying their expertise while honoring local health rules instead of simply managing with delayed openings or quarantines (Thomas & Foster, 2020).

**1957, 1968, and 1977 Influenza Pandemics: School Absenteeism**

Influenza circulates throughout the world population continuously and remains a major cause of illness and mortality (Nichol et al., 2010). Traditional college age students are not typically in the high priority groups for influenza vaccines, but there is an increased risk for outbreaks in which students experience substantial illness for eight or more days on college campuses (Nichol et al., 2010). The American College Health Association reports that only 54.8 percent of college students report receiving the flu vaccination in the last 12 months (ACHA, 2021). More than 50 percent of the college students who reported experiencing the flu (influenza or flu-like illnesses) said it negatively impacted their academic performance (ACHA, 2021).

A similar, almost identical virus to the 1918 flu created emerged in 1957-1958 at the beginning of the study of viruses (Taubenberger & Morens, 2010). Institutions such as Mount Holyoke in South Hadley, Massachusetts in the United States began quarantines, and students remember decimated classes with many students out sick (Kelly, 2020). The fall and early winter of 1968-1969 had an outbreak of a highly contagious influenza A (H3N2) virus (Taubenberger & Morens, 2010). While this particular strain's mortality rate was not as impressive as the 1918 epidemic, there was significant excess pneumonia-influenza mortality in all geographical areas of the United States (Sharrar, 1969). By December 1968, one or more institutions of higher education in 22 states had dismissed students early for the winter/holiday break, and two colleges remained closed in January of 1969 (Sharrar, 1969).

In the winter of 1978, another pandemic was quickly spreading around the world and had a high incidence in schools with students in residence (Sobal & Loveland, 1982). While infection rates were high for all students, one study points to higher rates for students living on campus (Pons et al., 1980). Pons et al (1980) indicated that transmission of the virus occurred primarily

through daytime activities, including classes, and attributed the higher rate for residential students to more exposure in the evenings. On one large urban campus, the flu spread primarily on a weekend, resulting in 62.3 percent of students but only 9.4 percent of the faculty members reporting the disease (Layde et al., 1980). Study findings indicated that students missed two days of school on average, but one week after the initial onset weekend, the institution moved to a full suspension of classes (Layde et al., 1980).

The outbreaks leading to school absenteeism indicate a need for institutions to plan how to reduce the number of days missed. Nicol et al. (2010) modeled scenarios on college campuses and found implementing holidays/breaks into the academic calendar along with the pre-season vaccination campaign and a delayed vaccination campaign would be useful in preventing influenza pandemics on college campuses.

### **H1N1 2009 Pandemic: Care on Campus**

The 2009 H1N1 pandemic was the first global pandemic in 41 years, and those tasked with leading the crisis had to keep the public informed and engaged during a multi-month health crisis. Declaring the pandemic in early June allowed colleges and universities to have time to prepare for the fall (CIDRAP, 2010). Institutions concentrated on shifting their pandemic plans (based primarily on the 1918 scenario of evacuating campus with a large number of student deaths) to focus on the 2009 pandemic attributes. While this pandemic did not indicate it would result in many deaths, it did threaten that a large number of students could fall ill and that institutions may need to provide care for the many students likely to become sick (Elsen, 2009). Institutions planned for providing food and hydration to sick students, isolation for ill students, and cancelling or suspending classes. The CDC recommended providing education about the flu virus and a seven-day isolation (Elsen, 2009).

By the end of the fall 2009 semester, a report of the “Big 10 + 2” universities during the pandemic by the University of Minnesota Center for Infectious Disease Research and Policy (CIDRAP) indicated that preparedness planning paid off (Schnirring, 2010). Nine main topics provided the baseline for gathering information which led to four overarching lessons for pandemic planning: 1.) build and sustain partnerships, 2.) cast a wide net for resources, 3.) build flexibility into response plans, and 4.) tackle remaining challenges now (CIDRAP, 2010). A key lesson found that pre-pandemic planning was useful, not only for the process itself, but to produce strong multidisciplinary teams to solve problems, adjust quickly, and provide strong support from the university (Schnirring, 2010). Challenges included isolating sick students and managing student absences, however the students themselves provided an invaluable resource in providing alternative ideas, building community partnerships, and caring for peers (Schnirring, 2010).

### **COVID-19: Diving into the Unknown**

The 2020 COVID-19 pandemic created momentous challenges for institutions of higher education with relatively little warning (Kruse et al., 2020). As institutional leaders applied guiding principles to their decision making (Liu et al., 2021), it became obvious that this crisis was not a one-time situation. Rather, the long duration and uncertain nature of the crisis has allowed a number of influences and changes to decisions throughout the pandemic. Current studies on the on-going pandemic can shed light on future research to better assist campus leaders to be better prepared for the next pandemic or similar crisis.

Studying how leaders use values during uncertain times, Liu et al. (2021) posits that infusing shared values into crisis planning would be beneficial as stakeholders may lose trust in organizational leaders (Dirks & Ferrin, 2002). With prior research supporting the idea of ethics at

the heart of crisis management, Liu et al. (2021) found that due to the long-haul nature of the COVID-19 crisis, leadership turned away from established crisis plans after the early phases of the pandemic and turned to staying true to their missions and values.

Since March 2020, institutions across the United States have operated with diminished resources, while attempting to maintain instructional quality which, in some cases, has led to restructuring (Kruse et al., 2020). As the landscape evolved from the rapid-fire decision-making in spring 2020 which kept the health and safety of the students, faculty, and staff at the forefront to scenario planning in the summer/fall of 2020 which considered longer-term impacts on campuses, uncertain administrators were planning for forecasted enrollment declines and budgetary concerns (Grawe, 2018). The financial impacts for U.S. education remained negatively impacted by the Great Recession (Laderman & Weeden, 2020), and it was unclear if students would be able to afford college with unemployment skyrocketing and primarily online coursework. A recent working paper indicated students may have been willing to pay more for the in-person experience (Aucejo et al., 2021) which required institutions to consider all angles when making operation decisions during the pandemic.

Klineberg & Startz (2021) found public and private institutions responded differently. Political pressures and the number of out-of-state students included public institutions, while private institutions responded more to the severity of COVID in their local community. Acton et al. (2021) studied the influence of peer institutions on colleges' decisions to reopen in the fall of 2020, and results indicated that peer institutions were more influential in determining how the institutions would offer instruction in fall 2020 than county-level COVID-19 deaths.

Knowing now that institutions' reopening plans impacted the spread of COVID-19 in communities with colleges that opened in-person increased local incidence by .024 cases per

1,000 residences (Anderson et al., 2022), the question of why some institutions chose to return to in-person instruction while others chose to remain online remains relevant. The choice between in-person instruction which presented real and uncertain health risks and online instruction which limited student experiences and potentially reduce revenue for the institution and the local community was difficult.

### **Summary**

This chapter reviewed the definitions of crisis, pivotal studies in college crisis management, managing crisis in higher education, current practices in campus crisis management, and the history of pandemics and institutions of higher education. The literature outlined the following indicators for crisis preparedness: 1) a crisis management plan is in place, addressing each major crisis category, 2) these plans address and prepare institutions for the different phases of crisis, 3) there are organizational systems that support a crisis management program, and 4) the plan involves the stakeholders in the planning process for a crisis (Zdziarski, 2001). In addition, institutional size, location of campus, campus setting of rural versus urban, and locus of control were all identified as relevant factors from the literature.



## **CHAPTER III**

### **Methodology**

The purpose of this exploratory study was to study relationships between characteristics of institutions of higher education that may be helpful for future campus decisions during campus crises and to start to fill the gaps in the literature on crisis that fit in the unintentional, human, campus emergency crises. Using instructional mode as one measure of institutional response, this study sought to help fill the gaps in the literature for institutions in crisis management mode and to supplement the crisis management research work in higher education. This chapter delineates the research questions, provides an overview of the sample population, describes the research design, and discusses the methods for data collection and analysis.

### **Research Questions**

This study answered the following research questions:

1. What did preparedness ‘look’ like for COVID-19 in the fall of 2020 at four-year public and private institutions in the Midwest and Mountain regions of the United States?
2. How did institutional characteristics of institutions of higher education relate to the likelihood of a specific response of instructional mode during a public health crisis?
3. How was instructional mode related to the number of cases reported among university students and employees in all fields at four-year public and private institutions during a public health crisis?

### **Research Design**

This study employed quantitative research methods, specifically using publicly available data from three primary sources: the College Crisis Initiative, or C2i, which captured the

instructional mode for institutions across the United States and placed the mode into seven categories: fully online, primarily online, hybrid, primarily in-person, fully in-person, TBD, other; data obtained from the New York Times developer portal Coronavirus (COVID-19) data which recorded the number of reported cases for each institution across the US; and integrated post-secondary education data system, or IPEDS.

Research question one included a demographic review of institutional response. Research questions two and three focused on key variables related to institutional characteristics, using instructional mode as a measure of institutional response to the crisis.

### **Participants and Setting**

#### **Population**

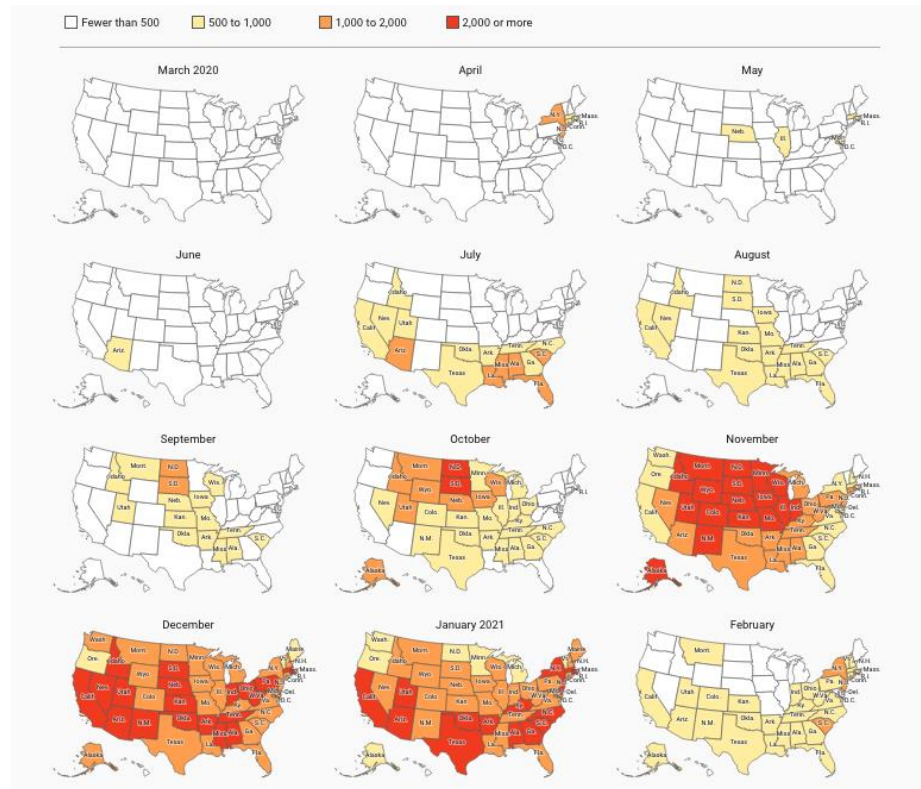
The population included four-year institutions, both private and public, in the Midwest and West (Mountain) section of the US (defined by the US Census). These universities met the following criteria: 1.) awarded bachelor's degrees or higher and 2.) were not-for-profit institutions. The Integrated Postsecondary Education Data System (IPEDS) institutional type identified the institutions included in the study.

#### **Sample**

In recognition of the nature of the COVID-19 virus, which spread to various regions at varying intensities throughout the year, the study used a specific time frame. Based on the spread of COVID-19 for the fall of 2020, figure 2 indicates the states with the most new cases per 100,000 residents. It shows the Midwest and West (Mountain) regions with the most cases during November of 2021. Therefore, the study selected the dates of November 5, 2020 to November 19, 2020 as the timeframe, with the instructional mode captured at the start of the time frame.

**Figure 2**

*U.S. states with most new cases per 100,000 residents*



*Note.* From Fey, W.H. (2020). One year in, COVID-19’s uneven spread across the US continues.

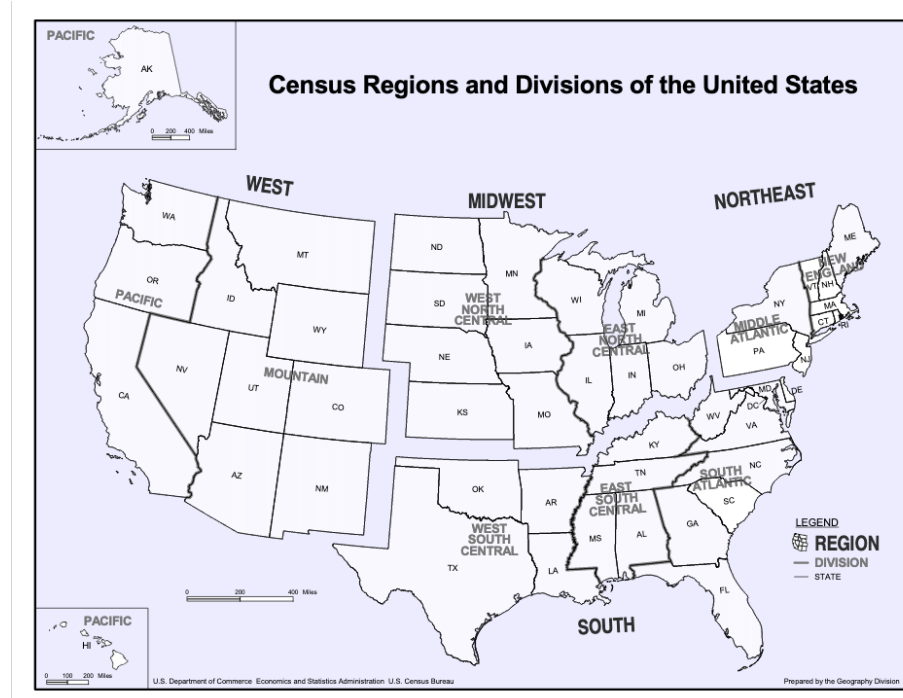
<https://www.brookings.edu/research/one-year-in-covid-19s-uneven-spread-across-the-us-continues/>

The instructional modes for the sample came from the College Crisis Initiative, or C2i, database which tracked around 3,000 U.S. colleges, community colleges, and universities and instructional mode throughout the fall 2020 semester (Marsicano et al., 2020). After combining the C2i data with the New York Times developer portal Coronavirus (COVID-19) data to provide the number of reported COVID-19 cases at institutions, the location further narrowed the sample based on the US Census regions of the Midwest (West North Central and East North Central) region and the West (Mountain) region.

There were 729 institutions that fit the criteria to be in the study. After removing institutions with missing variables, the sample for the study consisted of 434 institutions. Figure 3 indicates the states included for this sample while Table 1 outlines the number of institutions per state that meet the population criteria for a total of 434 institutions included in this study.

**Figure 3**

*U.S. census regions and divisions of the United States*



*Note.* From U.S. Census Bureau. (2010). U.S. Department of Commerce Economics and Statistics Administration. [https://www2.census.gov/geo/pdfs/maps-data/maps/reference/us\\_regdiv.pdf](https://www2.census.gov/geo/pdfs/maps-data/maps/reference/us_regdiv.pdf).

**Table 1***Sample universities and colleges by state*

State	Number of Colleges/Universities
Arizona	5
Colorado	25
Idaho	8
Illinois	45
Indiana	34
Iowa	24
Kansas	18
Michigan	43
Minnesota	32
Missouri	32
Montana	10
Nebraska	12
Nevada	7
New Mexico	9
North Dakota	10
Ohio	67
South Dakota	11
Utah	9
Wisconsin	32
Wyoming	1
Total	434

*Note:* From U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS). (2019). <https://nces.ed.gov/ipeds/>.

### **Confidentiality and Data Storage**

As part of assessing the risk for institutions and considering the needs of the population, the researcher completed the University of North Dakota (UND) IRB Application for Secondary Research Involving Data, Records, and/or Biospecimens. The data collected was all public information found on the various websites of the institutions, through an IPEDS request or through the NY Times developer portal. A Citrix server for use in the IBM SPSS Statistics program stored the data, which UND maintains and protects behind a username and password.

### Key Variables

The researcher identified key variables that might have impact on the two outcomes of interest. C2i captured and defined instructional mode with the following definitions (Marsciano et al., 2020):

- **In-Person:**
  - **Fully In-Person:** Classes exclusively conducted face-to-face
  - **Primarily In-Person, Some Courses Online:** Classes mainly conducted face-to-face with certain exceptions for online delivery
- **Online:**
  - **Primarily Online, Some Courses In-Person:** Classes taught primarily online with the exception of some courses such as allowing classes with lab components to meet face-to-face
  - **Fully Online, No Students on Campus:** Classes only conducted online, residence halls closed
  - **Fully Online, Some Students on Campus:** Classes only conducted online, residence halls open
- **Hybrid:**
  - **Some Variety of Methods, Non-Specific Plan:** Institutions provided a list of general intentions but did not have a clear plan or a clear distribution of classes available by mode of instruction.
  - **Professor's Choice:** The institution allowed their professors to pick their method of academic delivery.
  - **Simultaneous Teaching:** Professors required to teach their courses online and face-to-face, at the same time.

- **Other:**
  - A mode of instruction not listed among those above.
  - **TBD:** No announcement made about fall 2020 instruction.
  - **No COVID Mentions:** Some institutions, such as religiously aligned or special-mission institutions, did not have COVID-19 updates available on their websites.

Control was determined by IPEDS with the following definitions:

- Public institution - An educational institution who supports programs and activities primarily by public funds and operated by publicly elected or appointed school officials.
- Private not-for-profit institution - A private institution in which the individual(s) or agency in control receives no compensation, other than wages, rent, or other expenses for the assumption of risk. These include both independent not-for-profit schools and those affiliated with a religious organization.

The New York Times developer portal coronavirus (COVID-19) data provided reported COVID-19 case counts college and university campuses (New York Times, 2020). The data included cases reported at 1,900 American colleges, which included every four-year public institution and every private college that competes in the National Collegiate Athletic Association. It is important to note that in the absence of a national tracking system, institutions were free to set their own rules on how they counted and reported infections, but the Times's survey remains the most comprehensive account available to date. While it may not accurately represent the actual number of cases on a campus, it does represent the data used by campus administrators to make decision as the reported count of cases. Table 2 lists additional descriptions and levels for the variables.

**Table 2***Descriptions of variables*

<b>Variable Type</b>	<b>Variable Name</b>	<b>Variable Description</b>	<b>Levels or Range of Values</b>
Dependent Variables	Instructional Mode ( <i>RQ2 only</i> )	Type of instructional mode for fall 2020	1 = in-person 2 = online 3 = hybrid 4 = other
	COVID-19 Cases ( <i>RQ3 only</i> )	Case count for each institution	boundary of 0; infinite number of values
Independent Variables	Campus Setting	Geographic status of based on the institution's physical address.	1 = rural/town 2 = suburb/city
	Instructional Mode ( <i>RQ3 only</i> )	Type of instructional mode for fall 2020	1 = in-person 2 = online 3 = hybrid 4 = other
	Locus of Control	A classification of whether an institution operates by publicly elected/appointed officials and derives funding from public sources or operates by privately elected/appointed officials and derives its major source of funds from private sources.	1 = public 2 = private
	Institutional Size	Based on total students enrolled for credits	1 = under 5,000 2 = 5,000 and above

Research question one included a demographic review of institutional response. The literature revealed several types of institutional characteristics that were useful for this study's model for research questions two and three, including institutional size (based on full time equivalency or FTE) (Rasmussen & Johnson, 2008; Sherwood & McKelfresh, 2007), location (census region), campus setting (Akers, 2007; Sherwood & McKelfresh, 2007), and locus of control (public or private) (Covington, 2013; Catullo et al., 2009; Zdziarski, 2001).

For research question two, the independent variables in this study included the categorical variables of institutional size, the locus of control of the institution, and campus setting. The dependent variable was a categorical variable representing the type of instructional mode for each institution.



The independent variables in this study for research question three included the following categorical variables: institutional size, locus of control, campus setting, and the type of instruction mode for each institution. The dependent variable was the number of reported cases for each institution (count data) based on data obtained from the New York Times developer portal Coronavirus (COVID-19) data (New York Times, 2020). While this dataset may not accurately represent the actual number of cases on a campus, it would represent the data used by campus administrators to make decisions as the reported count of cases.

### **Data Analysis and Validity**

Two phases of research, the preliminary and main analysis phase, completed this study. After merging all the data sources into one Microsoft Excel document (IPEDS instructional characteristics, C2i instructional modes, and New York Times COVID-19 count data) and removing institutions with missing variables, the IBM SPSS Statistics software performed the analysis calculations.

The methodology called for a descriptive overview for research question one. For research question two, the methodology called for multinomial regression. Research question three called for a Poisson regression which performs within the conditions of equal mean and variance. However, due to the overdispersion in the sample as the variance exceeded the mean in the sample, the best fit model used a negative binomial regression.

### **Preliminary Analysis**

After combing the data into one dataset, calculations of the raw data, including the percentage of the whole sample presented an overview of the sample. If any single value was missing, listwise deletion excluded the entire record. Sample size guidelines for multinomial logistic regression indicate a minimum of 10 cases per independent variable (Schwab, 2002), so

it was essential to perform a review to ensure each variable had enough cases. By analyzing the simple descriptive statistics, the sample data presented a straightforward interpretation, described the limitations of the data, and identified potential relationships between the variables.

Table 3 provides the results of the Chi Square Tests of Independence between the variables. Control was independent of setting ( $\chi^2 = .652, p = .420$ ). Control was not independent of size ( $\chi^2 = 109.159, p < .001$ ). Setting was not independent of size ( $\chi^2 = 40.894, p < .001$ ). Instructional mode was not independent of control ( $\chi^2 = 23.740, p < .001$ ). Instructional mode was independent of setting ( $\chi^2 = 11.365, p = .010$ ). Instructional mode was not independent of size ( $\chi^2 = 19.582, p < .001$ ).

**Table 3**

*Chi square results for variables*

	$\chi^2$	df	Asymptotic Significance (2-sided)	Minimum expected count
Control * Setting	.652	1	.420	86.87
Control * Size	109.159	1	<.001	82.94
Setting * Size	40.894	1	<.001	68.92
Instructional Mode * Control	23.740	3	<.001	35.83
Instructional Mode * Setting	11.365	3	.010	29.77
Instructional Mode * Size	19.582	3	<.001	28.43
N of Valid Cases	434			

0 cells (0.0%) have expected count less than 5.

**Main Analysis**

***Research Question 1***

*What did preparedness ‘look’ like for COVID-19 in the fall of 2020 at four-year public and private institutions in the Midwest and Mountain regions of the United States?*

Research question one was a demographic overview of the institutional response, as defined with instructional mode at 4-year institutions in the Midwest and West (Mountain) region to set the stage for the varied responses of higher education during the COVID-19

pandemic in the fall of 2020. Descriptive statistics summarize the sample used for analysis and provides clarity with basic measurements of the data. Table 4 provides the results for the descriptive statistics of variables used within this study.

**Table 4**

*Descriptive statistics for fall 2020*

Variable Name	Levels or Range of Values	Frequency on 10/24/2020, 11/5/2020, and 11/19/2020	Percentage
Instructional Mode	1 = In-Person	151	34.8
	2 = Online	120	27.6
	3 = Hybrid	90	20.7
	4 = Other	73	16.8
Campus Setting	1 = Rural/Town	177	40.8
	2 = Suburb/City	257	59.2
Locus of Control	1 = Public, four-year or above	213	49.1
	2 = Private, not-for-profit, four-year or above	221	50.9
Institutional Size	1 = Under 5,000	265	61.1
	2 = 5,000 and above	169	38.9

### **Instructional Mode**

The C2i dataset provided the instructional mode variable and included institutions that taught in-person (including fully or primarily in-person), online (including fully or primarily online with residence halls open or closed), hybrid (which included a variety of methods such as simultaneously teaching and professors choice), and other (any method not included above) in the fall of 2020 (Marsicano et al., 2020). The descriptive statistics indicated that the largest proportion of institutions, 35%, chose in-person learning as their mode of instruction. Following close were 28% of institutions that were instructing primarily online. All institutions studied kept the same instructional mode throughout the timeframe set for this study.

### **Case Counts**

The dependent variable that represents the number of reported cases for each institution was based on data obtained from the New York Times developer portal Coronavirus (COVID-19) data (New York Times, 2020). While this dataset may not accurately represent the actual number of cases on a campus, it would represent the data used by campus administrators to make decisions as the reported count of cases. The average number of reported case counts at institutions in this sample on November 5, 2020 were 222.313 cases (not accounting for institutional size and different testing strategies at different institutions).

### **Institutional Characteristics**

The variables that made up the other institutional characteristics studied include campus setting, institutional locus of control, and institutional size. The majority of institutions (257) are in suburbs/cities, while 177 are in areas classified as rural/town. There was a near equal distribution of control between private, not-for-profit, and public institutions, with private institutions controlling 50.9% of the reporting institutions. Finally, most of the institutions in this sample enrolled less than 5,000 students (265 institutions).

### ***Research Question 2***

*How do institutional characteristics of institutions of higher education relate to the likelihood of a specific response of instructional mode during a public health crisis?*

For research question two, the independent variables in this study included the geographic campus setting of the institution (two categories), the size of the institution (two categories), and the locus of control of the institution (two categories). Using IPEDS size categories which are based on the total number of students enrolled for credit, institutional size categories were: 1.) Under 5,000 students or 2.) 5,000 and more students. The two categories of

institutional locus of control were based on IPEDS institutional type categories: 1.) public, 4-year or above or 2.) private not-for-profit, 4-year or above. The campus setting variable used IPEDS to classify as “suburb/city” or “rural/town”.

The dependent variable was a categorical variable representing the type of instructional mode for each institution. This variable consisted of four categories based on the College Crisis Initiative’s (or C2i) categorization (Marsicano et al., 2020). These categories included “in-person,” “online,” “hybrid,” and “other.” Since instructional mode was based on institutional choice and what administrators viewed as the most adequate reaction for their institution, this variable functioned as a proxy for institutional response for this study.

A multinomial logistic regression model which described the nature of difference between groups and considered intercorrelations between predictor variables (Hosmer et al., 2013) addressed research question two. After coding the nominal scale outcomes, a comparison of the interactions between the setting, control, and size of the institutions customized the model to understand the relationship between the variables in the model. The baseline category was in-person and with the other categories being based against this baseline, which corresponds to a generalized model of:

$$\log P(Y=j|\mathbf{x}_i)/P(Y=J|\mathbf{x}_i) = \alpha_j + \boldsymbol{\beta}_j \mathbf{x}_i, \quad j=1, \dots, J-1$$

where

$J$  = Number of categories

$\boldsymbol{\beta}$  = a vector of parameter estimates

$\mathbf{x}$  = a vector of independent variables

$i$  = subscript for institutions

$\alpha$  = Intercept - log-odds of choosing option  $j$  relative to option  $J$ .

The reported McFadden's *Pseudo R*<sup>2</sup> and likelihood ratio chi-square statistic demonstrate goodness of fit for the model.

To measure the constant effect of the predictor variables, reporting the odds ratio approximated the likelihood that one outcome would occur (Hosmer et al., 2013). If the odds ratio was greater than 1, the odds of that instructional mode happening in the presence of the specific independent variable was greater than the odds of the same outcome in the absence of that independent variable. Because an odd ratio of less than one indicates a lower odd of association, to ensure clear communication in the results, presenting the inverse indicates the event is less likely to occur.

Since multinomial logistic regression does not require assumptions on dependent or independent variables and assumes a non-perfect separation on independent variables (Schwab, 2002), it is important to use this test when analyzing relationships between multiple categories of institutional characteristics and instructional mode. This study used the advantage of the multinomial logistical regression test to study the relationship.

### ***Research Question 3***

*How was instructional mode related to the number of cases reported among university students and employees in all fields at four-year public and private institutions during a public health crisis?*

For research question three, the independent variables in this study included the campus setting of the institution (two categories), the size of the institution (two categories), the locus of control of the institution (two categories), and the instructional mode (four categories).

The number of reported COVID-19 cases for each institution (count data) from the New York Times developer portal Coronavirus (COVID-19) data represented the dependent variable.

This study selected the dates November 5 through November 19, as this was the time of the fall 2020 term when the most new cases were occurring in the selected geographical area. In the fall of 2020, the CDC recommended a 14-day quarantine if exposed to the virus, so a review of the instructional mode two weeks before the start of counting the cases ensured a shift in instructional mode did not occur. As noted, no institution in the sample reported a change to instructional mode throughout the study timeframe.

Due to the nature of the outcome variables (reported case counts per institution) modelling a Poisson regression was the initial step to answer this research question. The Poisson random variable is a count, and this regression allows the institutional characteristics such as instructional mode, size, locus of control, or campus setting to explain the variability of the main parameter ( $\lambda$ ), or the average number of COVID-19 cases (Cameron & Trivedi, 2013). The Poisson regression model parameter ( $\lambda$ ) determines both the mean and the variance, so an important assumption is that the mean and variance are approximately equal for each group of the independent variable (Roback & Legler, 2021). The loglinear form of the Poisson regression model takes the following general form:

$$\log \mu(\mathbf{x}) = \alpha + \beta \mathbf{x}_i$$

where

$\mu$  = the expected value for the Poisson case counts

$\beta$  = a vector of parameter estimates

$\mathbf{x}$  = a vector of regressors

$i$  = a subscript for institution

In the above model, the  $\mu$  satisfies the following exponential relationship:

$$\mu(\mathbf{x}) = \exp(\alpha + \beta \mathbf{x}_i)$$

Where the natural log transforms the multiplicative model into an additive one.

To measure goodness of fit and to ensure the model did not violate the assumption of equal mean and variance, the model checked for overdispersion, or in other words, was the variance significantly larger than the mean. Since the model found overdispersion, the study used a negative binomial model, which relaxes the assumption of equality between mean and variance.

### **Limitations**

One confounding variable in this study was the difference in the way campuses reported cases as there is no national tracking system that allows a campus-to-campus comparison. While the Times data remains the most comprehensive account available to date, it also clearly indicates the count is not complete. While the threat to validity is significant, it does not outweigh the value of asking research question 3 in the researcher's opinion.

Other higher educational databases are self-reported (such as IPEDS) but used in various research studies. This study did not seek to make institution to institution comparisons, which is not a recommended use of the Times data since colleges and government agencies reported data differently, cases may have spread across multiple campuses, and there are disparities across the size of campuses. This study also did not intend to use observational data to determine a cause and effect (such as the type of instructional mode leads to COVID-19 cases) but instead to show a relationship between instructional mode and COVID-19 cases. Due to the relatively recent nature of the COVID-19 pandemic, follow up studies, surveys, and qualitative studies will be useful in validating the study.

It is important to note that the data used for this study were primarily self-reported to the New York Times and IPEDS, and therefore may contain errors. The model used in this study did not contain variables for each explanatory variable that may have impacted decision making



during the COVID-19 pandemic at institutions of higher education. Many institutional characteristics that impacted campus decision making, including pressures from external stakeholders, the internal community, and the characteristics that make each institution unique could have played a part in why campuses chose to respond as they did.

### **Summary**

This study used a quantitative research design to review the nature of institutional response to the COVID-19 pandemic in the fall of 2020. After collecting the data from three primary sources of IPEDS, the New York Times, and the College Crisis Initiative and reviewing the sample of institutions of higher education selected geographic area, the model used a multinomial logistic regression and a negative binomial regression with estimated parameter dispersion model to answers the research questions.

## CHAPTER IV

### Results

This study observed the nature of Midwest 4-year private and public institutions of higher education response (measured using instructional mode) to the COVID-19 pandemic in the fall of 2020. By observing several characteristics of the institutions, the intent was to discover associations that may prove impactful for future decision-making concerning crisis management and disruptions to normal educational operations in higher education. This chapter provides the results of the research for each research question:

1. What did preparedness ‘look’ like for COVID-19 in the fall of 2020 at four-year public and private institutions in the Midwest and Mountain regions of the United States?
2. How did institutional characteristics of institutions of higher education relate to the likelihood of a specific response of instructional mode during a public health crisis?
3. How was instructional mode related to the number of cases reported among university students and employees in all fields at four-year public and private institutions during a public health crisis?

This chapter sets up the conditions of the research of the research that may have influenced the sample, provides an overview of the demographics and coding of the data, outlines the data analysis and validity of the study, and outlines the study results for each research question.

### Research Context

In fall 2020, institutions of higher education in the Midwest, like the rest of the country, began their semester with a sense of trepidation. By reviewing what the landscape looked like

during the time of the study, when the Midwest experienced an uptick in COVID case counts, this study strove to set the stage for informed decision-making during emergency responses. Dividing this chapter into sections based on the three research questions guiding this exploratory study, supports the research goal to supplement the current literature in crisis management for institutions of higher education and to understand the relationship between instructional mode outcomes based on institutional characteristics and case counts and institutional characteristics.

### **Observed Trends for Fall 2020**

To create the dataset for this study, the C2i data provided the list of institutions that reported their instructional mode for the fall 2020 semester, the IPEDS data identified the institutional characteristics in the sample, and the New York Times portal provided a reported COVID-19 case count for each institution in the sample. A review of the data presented the trends for the four-year institutions of higher education in the Midwest region in the fall of 2020.

Table 5 provides a breakdown of selected institutional characteristics by instructional mode for the sample. The east north central Midwest region had the most institutions (50.9%), followed by the west north central Midwest region (32.0%), and the Mountain region (17.1%) had the fewest. Institutions in this study instructed primarily in-person (129) for fall 2020, although public institutions were more likely to instruct primarily online. Table 5 also lists the institutional characteristics that were known to potentially impact campus decision making according to the literature. Finally, Table 5 includes several other notable characteristics not included as part of the model but do provide additional context for understanding types of the institutions included in the study. These characteristics included campus graduate programs, campus housing available, and the percentage of students aged 25 to 64 to total enrollment. In the sample, 344 institutions offer graduate programs, and most provide housing for students. For

115 institutions, the count of non-traditional students of 25-64 years old was empty in the IPEDS dataset; only 18 institutions reported more than 50% students who were 25-64 years old. Of the institutions chosen for the sample, none reported offering programs for which all required coursework for program completion would be available via distance education courses.

Considering most United States institutions of higher education switched to remote learning in the Spring of 2020, it is important for this study to note that these institutions switched from one mode to virtual in spring 2020 and went back to a different mode than as reported to IPEDS.

**Table 5**

*Selected characteristics by instructional mode*

	<b>In-person</b>	<b>Online</b>	<b>Hybrid</b>	<b>Other</b>	<b>Total</b>
<b>Control</b>					
Public	50	69	53	41	213
Private	101	51	37	32	221
<b>Campus Setting</b>					
Rural/Town	68	34	44	31	177
Suburb/City	83	86	46	42	257
<b>Size</b>					
Under 5,000	112	60	55	38	265
5,000 and above	39	60	31	35	169
<b>Location</b>					
West North Central	59	31	31	18	139
East North Central	69	67	46	39	221
Mountain	23	22	13	16	74
<b>Grand Total</b>	<b>151</b>	<b>120</b>	<b>90</b>	<b>73</b>	<b>434</b>
<b>Graduate Offering</b>					
Graduate degree or certificate	125	98	70	501	344
No graduate offering	26	22	20	22	90
<b>Provides housing</b>					
Yes	149	106	78	59	392
No	2	14	12	14	42
<b>Percent of students aged 25 – 60</b>					
Less than 50	146	116	87	67	416
50 or more	5	4	3	6	18

**Institutional characteristics of institutions related to a specific instructional mode**

To determine the association of institutional characteristics, including campus size, setting, and control, to the likelihood of a specific instructional mode, the researcher employed a multinomial logistic regression. Table 6 summarizes the results for the fit of the model.

**Table 6**

*Model fitting information for instructional mode*

Model	Model Fitting Criteria		Likelihood Ratio Tests	
	-2 Log Likelihood	Chi-Square ( $\chi^2$ )	Df	Sig.
Intercept only	139.711			
Final	99.149	40.562	9	<.001

*p* < .05, *n* = 434

The overall model showed statistical significance,  $\chi^2(9) = 40.562, p < .05$ , which indicated at least one of the regression coefficients was not equal to zero.

A McFadden’s pseudo-R-squared ranging from 0.2 to 0.4 indicates a good model fit. Table 7 outlines the Pseudo R-Square for the Instructional Mode with values for Cox and Snell (.089), Nagelkerke (.096) and MaFadden (.035).

**Table 7**

*Pseudo R-square for instructional mode*

Cox and Snell	.089
Nagelkerke	.096
McFadden	.035

*p* < .05, *n* = 434

Table 8 shows the two of the three independent variables, control ( $\chi^2 = 12.388, p = .006$ ) and setting ( $\chi^2 = 8.270, p = .041$ ), had a significant overall effect on the instruction mode outcome. It is important to note that the effects in Table 8 estimate the overall improvement of the model as a whole; they do not estimate or specify individual effects of variables for comparisons.

**Table 8***Likelihood ratio tests for instructional mode*

Effect	Model Fitting Criteria		Likelihood Ratio Tests		
	-2 Log Likelihood	Chi-Square	df	Sig.	
Control	111.537	12.388	3	.006	
Setting	107.419	8.270	3	.041	
Size	103.282	4.133	3	.247	

 $p < .05, n = 434$ 

Finally, the study evaluated the parameter estimates for the model. Table 9 shows the predictive model for each of the dependent variable categories online, hybrid, and other versus the "in-person" reference category. Comparing instructional mode in-person versus online, it shows that the statistically significant independent variables are control ( $\beta = .823, p = .006$ ) and setting ( $\beta = -.648, p = .023$ ). Comparing the in-person versus hybrid modes of instructions, control ( $\beta = .928, p = .002$ ) remains a statistically significant independent variable in effecting the model. While the instructional mode, "other", had no statistically significant effects, considering the other category tells little about the decision of the institution, the outcomes for this dependent variable category were not important for this study.

**Table 9**

*Parameter estimates for instructional mode*

Instructional Mode		Coefficient (β)	Std. Error	Wald	df	Sig.	Exp(β)	95% Confidence Interval for Exp(β)	
								Lower Bound	Upper Bound
Online	Control	.823	.302	7.428	1	.006	2.278	1.260	4.119
	Setting	-.648	.285	5.175	1	.023	.523	.299	.914
	Size	-.453	.321	1.989	1	.158	.636	.339	1.193
Hybrid	Control	.982	.319	9.461	1	.002	2.671	1.428	4.996
	Setting	.134	.294	.207	1	.649	1.143	.642	2.035
	Size	-.161	.350	.211	1	.646	.851	.428	1.692
Other	Control	.631	.345	3.347	1	.067	1.880	.956	3.696
	Setting	.055	.317	.030	1	.862	1.057	.568	1.966
	Size	-.672	.370	3.300	1	.069	.511	.247	1.054

The reference category is: In-person

$p < .05, n = 434$

Multicollinearity between (or among) independent variables weakens the overall prediction model (Field, 2013). The model used in this study showed multicollinearity in nearly all the independent variables (see Table 3). Control is independent of setting ( $X^2 = .652, p = .420$ ). Control is not independent of size ( $X^2 = 109.159, p < .001$ ). Setting is not independent of size ( $X^2 = 40.894, p < .001$ ).

**Relationship Between Case Counts and Institutional Characteristics**

Using a Poisson regression, the researcher tested the model using four independent variables to describe institutional characteristics: instructional mode for instructional mode for fall 2020, campus setting, locus of control, and campus size to the number of COVID cases recorded for the location of the institutions in the sample in fall 2020. The overall model found statistical significance,  $\chi^2(4) = 1088803.007, p = .000$  which indicates that all independent variables collectively improve the model over the intercept-only model. To determine which

regression method would be suitable for this dataset, consideration of the deviance statistics reported in Table 10 found the value/df nearest to one and the lowest AIC and BIC indicate the preferred method was the adjusted negative binomial regression.

**Table 10**

*Goodness of criteria for reported COVID-19 case counts regressions*

Model	Value/df	Deviance	Akaike's Information Criterion (AIC)	Bayesian Information Criterion (BIC)
Poisson regression	301.444	129319.324	131752.816	131773.182
Negative Binomial Regression	1.860	797.780	4990.641	5011.006
Negative Binomial with dispersion factor	1.228	525.789	4932.677	4957.115

The Poisson regression found significance associations between the number of reported COVID-19 cases at institutions of higher education and instructional mode offered in the fall of 2020, the campus setting, the campus control, and the campus size, as seen in Table 11. As the institutional size increases, the predicted log count of COVID-19 cases increased by 2.003 ( $\beta = 2.003, p = .000$ ) in the log counts of the COVID-19 cases. The incident rate ratio for every unit change in institutional size is 7.410 higher for those at the larger institutions. Differences in the instructional mode decrease COVID-19 cases ( $\beta = -.264, p = .000$ ), with an incident rate ratio for instructional indicating institutions were 23.7% less likely to increase the COVID-19 case count comparing in-person to online. Campus setting indicated a statistically significant increase from rural/town to suburb/city ( $\beta = .483, p = .000$ ) with an incident rate ratio increasing the number of COVID-19 cases to 59.5%. Finally, campus control relates to a decrease in COVID-19 cases between public and private institutions ( $\beta = -.528, p = .000$ ), or private institutions were 42% less likely to increase cases.



**Table 11**

*Poisson regression coefficients - COVID-19 case counts*

	Coefficient (β)	Std. Error	95% Wald Confidence Interval		Hypothesis Test			Exp(β)	95% Wald Confidence Interval for Exp(β)	
			Lower	Upper	Wald Chi- Square	df	Sig.		Lower	Upper
Size	2.003	.0111	1.981	2.025	32617.845	1	.000	7.410	7.251	7.573
Instructional Mode	-.264	.0033	-.271	-.258	6550.851	1	.000	.768	.763	.773
Setting	.483	.0086	.467	.500	3169.896	1	.000	1.622	1.595	1.649
Control	-.528	.0090	-.545	-.510	3404.171	1	.000	.590	.580	.601

Dependent Variable: Case Count

$p < .05, n = 434$

A Poisson regression assumes equidispersion, or the mean is equal to the variance. When this assumption fails, the presence of overdispersion may cause skewed results with incorrect estimated population parameters. If there is a lack of overdispersion, a negative binomial model will produce the same results. In this study, the deviance of the goodness-of-fit indicated the distribution of the reported COVID-19 case counts differed from a Poisson distribution. As a result, the study used a negative binomial regression to account for the overdispersion, and Table 12 outlines the results. This model revealed that an increase in unit of size (larger institutions) leads to an increase of 2.365 units in the log counts of the COVID-19 cases ( $\beta = 2.365, p = .000$ ). The incident rate ratio for every unit change in institutional size is 10.642 higher for those at larger institutions. Differences in the instructional mode decrease COVID-19 cases ( $\beta = -.262, p < .000$ ), with an incident rate ratio for instructional indicating institutions were 77% less likely to increase the COVID-19 case count comparing in-person to online. Campus setting indicated a statistically significant increase from rural/town to suburb/city ( $\beta = .280, p = .010$ ) with an

incident rate ratio increasing the number of COVID-19 cases 32.2%. Finally, campus control was not a significant predictor ( $\beta = .064, p = .628$ ).

**Table 12**

*Negative binomial regression coefficients for COVID-19 case counts*

	Coefficient ( $\beta$ )	Std. Error	95% Wald Confidence Interval		Hypothesis Test			Exp( $\beta$ )	95% Wald Confidence Interval for Exp( $\beta$ )	
			Lower	Upper	Wald Chi- Square	df	Sig.		Lower	Upper
Size	2.365	.1439	2.083	2.647	270.240	1	.000	10.642	8.027	14.108
Instructional Mode	-.262	.0451	-.350	-.173	33.751	1	<.001	.770	.705	.841
Setting	.280	.1080	.068	.491	6.701	1	.010	1.322	1.070	1.634
Control	.064	.1317	-.194	.322	.235	1	.628	1.066	.823	1.380

(Negative binomial)

Dependent Variable: Case Count

$p < .05, n = 434$

The SPSS Statistics can also estimate the dispersion factor for a negative binomial regression, which proved to be the best fit for this dataset. Table 13 lists the results for the negative binomial regression using an estimated dispersion parameter. This model revealed three significant predictors of size, instructional mode and setting. An increase in unit of size (larger institutions) leads to an increase of 2.367 units in the log counts of the COVID-19 cases ( $\beta = 2.367, p = .000$ ). The incident rate ratio for every unit change in institutional size is 10.667 higher for those at larger institutions. Differences in the instructional mode decrease COVID-19 cases ( $\beta = -.262, p < .000$ ), with an incident rate ratio for the instructional mode indicating institutions were 77% less likely to increase the COVID-19 case count comparing in-person to online. Campus setting showed a statistically significant increase from rural/town to suburb/city

( $\beta = .279, p = .039$ ) with an incident rate ratio increasing the number of COVID-19 cases 32.2%.

Finally, campus control was not a significant predictor ( $\beta = .067, p = .684$ ).

**Table 13**

*Negative binomial regression with estimated parameter dispersion coefficients for COVID-19 case counts*

	Coefficient ( $\beta$ )	Std. Error	95% Wald Confidence Interval		Hypothesis Test			95% Wald Confidence Interval for Exp( $\beta$ )		
			Lower	Upper	Wald Chi- Square	df	Sig.	Exp( $\beta$ )	Lower	Upper
Size	2.367	.1804	2.014	2.721	172.235	1	.000	10.667	7.490	15.190
Instructional Mode	-.262	.0564	-.372	-.151	21.523	1	<.001	.770	.689	.860
Setting	.279	.1353	.014	.544	4.255	1	.039	1.322	1.014	1.723
Control	.067	.1649	-.256	.390	.166	1	.684	1.069	.774	1.478
(Negative binomial)	1.578	.0981	1.397	1.783						

Dependent Variable: Case Count

$p < .05, n = 434$

**Summary**

After describing the demographic statistics to observe the dataset, research question two presented a multinomial regression model to answer the question. Since the Poisson regression indicated overdispersion, two additional negative binomial regressions found the best fit for the model for research question three. The 434 institutions that had complete data fit into the study to test the relationship between the characteristics and instructional mode in the fall 2020 and determine the predictability of the number of COVID-19 cases at institutions.

## CHAPTER V

### **Discussion, Limitations, and Recommendations**

As the COVID-19 pandemic continued to create challenges, by spring 2022, colleges and universities were moving from a containment approach to a maintenance approach, although remaining responsive and flexible when making decisions by having short periods of remote learning and adding mask mandates when the infection rates are high (Saul & Hartocollis, 2022). As institutions move into the new phase of maintaining the new normal, reviewing the past crisis management decisions will provide context for the future as well as shed light on the effectiveness of the changes in the instructional modes vis-à-vis public health concerns.

In fall of 2020, with the COVID-19 global pandemic quickly and drastically shifting higher education, institutional responses of different instructional modes may have lasting impacts. While in the past, the American higher education system centered on bringing students together to live and study in close proximity to each other in traditional four-year residential settings (Govindarajan & Srivastava, 2020; Korn et al., 2020), institutions had to quickly determine what would fit their campus best in the moment but now face determining which measures shall be permanent.

The purpose of this exploratory study was to study relationships between characteristics of institutions of higher education that may be helpful for future campus decisions during campus crises and to start to fill the gaps in the literature on crisis that fit in the unintentional, human, campus emergency crises. The results from this study provide insight on relationships and associations between institutional characteristics and institutional response in the midst of a pandemic. Literature presented on this topic provided patterns indicating that size, location, setting, and control impacted campus decisions during crises, and the study helped determine if

that was still the case during a pandemic crisis for one term. Considering the pandemic is still ongoing as this study concludes, this dissertation is one of a few studies focusing on COVID-19 and institutions of higher education.

The sample used in this study focused on public and private institutions in the Midwest and Mountain regions of the United States offering four or more years of study during the fall 2020. The sample consisted of data from the College Crisis Initiative, or C2i (Marsicano et al., 2020), data obtained from the New York Times developer portal Coronavirus (COVID-19), and the integrated post-secondary education data system, or IPEDS. The study sample removed any record with missing variable information, including instructional mode or reported COVID-19 case count data. The methods used for this study included a multinomial logistic regression to test the relationship between instructional mode and institutional size, setting, and control and a negative binomial regression with an estimated parameter dispersion coefficient to test the relationship between case counts and instructional mode, institution size, setting and control.

The following sections offer interpretations and discussions of the findings. As an exploratory study and to continue the work to help institutions understand the complexity of decision-making during a campus crisis, this chapter includes additional recommendations for future research.

### **Interpretation of Findings**

This study focused on three primary research questions focusing on the landscape of institutions in the fall of 2020, relationships between institutional characteristics and the impact on instructional mode, and the relationship of institutional characteristics, including instructional mode, and COVID-19 case counts.

**Research Question 1**

*What did preparedness 'look' like for COVID-19 in the fall of 2020 at four-year public and private institutions in the Midwest and Mountain regions of the United States?*

This study provided an overview of the institutions in the Midwest and Mountain regions of the United States during fall 2020. Most institutions were instructing primarily in-person and had an average COVID-19 count of 222 cases. It is important to remember that institutions did not shift instructional mode during the timeframe of this study, and while the New York Times dataset is the most comprehensive count data available for American colleges and universities, there are limitations for its use, especially if comparing an institution to an institution since this dataset may not accurately represent the actual number of cases on a campus. However, it does represent the data used by campus administrators to plan during a campus crisis as it is the reported count of cases.

Higher education institutions evolved in the fall of 2020 as the pandemic continued to pose uncertainties, particularly as they challenged assumptions from spring 2020 (Gardner, 2020). The pandemic proved to not be as short-term as originally hoped, and the crisis for most campuses continued through the full academic year, if not beyond. The rapid transition to virtual/distance learning in the spring of 2020 did not allow for much of a planning period, but the fall provided some additional time for institutions to consider all the options that may be best for their institution.

When considering the start of the fall 2020 term in August for the institutions in this study, it is important to note that the majority were primarily in-person. Considering new COVID-19 case counts were not rising at this time in the area studied, most institutions provided graduate studies, housing for students, and had less than 50 percent of their student body over the

age of 25, the institutions were fairly traditional. The region with the largest institutions (19 with 20,000 or more students) also had the largest number of institutions either fully or primarily online. Within that region, 38 institutions had an instructional mode status of TBD during the time frame for the study, indicating a lack of decision or a lack of communication about the decision, both of which are not ideal for a crisis response (Catullo, 2008; Lott, 2012; Zdziarski, 2001).

The fact that private institutions rate their level of preparedness for crisis higher than public institutions (Catullo et al., 2009; Covington, 2013; Zdziarski, 2001) may explain why nearly half of the private institutions were moving forward with some form of in-person instruction while only 23 percent of the public institutions were doing the same. Larger institutions may have reviewed their plans (Rasmussen & Johnson, 2008), but due to the campus population, more than 35 percent were primarily instructing online in the fall of 2020.

For past campus crises, campus settings, such as large metropolitan areas, did impact their emergency preparedness (Akers, 2007). For this study, institutions in the city/suburb areas split between primarily instructing online and in-person. While this may be due to preparedness for emergencies, other variables may also impact the ability of a campus to be in-person, such as local community guidance, ordinances and resources. The landscape for institutions in this study's population did not change throughout the study timeframe, despite the notable spike in COVID-19 cases.

## **Research Question 2**

*How do institutional characteristics of institutions of higher education relate to the likelihood of a specific response of instructional mode during a public health crisis?*

Statistical findings of this study revealed that private institutions were 2.278, or 127.8%, more likely to choose online over in-person instruction. Rural campuses were 47.2% less likely to choose online instruction. Campus size did not have statistically significant results for this sample.

Little empirical research is currently available to explain the effects of these institutional characteristics on the changes of the instructional mode or other crisis management plans in response to the coronavirus pandemic. However, the ongoing national discourse among educational leaders in, for example, rural higher education confirms that rural colleges and universities were not always ready to move their institutions fully online due to the several reasons, including a digital divide and a poor broadband internet infrastructure in the communities, risk of a lower enrollment limiting class offerings, and a need for connectivity and care for students (Ratledge et al., 2020). While community colleges are not part of this study, the observed and documented struggle and challenges among rural community colleges to transition to remote offerings during the pandemic is noteworthy, as noted by the Council of American Education (Summers, 2020). Rural four-year institutions may share similar ecosystems of limited social and technological infrastructure and access opportunity. The attention to the issues and needs of college students and their access to a contemporary opportunity structure that supports flexible and remote learning remains to occupy public policy domain, as evident in state and federal legislatures (U.S. Department of Education, 2022) including the introduced federal bill of *Supporting Connectivity for Higher Education Students in Need Act* (2020).

An institutional characteristic, such as private or public control, is a complex variable that is challenging to interpret, especially for the public ones, without considering the sociopolitical make-up of the states and a historical trend of an inherent conflict between an institutional



autonomy and state control in policy domain (McLendon, 2003; McLendon et al., 2009).

McLendon (2003) observed that higher education institutional policies or agenda setting do depend on “the right political conditions” (p. 505). The global pandemic has proved to cause a high degree of politization and polarization along the party lines (Hart et al., 2020).

Not surprising is that the emerging research, that considers external factors, indicates that state politics does impact both private and public institutions instructional mode (Collier et al., 2020; Felson & Adamczyk, 2021). Considering most states falling within this study’s sample population had Republican governors (all but four) and Republican-controlled legislatures (all but five, including a nonpartisan, unicameral house and one split control of chambers), it is not surprising that most institutions chose in-person instruction in fall 2020. In addition, demographics of the student body may have played a large role in the campus decisions (Collier et al., 2020; Whatley & Castiello-Gutiérrez, 2021).

### **Research Question 3**

*How is instructional mode related to the number of cases reported among university students and employees in all fields at four-year public and private institutions during a public health crisis?*

Findings for research question three indicate that larger institutions led to more COVID-19 cases, instructional mode changes from in-person to online or hybrid decreased the COVID-19 case counts, and campuses located in suburb/city were more likely to have a higher case count than rural/town campuses.

Higher education crisis management literature indicates that campus size impacts campus preparedness (Akers, 2007; Sherwood & McKelfresh, 2007). For this study, larger institutions and those located in cities have more people and less space so COVID-19 exposure may have

been greater and harder to control, even if they may have been more prepared to handle the crisis. Considering Anderson et al.'s (2022) findings that colleges opening with in-person instruction increased local COVID-19 cases, this study supports that online instruction reduces the case counts on the college campus.

As academic communities began to see the impacts COVID-19 had, and continues to create, it opens a door for innovative opportunities as institutions create a sense-making platform to justify changes and institutional mandates (Reimers & Schleicher, 2020). While the change from the in-person to online and hybrid instructional mode is associated with the decrease of the COVID-19 cases in the communities (Anderson et al., 2022), whether universities and colleges bear responsibility and are accountable to the public perceptions about universities' liability during a community disaster response has been an ongoing talking point in many institutional addresses (by the presidents, provosts, and other academic leaders). Leaders have framed speeches about institutional mandates and instructional changes with the notions of a right thing to do to keep communities safe or safer. However, little empirical evidence existed to suggest whether these institutional crisis management plans and engagement of universities in community disaster response were indeed effective (Dunlop et al., 2014). The findings in this current study contribute to this ongoing discourse and scarce research to suggest that the change in the instructional model had an association with the decreased number of infections.

### **Limitations of the Study**

While the results for specific factors were significant, these results only apply to the study's location and population. As noted earlier, one confounding variable in this study is the difference in the way campuses reported COVID-19 cases with no national tracking system that allows a true campus to campus comparison. The New York Times's survey remains the most

comprehensive account available to date, but it may not accurately represent the actual number of cases on a campus. It does represent the data used by campus administrators to make decisions as the reported count of cases. The New York Times data does not recommend institution to institution comparisons, which this study does not do.

The collection of the data sets primarily relied on campuses to self-report not only case counts but also instructional modes. Despite the fast-changing nature of the pandemic, the assumption is that institutions were following the noted instructional mode. However, some institutions may have switched instructional modes (whether across campus or allowed changes class by class), but not communicated those changes to the broad public.

While the quality of the data presents a threat to validity, utilizing these datasets offers a start to the exploratory analysis to determine factors that impact the number of cases affecting institutions. Rather than using the observational data to determine a cause and effect between the instructional mode and COVID-19 case counts, the study explained relationships between the variables to inform practice for the future.

Due to the relatively recent nature of the COVID-19 pandemic, follow up studies, surveys, and qualitative studies will be useful in validating the study. As the COVID-19 pandemic continues to evolve, additional studies will assist with the theoretical framework for crisis decision making during pandemics, the long-term effects of decisions during a pandemic, and shift the institutions into a new normal.

### **Implications and Recommendations for Theory and Research**

The current scope of theory and research for higher education campus crises is small with studies primarily focused on short or one-time events. Most studies, articles, books, and reflections on campus crises come from campus administrators and students directly impacted by

violence or weather-related crises affecting only their campus community. The worldwide COVID-19 pandemic affected students, faculty and staff, families, college campuses, communities, states, and countries. There are many factors that institutions must consider when making decisions amid a pandemic. Politics, athletic conferences, college population, Carnegie classification, and peer institution decisions are all part of the complex world in which administrators are attempting to make decisions.

Additional variables related to the role of parents may need additional attention, due to the possible pressure that parents may exert on colleges and universities. Media reports of parental expectations revealed division on whether COVID-19 guidelines were necessary during the fall 2020 semester, with some parents calling for a return to a "normal college experience" (Beger & Charania, 2021, par. 2) for fall 2020. Recent research about parents' support for COVID-19 risk mitigation plans (Chua et al., 2021) in K-12 schools indicates that the split was almost half, with the families of Black or Asian race/ethnicity and families with children with health conditions less likely to support in-person learning. Other key institutional actors are faculty, whose role and influence in reopening plans remains underexamined. Anecdotal data through media reports (Knight, 2020) show that faculty were vocal against in-person instruction plans in some institutions, thus, whether that influence had any impact on choosing one mode of instruction and other means of mitigations over the others will be important to add to future research projects.

While crime and violence are prevalent in schools and higher learning communities (Chekwa et al., 2013), campuses offer little guidance on handling unintentional, human crises (CDC, 2020b; Gigliotti, 2016; Moerschell & Novak, 2020). Public health crises such as pandemics have a recognized research gap (Thomas et al., 2007; Thomas & Young, 2011) which

opens the door for the COVID-19 pandemic to provide valuable research for higher education. This study's finding about the potential associations of instructional mode with institutional characteristics and how they might mitigate a human unintentional crisis leads to a recommendation that campus crisis plans that relate to campus' characteristics may help reduce the impact on the campus and local community. Additional studies into different sections of the Crisis Matrix presented by Zdziarski et al. (2007) are necessary for campuses to have better preparedness. In addition, studies on long-term crisis planning and preparation may also be helpful for campus leaders.

Future research on the COVID-19 pandemic can help form better campus crisis management plans, train teams and administrators to mitigate situations, and ensure a proper communication plan is in place for the campus community. Today's higher education landscape indicates a need for colleges to remain caring and responsive (Rollo & Zdziarski, 2007). Finding long-term crises framework and responses in current research is difficult, but as the COVID-19 pandemic demonstrated, campuses may need to develop a long-term crisis response plan to handle similar crises.

The current literature indicates that planning for a crisis in the middle of an event is not ideal (Zdziarski et al., 2007). During the COVID-19 pandemic, institutions made decisions about fall 2020 during spring and summer of 2020 (when the pandemic was still happening) and had to make decisions about spring 2021 during the fall 2020 semester (as the pandemic was spiking in the study's area). Siegel (1994) captured stories of campus tragedies and noted "in most schools leaders commented that following the events described in this book people would not be the same for the rest of the year (p.254)." As campuses enter the recovery phase of the crisis management cycle, it will be critical to consider the social, physical, and mental toll of the

COVID-19 pandemic. Studies on the impact of making decisions while under the stress may also clarify campus response during this specific pandemic.

### **Implications and Recommendations for Practice**

This study provides a start for institutions to consider their characteristics as they make decisions around future pandemics. The current CDC guidelines provide resources to slow the spread and prevent the transmission of the COVID-19 variants among students, faculty and staff (CDC, 2022). Current key points include indoor masking, isolation times, screening strategies, and promoting vaccine trust and confidence. The guidelines suggest using the level of community transmission and the strain on the health system capacity within the community as a primary factor in determining prevention strategies, however, the prevention strategies do not include a review of instructional mode (CDC, 2022). This study suggests that adding a review of instructional mode as part of prevention strategies may impact the spread of COVID-19 on institutions. In addition to the considering the community transmission, accessibility of testing, and the health capacity system within the local community as suggested by the CDC (2022), institutions may also want to consider their size and location as a prevention strategy for COVID-19. Combining the additional research that is underway, this study contributes to the work so campus leaders can make the best decision for their institution in the event of an unintentional, human crisis.

The American Rescue Plan provided around \$40 billion to colleges and universities (US Department of Education, 2022), and institutions primarily used the funding for testing, health screenings, and other urgent health needs (Taylor & Melidona, 2021). However, this funding also allowed institutions to keep students enrolled, faculty and staff employed, and alleviate the digital divide to provide virtual instruction (Taylor & Melidona, 2021). As institutions navigate

crisis and maintain their connection to an overall mission of education, planning to use resources to support the findings of this study, such as supporting online or hybrid instruction at large institutions in suburban/city settings may significantly impact the local impact of the crisis. By planning for situations where remote learning may be necessary, institutions can reduce the learning disruptions that may happen on campus.

At the start of COVID-19, professors and students had to shift quickly to online or remote teaching and learning methods, often without the resources or intentional planning to deliver an inclusive study plan (Aguilera-Hermida et al., 2021; Hodges et al., 2020). Hodges et al. (2020) describe this as Emergency Remote Teaching (ERT) and provide a distinction between ERT and traditional online education. During a crisis, ERT provides temporary access to instruction rather than a robust learning environment. As a result of the ERT response to COVID-19, many faculty members were unfamiliar with online conferencing software, lacked adequate hardware such as web cameras and high-quality microphones, and had little to no training in online course delivery (Coyne et al., 2020). While technology is not as critical to effective online education as the practices and initiatives of the faculty and institutions (Wang et al., 2013), special considerations for practice should focus on the support of faculty if campus response plans include shifting instructional modes.

As challenges exist, there may be assumptions that pedagogies do not suffer when traditionally in-person classes suddenly move online, campus crisis planning should address the readiness of faculty to provide flexible instructional modes. To illustrate, Coyne et al. (2020) recommend faculty address a crisis response by preparing for diverse modes of instructions and flexibility due to unexpected and abrupt interruptions to prioritize which courses should move online. Norris and Lefrere (2011) proposed the role of the faculty must change as institutions

unbundle and re-invent teaching, learning, and assessment to create sustainable models for online learning. Incentives for course developments and [re]designs to be better prepared for the future would be helpful as faculty work with campus leadership to plan for a campus crisis (Garcia-Morales et al., 2021). In addition, preparing faculty members to overcome the barriers identified with online teaching that emerged during the COVID-19 pandemic will be an important part of crisis management, from providing the tools to ensure an appropriate physical environment for online teaching to faculty development on hybrid environments to ensure students in both settings receive high-quality instruction (Dwivedi et al., 2020).

As institutions consider which instructional mode to choose when faced with an ongoing global pandemic that impacts not only the campus community but the surrounding community, public and private institutions may have different pressures to consider. For this study, the instructional mode chosen does impact the COVID-19 case count. Public institutions may consider their setting and size and instructional mode chosen when weighing against the possible outcomes for their local community to stop the spread of a disease.

### **Summary**

Every crisis allows for an opportunity to learn from the successes and failures. The final stage of the crisis management cycle is learning (Zdziarski et al., 2007), which allows institutions to learn from mistakes, identify strengths of individuals and campus communities, and acquire skills to respond to the next crisis. In review of the 1918 flu pandemic, the University of North Dakota noted:

Together with some other institutions and many communities, we erred thru ignorance, not knowing in advance how the epidemic might operate, and not realizing the seriousness of the situation. It came upon us in a rush and caught us unprepared: hospital



facilities were not adequate, a sufficient number of nurses were not obtainable when the need came, and too few physicians were employed. Likewise, in all probability, we erred thru our excessive desires to cooperate with the military. The result was inevitable – unfortunate congestion in the wards, lack of proper nursing, inadequate medical attention. As compared with other similar institutions we probably had too many cases of influenza, too many cases of pneumonia, and too many deaths... (University Notes, 1919, p. 190)

It is by studying the past, institutions can better prepare for the future.

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