CALIFORNIA BAPTIST UNIVERSITY

Riverside, California

Local Risk Management Process and Influence on Community Risk Perception During the COVID-19 Shelter-at-Home Orders: Multiple-Case Study of the South Texas Counties of Cameron, Hidalgo, and Nueces

A Dissertation Submitted in Partial Fulfillment of the
Requirements for the degree
Doctor of Public Administration

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March 2023

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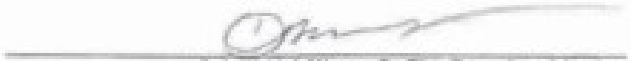

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ABSTRACT

This study examined local public health organizations' (LPHOs) risk management processes in the three South Texas counties of Cameron, Hidalgo, and Nueces during the COVID-19 pandemic local Shelter-at-Home orders. The research primarily focused on each LPHOs' risk management processes during the COVID-19 Shelter-at-Home orders to ensure effective collaborative governance between local governments and their agencies and risk communication activities on the Facebook social media platform. The risk management process discussed in this study included these two guiding principles: collaborative governance and risk communication. In addition, this study refers to the LPHOs' risk management process as the public health emergency management network (PHEMnet). PHEMnet focuses on the emergency management activities of the LPHOs, from issuing orders to communicating them to the public using Facebook. The risk perception theory was used to assess the influence of the risk communication messages published on Facebook to the public during the shelter-at-home orders and amendments. This study employed a multiple-case study using a mixed methods approach to gather data and research findings. The content analysis focused on the local Shelter-at-Home orders and amendments issued. The sentiment analysis assessed the LPHOs' Facebook posts and community comments to determine their overall sentiments about the local mandates and community risk perception. In addition, the types of unified command approaches were identified through the content analysis of the orders and LPHOs' Facebook activity during this period. This research found a correlation between the sentiments expressed on Facebook and the type of unified command approach used by each jurisdiction. The research concludes that the jurisdictions that had established

stronger PHEMnets had lower sentiment polarity values among the public, demonstrating the community's trust toward their LPHO and overall acceptance of the Shelter-at-Home order. However, weaker PHEMnets had the highest sentiment polarity values among the community, further demonstrating the importance of fostering an effective PHEMnet with necessary public health stakeholders to build a positive and active community presence to have an effective risk management process for current and future emergencies.

Keywords: risk perception theory, COVID-19 pandemic, collaborative governance, risk communication, local public health organizations, unified command, emergency management, public health emergency management network

ACKNOWLEDGMENTS

"For I know the plans I have for you declares the Lord, plans to prosper you and not to harm you, plans to give you hope and future" (*King James Bible*, 1769/2017, Jeremiah 29:11). I have depended on this scripture for perseverance throughout the years and will ensure that all my works are done unto Him to benefit his children and the heavenly kingdom. Therefore, first and foremost, I want to acknowledge my Heavenly Father who has never left my side through the good and bad times of my life whether I was aware of His presence or not. I declare that I will forever commit myself and work unto You throughout my lifetime.

To my committee chair, Dr. Mark Moland, thank you for your support, guidance, and encouragement during my dissertation. Your advice was essential in making this dissertation possible and always added incredible value to my study during moments of uncertainty. Your constant encouragement helped me achieve this accomplishment, and I couldn't have had a better dissertation chair. Also, to my cohort member who started with me, Dr. Ana Kukowksi, thank you for always allowing me to vent and laugh with you during this time. You were the only person I could truly relate with on this D.P.A journey because you knew exactly what I was going through. I am proud to say that I have made a lifelong friend with you, and I can't wait to see what the future holds for you!

This life experience was significantly made possible by my husband, Christopher Justin Rabe. Chris, you have helped me develop into who I am today. Thank you for your continued support and understanding during this chapter of our lives. I am so grateful to have you as my husband. No one compares to you and never will! Your love and support of me remind me of "husbands, love your wives, as Christ loved the church and gave

himself up for her" (*King James Bible*, 1769/2017, Ephesians 5:25). We have built such a beautiful life together on our own, and from now it will be that much easier and greater as this chapter ends for all of us—me, you, Conrad, and Gunnar. I love you!

The decision to move forward with this doctoral journey was also based on my children, Conrad Nathan and Gunnar David Rabe. To my children, you were named after strong biblical individuals; therefore, always remember, "We know that in all things God works for the good of those who love Him, who have been called to His purpose" (*King James Bible*, 1769/2017, Romans 8:28). Conrad, my eldest son, thank you for always believing in me and always being proud of me every time I would complete a section or chapter for this dissertation. Your constant encouragement motivated me to continue this journey and demonstrate that life is what you make it. Do not let anyone discourage you from ever pursuing your dreams because of their negativity. Gunnar, my youngest son, you were born during this journey and have been a beautiful and constant blessing in this family throughout this period. Your simple presence has been the joy that always was the cure I needed during the most stressful times in this journey. You have not only made this experience much more exciting but also made it much more worth it! For my children, through this experience, I want you to learn that hard work and perseverance consistently working toward the will of God are essential life components needed to become the person you were uniquely created to be.

To my mother, Delma Ozuna, I sincerely thank you for encouraging me to always be my best throughout my life and this academic journey. In every significant life experience, I know you will be there next to me—laughing or crying along with me. The unfortunate losses we have experienced have fortified our relationship, and I will always

be here for you as you have been for me. I love you mom, and I would like to leave you with this: “The Lord is my rock and my fortress and my deliverer, my God, my rock, in whom I take refuge, my shield and the horn of my salvation, my stronghold” (*King James Bible*, 1769/2017, Psalm 18:2). To my one and only little sister, Jhenna Marie Ozuna, I hope my experience has shown you that it is possible to manifest your destiny. Life is full of choices, and leaning on the Lord in every significant decision to move forward in your journey is essential. Therefore, “Trust in the Lord with all your heart, and lean not on your understanding; in all your ways acknowledge Him, and He shall direct your paths” (*King James Bible*, 1769/2017, Proverbs 3:5–6).

I would also like to sincerely thank and recognize my professional colleagues at Texas Department of Housing and Community Affairs, Rudy Bentancourt, Erica Garza, and Katie Wilkison. Your encouragement, guidance, and collaborative spirit have been invaluable in helping me navigate through this challenging and rewarding experience. I am truly grateful for your unwavering support and consider myself truly blessed to be working with such amazing people. This professional experience has proven that “the Lord leads with unfailing love and faithfulness to all who keep his covenant and obey his demands” (*King James Bible*, 1769/2017, Psalm 25: 9–10).

I am grateful to my dearest lifelong friends Angela Marie, Cheryl Jean, Brenda Gayle, Nancy Pearl, and Tanya Nicole who helped me realize my worth and inspired me to become the woman God created me to be. You have been an invaluable source of strength, encouragement, and support during the development of my personal and professional life. “Many daughters have done well, but you excel them all” (*King James*

Bible, 1769/2017, Proverbs 31:29). I am eternally grateful to God for putting you all in my life. My love for each of you will never cease; I will always be here for you!

DEDICATION

My amazing, supportive, and goal-achieving husband, Christopher Justin Rabe, and to my blessed, beautiful, and intelligent sons, Conrad Nathan and Gunnar David Rabe.

In Memory and Honor of

Guadalupe "Lupe" Ozuna

Gramps, you were the inspiration behind my pursuit of higher education and academic success. As an amazingly successful businessman with only a seventh-grade education, you inspired me with your courage and strength. It was a great blessing to have you as my grandfather and my main father figure. You will always be in my mind and heart throughout my life, and I will always share your stories and wisdom with all of our future descendants; you will never be forgotten. Thank you for giving me the life I have had—it was beautiful, and I had everything I could have ever needed and wanted!

I love you, Gramps!

Irma Acevedo-Ozuna

Grandma, I miss you every day of my life, but I know you are with me through every life experience. God greatly blessed me by having you as my grandmother and as a mother figure in my early life. My heart still smiles thinking of the beautiful memories we shared and the many times you expressed your love and pride for me. When I was a child, you were the most loving and kindhearted person I knew, but you were also the funniest; whenever I think of you, I laugh or cry. It is an honor to have been named after such an inspiring and beautiful woman as you; I can only aspire to emulate your positive

influence. Your name represents the dignity and respect you exemplified throughout your lifetime, and I will always carry on your legacy.

I love you, Grandma!

Marley Jay Rabe

To my beautiful girl, I miss you every day and wish you were still here with us. You will always be with us and forever have a piece of my heart. You are and will always be the most beautiful girl everywhere you go! You taught me how to be a mama to Conrad and Gunnar and helped me become the person I am today. Thank you for always being there with your unconditional love. Our 14 years together went by too quickly, but I know we will meet again and be together forever!

I love you, my Marley Jay!

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CHAPTER 1: INTRODUCTION

The 2019 novel coronavirus (COVID-19) had a significant impact on public health worldwide and the governments' responsibilities for ensuring the health and well-being of their citizens. According to WHO (2020a), the COVID-19 pandemic has highlighted the critical importance of robust public health systems and investments in public health infrastructures and personnel. Since March 2020, the U.S. government and agencies responded to the pandemic by leading emergency management efforts for the nation while counterparts at the state and local levels were tasked with implementing them. At the local level, the implementation of public health policies and allocation of funds takes place, and it is where the government directly engages with the communities it serves. The collection of disease monitoring data, which is then reported to state, federal, and international health entities, also occurs locally. Because of the nature of the COVID-19 pandemic, federal government recommendations continued to frequently change and required all levels of government and its agencies to communicate these critical updates with citizens. In addition, the pandemic demonstrated what the vital roles of local public health organizations (LPHOs) have in various emergency management activities by leading jurisdiction-wide disease prevention efforts (Li et al., 2020).

This study revealed that collaborative governance is a critical principle, especially during the COVID-19 pandemic, because local jurisdictions have been forced to work together to manage the public health crisis (Ansell & Gash, 2008). Given their interconnectedness, the pandemic highlighted the need for cooperation and collaboration among local governments to address shared challenges. For example, in the United States, the National Association of Counties and the National League of Cities

collaborated to provide guidance and resources to local governments in responding to the pandemic (National Association of Counties, n.d.). Collaborative governance was particularly crucial during the COVID-19 pandemic because it required a coordinated response across multiple levels of government and sectors to allocate resources efficiently, share best practices, and coordinate responses to prevent the virus's spread (O'Toole & Meier, 2017). Collaborative governance is a crucial approach to addressing complex challenges that require the involvement of multiple stakeholders with diverse interests and expertise. Collaborative governance involves sharing power and responsibility among stakeholders, including government agencies, nongovernmental organizations, and community groups (Ansell & Gash, 2008). Local jurisdictions' collaboration enabled them to pool their resources and expertise to develop innovative solutions to the challenges posed by COVID-19. Collaboration also facilitated sharing of information and best practices among different jurisdictions, helping them learn from each other's successes and failures (Heikkila & Gerlak, 2005). Local jurisdictions must continue to collaborate and coordinate their efforts to ensure a more effective response to the pandemic and other challenges in the future.

Risk communication occurs through various mediums like television, radio, word of mouth, and Internet sources. Social media networks are among the most commonly used channels of information on a global scale. These online platform networks' widespread adoption, low cost of entry, and significant user base make them a convenient and efficient method for distributing information (González-Padilla & Tortolero-Blanco, 2020). LPHOs used social media platforms to communicate critical messages and keep the public informed from the pandemic's beginning; this research primarily studied the

risk communication activity of Facebook. Facebook is a social media platform founded in 2004 by Mark Zuckerberg and a group of college students (Hall, 2023). As one of the largest social media platforms, Facebook allows users to create profiles, share photos and videos, and connect with friends and communities (Meta, n.d.). Furthermore, Facebook allowed LPHOs to develop and utilize their public health emergency management network (PHEMnet) to communicate the COVID-19 pandemic risks to form the community's risk perception on the shelter-at-home orders.

Background

Social networks allowed for the immediate exchange of information about the COVID-19 pandemic with public health experts from government officials, LPHOs, and other state and federal public health officials and experts. Because of the pandemic's nature, social media platforms were also the safest means of disseminating critical information to the public during the pandemic. The impact of social media on culture was never more profound than it was during the pandemic because it helped people stay in touch and changed how governments interacted with the community during a significant pandemic (Kushner, 2022). Governments used social media to communicate the COVID-19 pandemic risks to citizens, which increased the functionality of social networks for government to communicate with the community (Jimeno-Almazán et al., 2021). The risk management process during the shelter-at-home orders demonstrated that LPHOs had to quickly adapt and implement safety measures to update local citizens on the pandemic risks to protect them whenever federal and state government officials received updates and communication. Public health communication during a communicable disease event requires a coordinated effort between governments, agencies, and other local

jurisdictions. The pandemic allowed the local government to follow FEMA's National Incident Management System (NIMS) recommendations and best practices (U.S. Department of Education, 2006). Therefore, this study aimed to determine whether LPHOs followed the emergency management standards and framework developed by FEMA and whether that was critical in communicating the shelter-at-home orders with the public (U.S. Department of Education, 2006). Gatewood et al. (2020) stated that by providing critical, relevant, consistent, and engaging content to citizens, public health information can be disseminated more comprehensively through digital platforms accessible on cellular phones, computers, tablets, and other internet-capable devices. This study sought to determine whether LPHOs effectively communicated public health messages on social media platforms by analyzing the social network size, composition, and information content type. Jimeno-Almazán et al. (2021) emphasized that social media has had a negative impact on the spread of COVID-19 because it has led to the spread of rumors, jokes, and misinformation about the cause, treatment, and prevention of the disease. This misinformation has promoted unhealthy behaviors and unfair practices, which increased the spread of the virus and ultimately caused adverse physical and mental health outcomes. Therefore, LPHOs and governments must have a robust online presence to actively engage with communities to share accurate information and counter false claims (Office of the Surgeon General, 2021).

Since 2002, CDC has provided annual funding to states and local jurisdictions to increase public health emergency management (PHEM) capabilities and local community resiliency through the Public Health Emergency Preparedness (PHEP) program to improve public health preparedness and response to public health threats and

emergencies (CDC, n.d.-c). The PHEP program provides funding, training, and technical assistance to health departments across the United States to build and sustain core capabilities necessary for an effective public health response (CDC, n.d.-c). PHEP aims to ensure that LPHOs are equipped to respond to public health emergencies quickly and effectively and to prevent the spreading of infectious diseases. With this annual funding, state and local public health agencies have the financial resources to develop emergency management capabilities. Following the terms outlined in the funding agreement, every organization receiving PHEP funding must establish readiness capabilities within 5 years. In addition, the CDC provides personalized guidance, expert support, and assessment capabilities to ensure all jurisdictions are prepared to deal with public health hazards (Burrous, 2021).

Infectious diseases can quickly become pandemics because of various illness factors, such as symptoms, mortality rate, infection rate, and other related issues. LPHOs must be prepared to respond to all types of hazards. LPHOs must also implement federal and state guidance, rules, and policies within their community to ensure public health measures are a consistent effort from all levels of government. Therefore, LPHOs in Texas must communicate with their regional state public health agency and other influential local public health stakeholders to ensure that all government levels are involved and know the potential infectious disease risks to determine the necessary response activities. These routine public health efforts have allowed "infectious disease surveillance and response systems at all levels to be more effective at identifying and preventing the spread of infectious diseases" (Nsubuga et al., 2006, p. 1005). This study is relevant because LPHOs is the government's authority that leads local emergency

management activities during public health-related events, including shelter-at-home orders.

Purpose of the Study

The purpose of this study was to evaluate the risk management processes used by the LPHOs to suggest the most effective approaches during the COVID-19 pandemic shelter-at-home orders. Public health is a branch of public administration devoted to preventing illness, increasing life spans, and advocating for healthy lifestyles. Public health combines science and art through coordinated campaigns and informed decisions of society, organizations, the public, and the private sectors (CDC, n.d.-c). Every level of government has different roles and responsibilities during a public health event, making collaborative governance and risk communication integral components when serving the community during a pandemic. Risk communication today includes social media platforms, such as Facebook, Twitter, Instagram, YouTube, and others. This study primarily focused on the COVID-19 pandemic and the LPHO's risk management process, from implementing shelter-at-home orders to communicating this mandate to the public on Facebook. This study examined how LPHOs used social media to connect with the public. Collaborative governance was highlighted as an output of an integrated emergency management system, and a lack of integration was described as a precursor for inconsistency and uncoordinated emergency actions. Finding the right balance of separation and connectedness in collaborative governance between government agencies and other local jurisdictions is paramount (Khan et al., 2018). This study analyzed the LPHOs' Facebook posts and community comments to determine their overall effectiveness and impact on the consideration to provide further insight into their

usefulness and impact on shaping the community's risk perception throughout the pandemic.

Research Approach

This study analyzed the local risk management processes of the three South Texas counties of Hidalgo, Cameron, and Nueces to determine their causative impact on the local community's risk perception toward the COVID-19 pandemic. Content and sentiment analysis (SA) identified patterns and forces that connected and influenced citizens during the COVID-19 pandemic's local shelter-at-home orders. According to Paulik et al. (2020), when information regarding a developing crisis is sourced from multiple channels with conflicting messages, individuals tend to give more credibility to information originating from a trustworthy source. Therefore, LPHOs must develop and maintain a risk management process integrating a unified command approach that uses collaborative governance and risk communication to inform the public. LPHOs can create a sense of transparency and accountability, which is critical for building trust and legitimacy (WHO, 2020-b). When the public is well-informed about the nature, likelihood, and consequences of risks to their health, they are more likely to have confidence in public health organizations and be willing to follow their guidance (CDC, n.d.-c). In addition to building trust and legitimacy, effective risk communication can foster cooperation, facilitate the community's behavior, and have more informed decision making. As stated by CDC (n.d.-b), when individuals and communities understand their risks and the measures to address them, they are more likely to support public health efforts and comply with recommendations and guidelines.

Moreover, this research aimed to evaluate PHEMnet at the local level to determine whether it is following the best practices established by FEMA. Based on the literature review and public health professional experience, this researcher proposed a PHEMnet model to visually demonstrate the risk management process used when implementing the shelter-at-home orders and communicating these mandates to the community. PHEMnet uses FEMA's (2017) NIMS framework to develop a specific emergency management model that focuses on the LPHOs as the lead agencies during a public health disaster, developing and implementing an emergency management action (shelter-at-home order) and forming the community's risk perception through effective risk communication methods on a social media platform. (FEMA, 2017). PHEMnet includes collaborative governance and risk communication as the principles that guide the LPHOs' risk management process during an emergency.

The COVID-19 pandemic demonstrated the importance of LPHOs and their essential public role in coordinating local emergency management efforts to control the spread of the virus, including implementing local shelter-at-home orders. These local orders required individuals to stay home except for essential activities, such as obtaining food, medical care, and essential work, to slow the virus's spread. Moreover, the effectiveness of these orders was reliant on the willingness of the public to comply; this is when the local public health risk communication process becomes crucial (WHO, 2020a). By providing clear, concise, and consistent information about the risks posed by the COVID-19 pandemic and the reasons for the shelter-at-home order, public health organizations can help increase community understanding and support for these measures. This emergency management model emphasizes the importance of LPHOs to

build trust and increase public understanding of emergency management activities meant to protect the community from public health illnesses and threats. PHEMnet can help ensure that the public is well informed about the risks posed by the COVID-19 pandemic and the reasons for the orders, which can increase the likelihood of compliance.

This emergency management model measured the participatory behavior within the social network by evaluating the shelter-at-home order specific to Facebook posts of three South Texas jurisdictions, which included three county governments and two municipal governments: (a) Cameron County, (b) Hidalgo County, (c) Nueces County, (d) City of Brownsville (Cameron County), and (e) City of Corpus Christi (Nueces County). Furthermore, the evaluation of Facebook posts published by these jurisdictions were analyzed by the LPHOs to determine the effectiveness of the risk management processes utilized by the LPHOs during the shelter-at-home orders.

Research Questions

The following research questions allowed the researcher to analyze the LPHOs' risk management processes during the COVID-19 pandemic shelter-at-home orders:

1. What was the most effective PHEMnet used by the LPHOs to effectively communicate the shelter-at-home orders with the community?
2. Does unified command play a role in an LPHOs' risk communication and the community's risk perception during a pandemic?

Theoretical Framework

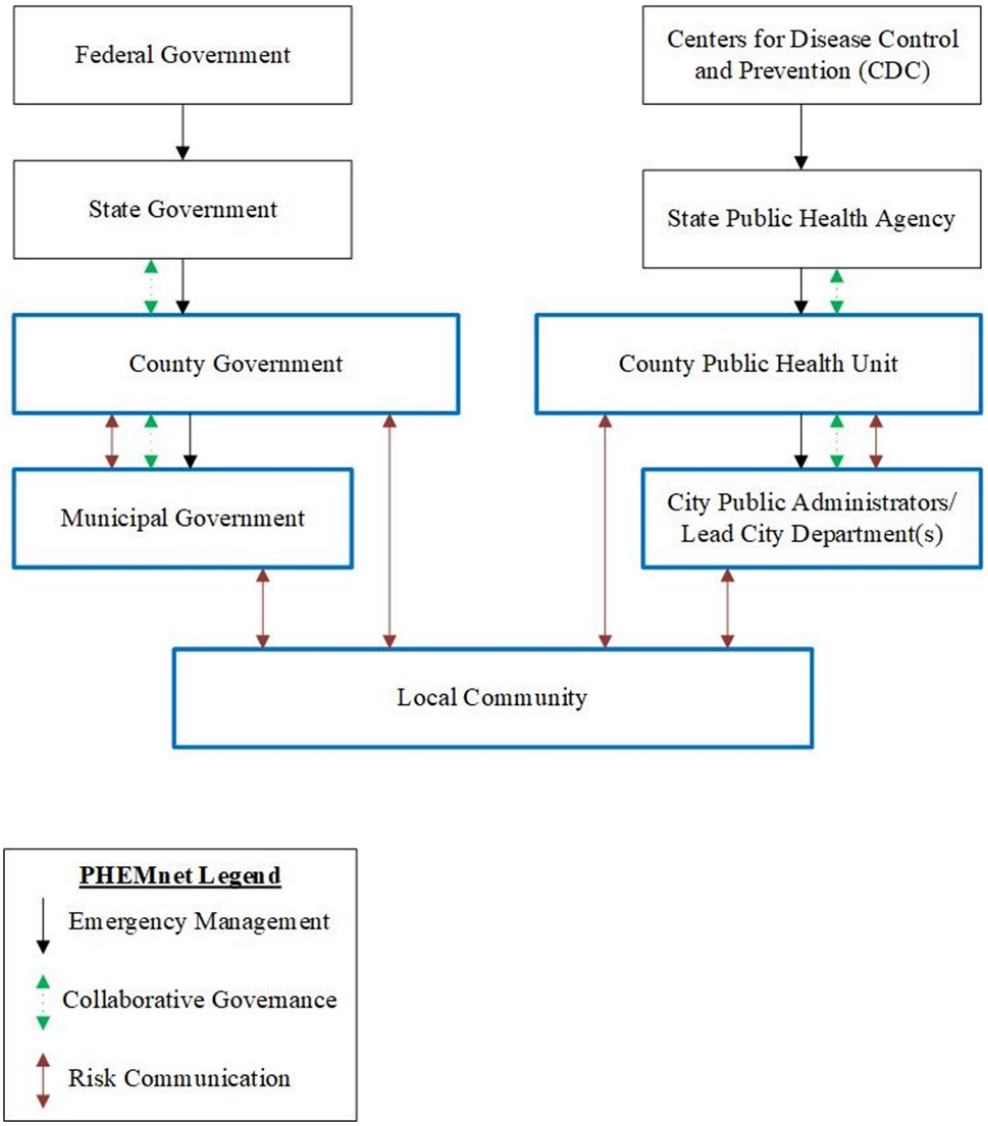
The risk perception theory assessed the impact of the LPHOs' risk communication messages published on Facebook during the shelter-at-home orders. This theory provided the researcher with a framework to understand how individuals perceive

and respond to risks, including trust in authorities and access to information (Luhmann, 1979; Slovic, 2000). The researcher used this theory to develop a risk management process model known as the PHEMnet (refer to Figure 1). This study incorporated two essential components of the risk management process to gather data findings, collaborative governance, and risk communication. Collaborative governance and risk communication are two factors that provided insight into data findings by demonstrating their foundational components within the PHEMnet to have practical risk communication activities between the LPHOs and the community. The risk perception theory explains how individuals and groups perceive and respond to risks. This theory claims that people's risk perceptions are shaped by their knowledge, experiences, cultural background, and emotions (Slovic, 2000).

This theory also recognizes that different people may have different perceptions of the same risk and that these perceptions can impact their behavior and decision-making processes (Renn et al., 1992). Collaborative governance is critical in the risk management process because it involves the participation of various stakeholders in decision making and risk mitigation activities (Jones, 2019). This approach allows for a comprehensive evaluation of risks, considering different perspectives, resources, and expertise (Brown, 2018). By working together, the parties involved can make informed decisions and take practical actions to manage risks. The governing body and local public health organization leading the emergency response activities should ensure that all necessary intergovernmental agencies and influential jurisdictional partners are identified.

Figure 1

Public Health Emergency Management Network (PHEMnet)



Moreover, a risk management process must be in place so the organizations involved can collaborate effectively (Gonah & Kobie, 2021). Public administrators who apply collaborative governance need to determine which areas of their work will require assistance from other partners to develop and implement specific policies and programs for the community. Selecting appropriate initiatives allows the government to justify to

the community and other stakeholders a "well-founded expectation that engaging collaborators will produce more public value, relative to the resources used, than the public sector could deliver on its own" (Donahue et al., 2011, p. 35).

Risk communication approaches must also be considered for an effective risk management process. Risk communication involves exchanging information about risks between individuals, organizations, stakeholders, and the public (Emanuel, 2000). Risk communication aims to provide accurate and understandable information about risks and to involve stakeholders in risk management decisions (Covello, 2000). The combination of risk perception theory, collaborative governance, and effective risk communication provides a comprehensive approach to risk management. Public administrators can better understand and address concerns that may impact decision making by considering individuals' and groups' perceptions of risks related to the emergency.

Effective risk communication also helps to provide accurate and understandable information about risks and to promote informed decision making. Furthermore, the risk perception theory's applicability allowed LPHOs to use this practice during the ongoing COVID-19 pandemic and future public health emergencies to determine the community's behavior and acceptance of emergency management actions. Local risk communication activities must incorporate different community facets to ensure that emergency activities and efforts are designed to serve that community's population. For instance, if a local community has a large population of elderly individuals, the risk management process should include measures that provide public health services to allow easy access to this population subtype. Understanding and developing public health policies and practices in each community are unique and "beneficial because there exists a shared understanding

of public health problems, transparency about efforts to improve health and treat illness, and better public support for each partner and the partnership" (Pestronk et al., 2013, p. 4). This study evaluated each local public health organization's risk management process to assess its effectiveness in communicating shelter-at-home orders to the community during the COVID-19 pandemic.

Definitions

This section provides definitions of the terms referenced throughout the study.

2019 Novel Coronavirus (COVID-19). A contagious disease caused by a coronavirus. Although most individuals infected with the virus may only experience mild-to-moderate respiratory symptoms and recover without medical intervention, elderly individuals and those with preexisting medical conditions, such as diabetes, cancer, cardiovascular disease, and chronic respiratory disease, are at a higher risk of developing severe illness (WHO, 2020b).

Centers for Disease Control and Prevention (CDC). The federal agency responsible for developing and implementing disease prevention and control, environmental health, and health promotion and education programs to enhance people's health in the United States (CDC, 2001).

Collaborative Governance. The processes and structures of public policy decision making with public agencies, different levels of government management that carry out a public service and purpose that could not otherwise be accomplished (Emerson et al., 2012).

Emergency Management. A field of emergency management that focuses on identifying and mitigating risks, especially those that could devastate local communities,

states, entire nations, or global populations. Managing an emergency involves preparing, responding, and recovering from it by minimizing its impact and assisting individuals and communities in rebuilding and recovering (FEMA, 2013).

Epidemic. A disease or other specific health-related behavior with rates above the expected occurrence in a community or geographical region (Columbia University, 2021).

Facebook. A social networking service launched in 2004 that allows users to connect and communicate with friends and family members, share photos and videos, and engage with a wide range of content, including news and entertainment. As of December 2021, it had over 2.9 billion monthly active users worldwide (Meta, n.d.).

Federal Emergency Management Agency (FEMA). A federal government agency responsible for coordinating and managing the federal response to disasters in the country. FEMA is also responsible for developing and implementing federal emergency management policies (FEMA, 2021).

Incidence Rate. A measure of the frequency with which new cases of a disease or condition occur within a population over a specified period. It is expressed as the number of new cases per unit of the at-risk population (CDC, n.d.-c).

Infectious Disease. A medical condition caused by the invasion and growth of pathogenic microorganisms, such as bacteria, viruses, fungi, or parasites, in the body. These microorganisms can cause various symptoms, from mild to severe. These diseases can be transmitted from one person to another through various modes of transmission, such as direct contact, airborne droplets, contaminated food or water, or insect bites.

Infectious diseases are a significant public health concern worldwide because they can seriously affect individuals, communities, and entire populations (WHO, n.d.-b).

Local Public Health Organization (LPHO). A local government agency that varies in size and the range of services provided based on availability and type of funding, expertise, and need to be determined by the community they serve. According to the Health and Safety Code, Chapter 121 (Texas Public Law, 1989b), public health at the local level is categorized into three forms:

- *Local Health Department*. A local health department comprises public health entities serving the county, city, or county–city jurisdictions. For this study, the state of Texas classified Cameron County Public Health and the Hidalgo County Health and Human Services Department as this type of LPHO.
- *Public Health District*. A public health district consists of two or more counties or municipalities, a county and one or more municipalities in the county, or two or more counties and one or more municipalities in those counties. The state of Texas identifies the Corpus Christi–Nueces County Public Health District as this particular LPHO type.
- *Local Health Unit*. A local health unit is a local municipal or county government division that provides public health services, generally environmental services but not to the level of a department or district.

Mitigation. Disaster management phase that includes actions taken to prevent or reduce the cause, impact, and consequences of disasters (FEMA, 2013).

Pandemic. "An epidemic occurring worldwide or over an extensive area, crossing international boundaries and usually affecting a large number of people" (WHO, 2021, para. 1).

Public Health. The science and art of preventing disease, prolonging life, and promoting health through the organized efforts and informed choices of society, organizations, the public and private communities, and individuals (CDC, 2001).

Public Health Emergency Management Network (PHEMnet). The theoretical framework used to evaluate the risk management processes of the LPHOs analyzed in this study. This process focuses on the issuance of an emergency management order and how it is communicated on Facebook.

Public Health Emergency Preparedness (PHEP).

> A cooperative agreement [and] critical source of funding for state, local, and territorial public health departments. Since 2002, the PHEP cooperative agreement has assisted public health departments across the Nation. This helps health departments build and strengthen their abilities to effectively respond to public health threats, including infectious diseases, natural disasters, and biological, chemical, nuclear, and radiological events. (CDC, n.d.-d, para. 1).

Response. This emergency management phase occurs in the immediate aftermath of a disaster. During this phase, businesses and other operations do not function normally (FEMA, 2013).

Risk Communication. Real-time exchange of information between experts and the people facing a common threat to their survival, health, or well-being (WHO, n.d.-c).

Risk Perception. Involves a subjective evaluation of the likelihood of harm, the degree of perceived control over the hazard, and the severity of the potential consequences (Slovic, 2000).

Texas Division of Emergency Management (TDEM). An agency that serves the state of Texas by managing the all-hazards emergency management plan for the state (Texas Public Law, 1989b).

Texas Department of State Health Services (DSHS). A Texas state agency that is in place "to improve the health, safety, and well-being of Texans through good stewardship of public resources, and a focus on core public health functions" (DSHS, n.d.-a, para. 3).

Summary

The COVID-19 pandemic demonstrated the importance of LPHOs in responding to public health emergencies at the global, federal, national, and local levels. LPHOs played an essential public role during the pandemic by coordinating local emergency management efforts to control the spread of the virus including implementing shelter-at-home orders. These local orders required individuals to stay home except for essential activities, such as obtaining food, medical care, and essential work to slow the virus's spread. Moreover, the effectiveness of these orders was reliant on the willingness of the public to comply (Moreland et al., 2020). Collaborative governance is the first guiding principle recognized in this study that involves the active participation of multiple stakeholders in decision making and can play a critical role in ensuring effective risk communication (CDC, n.d.-c). By bringing together local public health agencies and other organizations, collaborative governance ensured that clear, consistent, and accurate

messages were being communicated to the public about COVID-19. In addition, collaborative governance publicly demonstrated the solid or weak relationships between LPHOs. Risk communication is the second guiding principle necessary for effective community engagement to help the LPHOs increase public understanding and support for the shelter-at-home orders and amendments (CDC, n.d.-c). A study by Kim and Zhong (2020) emphasized the importance of effective risk communication on social media platforms such as Facebook during the COVID-19 pandemic. Their study found that accurate and transparent risk communication by health authorities and credible sources on Facebook could help to reduce public anxiety and improve compliance with public health guidelines. This study used a mixed methods approach to determine whether the community trusted its local public health officials and supported the shelter-at-home orders in the three South Texas counties of Cameron, Hidalgo, and Nueces.

CHAPTER 2: REVIEW OF LITERATURE

This chapter explores the history of public health and the evolution of the subfield referred to as public health emergency management (PHEM). The literature review demonstrates the significance of local public health organizations (LPHOs) during an emergency and the importance of collaborative governance and risk communication activities to keep local communities informed by using Facebook to disseminate critical COVID-19 pandemic information. This section discusses the conceptualized theoretical model and the public health emergency management network (PHEMnet). PHEMnet is a multisector public health risk communication model that focuses on two principle guidelines during a public health emergency: (a) collaborative governance between LPHOs and (b) effective risk communication methods to local citizens. These two principles are evaluated using the risk perception theory to analyze the effectiveness of the LPHOs' local shelter-at-home orders. The researcher examined academic and professional literature related to the 2019 novel coronavirus (COVID-19) pandemic to compare and contrast crisis and emergency risk communication efforts via Facebook posts made by LPHOs during the shelter-at-home orders.

Documentation

This study reviewed literature that discusses public health safety measures and risk communication activities during past pandemics and other public health-related emergencies. The following key terms were initially used to identify local public health activities during emergencies: *pandemic*, *public health*, *local government*, *emergency preparedness and response*, *infectious diseases*, and *outbreak*. After this initial literature search, the key terms were expanded to include *emergency management*, *collaborative*

governance, *COVID-19*, *Facebook*, *content analysis*, *sentiment analysis*, and *risk communication*. The California Baptist University Library's OneSearch and Google Scholar were used to conduct these initial searches. In addition, the CDC's website provided the majority of COVID-19 pandemic data and other population health information related to the counties being assessed.

Brief Global History of Public Health

Public health has been a practice among civilizations for many centuries. One of the first recognized texts documenting a historical public health practice was in the third book of the Torah and Bible, the Book of Leviticus. Essentially, the scriptural text provides public health guidance to local leaders and community members that must be followed to prevent the spread of a bacterial infectious skin disease known as leprosy. The public health guidance in the Book of Leviticus mentions disease signs and symptoms, diagnosis criteria, quarantining practices, and decontamination to safeguard the community. Porter (1999) stated, "The Talmudic code continued to influence the development of public health throughout Europe, mainly as Jewish, together with Muslim, physicians played a crucial role in transferring the traditions of classical medicine during the Middle Ages" (p. 13). According to the Institute of Medicine (1988), epidemics like the plague, cholera, and smallpox led to isolated public efforts to protect citizens before the 18th century. The following sections discuss the evolution of public health in the United States from the British colonial period to present-day America.

Colonial America to the United States of America

British colonization brought the concept and principles of England's Poor Law of 1601 to the American colonies. One example from 1629 illustrates this: "The General

Court of Massachusetts Bay Colony acted to protect the public health by limiting the number of passengers on each ship carrying migrants to the new colony" (Quigley, 1995, p. 43). Quigley (1995) explained that prerevolutionary laws established local public health regulations that temporarily assisted those unable to work because of physical illness and mandated labor or imprisonment for those who could work. Moreover, these laws placed a great deal of emphasis on local administration. Parmet (1992) noted that during the colonial period, each colony possessed the power to enact its version of the law because public health organizations were still in their infancy, and the way the law was implemented varied depending on where the colony was located (New England colonies, middle colonies, and southern colonies). The responsibility for disease prevention and care of the sick primarily fell on the public, particularly in the New England colonies and Massachusetts Bay Colony (Parmet, 1992).

Although the Poor Laws primarily focused on the impoverished population of the community, they also commenced the path toward local public administration to implement and oversee public health programs. These colonial public health programs still exist in a particular manner and are administered by LPHOs through allocated funding from federal agencies and programs. For example, Texas enacted the Indigent Health Care and Treatment Act of 1989, which mandates in Section 61 of the Texas Health and Safety Code that counties not fully served by a hospital district or a public hospital are responsible for administering an indigent health care program for indigent residents. (Texas Public Law, 1989a).

During the 18th century, quarantine practices became a standard health measure to prevent the spread of diseases at several colonial American port cities. For example, in

1701, Massachusetts passed laws requiring smallpox patients to be isolated and for ships to be quarantined as necessary by local officials. The Institute of Medicine (1988) highlights that a significant advancement in public health during the earlier part of the century was the adoption of variolation to prevent smallpox. Although the origins of variolation are unclear, some researchers believe that this practice originated in Asia, where individuals seeking inoculation would inhale sun-dried scabs from smallpox pustules. Halbrook (2021) explained that drying the scabs would reduce the potency of the smallpox virus, leading to a milder form of the disease for the inoculated individual.

In addition, variolation was practiced in various regions, such as India, Middle Eastern countries, North Africa, and Europe, by lancing the pustule of a person who was recovering from smallpox and then transferring some of the pustule material into the arm of a healthy individual using the same lance (Halbrook, 2021). The practice of variolation in the American colonies was similar to that of Europe because of the control and public health authority of the English monarchy. During this time, public authorities began to organize community-wide health interventions to raise awareness of illnesses and the acceptance of adopting a new public health system. According to Parmet (1992), the middle colonies, comprising New York, Pennsylvania, New Jersey, and Delaware, made significant advances in public health during, before, and after the Revolutionary War. For example, the yellow fever epidemics between 1793 and 1798 led to the creation of the New York City Board of Health in 1796.

The 19th century ushered in the acceptance of proper sanitation practices used as a necessary public health component that prevented the spread of disease and became a social responsibility for the entire community. For this reason, “Disease control

continued to focus on epidemics, but the manner of controlling turned from quarantine and isolation of the individual to clean up and improving the common environment" (Institute of Medicine, 1988, p. 58). Another notable public health activity in the 19th century was data collection and analysis of the local community's health and socioeconomic demographics (Institute of Medicine, 1988). This census-type activity was pioneered in 1838 by an English lawyer and replicated in America by a well-known Massachusetts bookseller and statistician Lemuel Shattuck. Shattuck published the Massachusetts Sanitary Commission Report in 1850 in which the morbidity and mortality rate was compared between different socioeconomic backgrounds. The report by Shattuck presented the following public health suggestions:

1. Updated census records;
2. Frequent assessment of local health status;
3. Monitoring of water supply and waste management;
4. In-depth examination of illnesses such as tuberculosis and alcoholism, training for healthcare professionals in preventive medicine; and
5. Creating local health information networks and establishing state and local health boards to enforce health regulations (Institute of Medicine, 1988, p. 61).

These data-driven reports promoted the practice of infectious disease surveillance in the United States by 1878. Also during this year, the U.S. Congress authorized the U.S. Marine Hospital Service, which later became the Public Health Service, to gather reports on the prevalence of cholera, smallpox, plague, and yellow fever from U.S. consuls stationed abroad. Based on the collected data, reports were compiled and released

regarding these diseases (CDC, 1996b). By 1879, Congress appropriated funds to collect and publish reports for the notifiable diseases. Fourteen years later, in 1893, the weekly reporting was expanded to include state and municipal authorities' statistical data. According CDC (1996b), all states, and the District of Columbia, Hawaii, and Puerto Rico, reported 29 infectious diseases to the surgeon general by 1928. These efforts and others set the foundation for the public health systems that the United States has instituted today.

With the growth in health-related research, the 20th century prompted public authorities to expand and take on new public health responsibilities, including sanitation, immunization, regulation, health education, and personal health care. The establishment of the Communicable Disease Center as a federal agency in 1946 aimed to prevent the spread of malaria across the United States (CDC, n.d.-b). As a result, the United States was declared malaria-free by 1949, and by 1951, malaria was considered eliminated in the country (CDC, n). In addition, in 1947, CDC provided disaster assistance to Texas City, Texas, for the first time in response to multiple large chemical explosions because of the explosion of the French vessel SS Grandcamp (CDC, n.d.-b). The 1950s introduced new public health issues for the CDC to expand its public health influence, such as through the creation of the Epidemic Intelligence Service (EIS) because of the threat of biological warfare from the Korean War and the 1955 vaccine-related poliomyelitis incident that affected children who received the approved Salk vaccine. In 1957, the surveillance efforts for the influenza epidemic led to the development of the national guidelines for the influenza vaccine, the establishment of a venereal disease program, and the first CDC-recognized public health advisors (CDC, 1996b). During the

1960s, the CDC grew because of acquiring previously established programs transferred from the U.S. Public Health Service. The established programs that CDC acquired included the tuberculosis program, immunization practices, the *Morbidity and Mortality Weekly Report*, the Foreign Quarantine Service, the nutrition program, and the National Institute for Occupational Safety and Health (CDC, 1996b).

The CDC expanded its public health impact throughout the 1970s and changed its name to the Center for Disease Control to reflect its expanded public health activities. A significant CDC achievement occurred in 1977 because of its fundamental role in eradicating smallpox in the United States. The success of this achievement prompted the WHO to use the U.S. eradication escalation technique in other parts of the world; these efforts resulted in the global eradication of smallpox by 1977. In 1981, the word *Center* in CDC changed to *Centers* after an extensive reorganization of the federal agency; the current name, Centers for Disease Control and Prevention, was established in 1992 by Congress to recognize CDC's leadership role in prevention and response (CDC, 1996a). Moreover, throughout the 1990s, CDC contributed different types of scientific research and public health initiatives toward various public health areas, such as prenatal care, congenital disabilities, tobacco exposure risks, vector-borne disease identification, participation in the Global Polio Eradication Initiative, and other notable achievements (CDC, 1996a). In 1999, CDC expanded emergency preparedness capabilities by establishing the National Stockpile, now known as the Strategic National Stockpile, and the Laboratory Response Network; these two programs are still part of the CDC's effort to assist state and local health organizations during public health emergencies (CDC, n.d.-a).

The Evolution of Public Health Emergency Management

The transition to include the field of public health as an essential factor of emergency management at the federal level took place soon after September 11, 2001, terrorist attacks and subsequent anthrax attacks. After these disasters, the federal government determined that LPHO also needed resources to strengthen community resiliency during emergencies and disasters. Moreover, according to Vielot (2014),

> In recent years, given the reduced threat of bioterrorism and increased threat of emerging infectious diseases, the importance of public health in emergency response has earned great recognition, and efforts have increased to bridge the divide between emergency management and public health preparedness. (p. 2913)

These events established a joint public health collaboration between federal, state, and local public health agencies.

The field of PHEM emerged as a result of health impacts because of naturally occurring and human-caused threats. This field of practice has historical significance in bringing public health to the forefront of emergency response during public health emergencies. Rose et al. (2017) expressed that before the establishment of PHEM, public health practitioners would lead or support response efforts in several infectious disease emergencies and environmental and technological catastrophes, including hurricanes, floods, and industrial chemical releases with zero to very minimal assistance from local emergency management administrators. In the past, emergency managers relied on the command and control model, using local law enforcement, fire departments, and emergency medical services to carry out government-mandated response activities (Vielot, 2014).

During the 21st century, public health departments have evolved to integrate emergency management principles into practice and are viewed as a critical component of the emergency management system throughout all levels of government. In 2002, Congress established the Public Health Emergency Preparedness (PHEP) Cooperative Agreement to assist LPHOs across the nation in preparing for emergencies in their local jurisdiction by being the primary source of funding (CDC, n.d.-a). According to the CDC (n.d.-c), the PHEP program is managed by the CDC and consists of 15 capabilities that function as national benchmarks for planning public health readiness. The PHEP program enables LPHOs to

> build and sustain information and communication systems, establish routine surveillance for infectious diseases, build knowledge and expertise in risk communication and community engagement, establish and exercise plans for mass dispensing, address vulnerable populations in preparedness and response, and many other gains. (Watson et al., 2017, p. S166)

The PHEP program, overseen by the CDC, has led to notable improvements in local jurisdictions' PHEM capabilities.

Watson et al. (2017) stated that recent federal investments to enhance emergency preparedness and management capacities in states and local communities have led to significant advancements in disaster preparedness and improved infrastructure for public health in communities. The CDC is responsible for disease surveillance and investigating emerging threats at the federal level, and state and local public health departments take the lead in detecting, preventing, and controlling infectious diseases in their communities (Dicker et al., 2006). The expansion of public health in all levels of government has

further demonstrated the impact unified efforts can have on an operation. Furthermore, the acceptance that public health responsibilities rely on every level of government also assists in the identification of specific roles and responsibilities each public health organization has to prevent the spread of disease.

Importance at the Federal and State Levels

Since implementing federal initiatives to strengthen community resiliency during the turn of the 21st century, PHEM capabilities have expanded through federal support, other grant funding, and resources. As PHEM advancements continue and the field of public health becomes more involved in various emergency management efforts, LPHOs have more responsibilities and roles during a disaster's life cycle (Rose et al., 2017). Moreover, the type of disaster and its public health implications for the citizens also determine the level of collaboration and influence an LPHO has during an event (U.S. Department of Homeland Security [DHS], 2019). The following is an excerpt from the directive that demonstrates the recognition of emergency management as a field that requires federal support to expand and progressively evolve as an all-of-nation, shared civic duty:

> This directive was aimed at strengthening the security and resilience of the United States through systematic preparation for the threats that pose the greatest risk to the security of the Nation, including acts of terrorism, cyber-attacks, pandemics, and catastrophic natural disasters. Our national preparedness is the shared responsibility of all levels of government, the private and nonprofit sectors, and individual citizens. Everyone can contribute to safeguarding the Nation from harm. As such, while this directive is intended to galvanize action by the Federal

> Government, it also aims to facilitate an integrated, all-of-Nation, capabilities-based approach to preparedness. (DHS, 2019, para. 1).

Therefore, the LPHO may be required to be the lead local government agency to respond effectively to a public health emergency so that their emergency management activities can influence the overall national goal of developing more resilient communities.

A state's public health authority is derived from the police powers granted in their respective state constitutions and the 10th Amendment in the U.S. Constitution (Shapiro, 2020). Since 2002, CDC's PHEP program funding has supported all state public health agencies to become lead partners in local emergency management activities. With legal authority and federal financial resources, state health agencies can administer the PHEP program or distribute the funding to LPHOs based on their state public health structure. Four identified public health organizational structures exist in the United States, including centralized or largely centralized, shared, mixed, and decentralized or largely decentralized. Table 1 provides the four public health structure types developed and described by the Association of State and Territorial Health Officials (ASTHO, n.d.). The jurisdictions in this study were primarily decentralized and worked with DSHS Region 11 during regular or emergency operations. Regardless of the public health structure, each state must demonstrate and report all PHEP activities to CDC throughout the grant period. LPHOs receiving PHEP funding must provide reports periodically to their state health agency representatives to demonstrate grant compliance.

Table 1

ASTHO State Public Health Structures

Structure type	Description	States
Centralized/largely centralized	State employees primarily lead local health units, and the state retains authority over most fiscal decisions.	Centralized states: Arkansas, Delaware, DC, Hawaii, Mississippi, New Mexico, Rhode Island, South Carolina, and Vermont Largely centralized states: Alabama, Louisiana, New Hampshire, South Dakota, and Virginia
Shared	Local health units may be led by employees of the state or of local government. The local government can make financial decisions and issue public health orders if state employees lead them.	Florida, Georgia, and Kentucky
Mixed	Employees of the state lead some local health units, and local government employees lead some. No one arrangement predominates in the state.	Alaska, Maine, Oklahoma, Pennsylvania, Tennessee, and Wyoming
Decentralized/largely decentralized	Employees of local governments primarily lead local health units, and the local governments retain authority over most fiscal decisions.	Decentralized states: Arizona, California, Colorado, Connecticut, Idaho, Illinois, Indiana, Iowa, Kansas, Massachusetts, Michigan, Minnesota, Missouri, Montana, Nebraska, New Jersey, New York, North Carolina, North Dakota, Ohio, Oregon, Utah, Washington, West Virginia, and Wisconsin Largely decentralized states: Nevada and Texas

Note. ASTHO = Association of State and Territorial Health Officials.

In doing so, state governments can properly monitor local public health efforts and their effectiveness in controlling health problems. Most states maintain the primary

control over governance at the state legislature level, which includes the authority to preempt local law that defines local governments and outlines the scope of their control (Pomeranz et al., 2019). State public health agencies act as residual grantors of public health services; therefore, the state agency serves jurisdictions that do not have an LPHO (Turnock, 2015). For example, DSHS (n.d.-b) has 11 regional offices responsible for the public health needs in different areas of the state through direct services and for overseeing the LPHOs that provide direct public health services. This type of local–state relationship demonstrates how emergency management is significant for LPHOs because of the state health agency's heavy reliance on the implementation and execution of the PHEP program by LPHOs.

Local Public Health Organizations

The public health advancements and recognition received from effective policies and public health measures led to increased federal financial resources through grants and direct funding opportunities. In addition, as previously discussed, state and LPHOs receive funding via the CDC's PHEP Cooperative Agreement to develop a more resilient community during disasters and emergencies. There are 64 established local health departments in Texas and 45 participating in the PHEP program. Local PHEP programs collaborate with various partners to enhance the preparedness of Texas regions and local health departments and to respond efficiently to public health emergencies (CDC, n.d.-d). Public health administrators are responsible for developing an inclusive environment that reflects the community's diversity, which involves government officials and public administrators (CDC, n.d.-c).

Theoretical Framework: Risk Perception Theory

This study examined the risk communication activities conducted by LPHOs during the shelter-at-home orders to determine whether the risk management processes that each LPHO used were effective. This study explored the risk management processes and command approach used by each LPHO toward collaborative governance and risk communication during the pandemic. These models provided the researcher with established emergency management standards to analyze how they were used locally in three South Texas counties: Cameron, Hidalgo, and Nueces. The risk perception theory was used in this study to understand the overall community influence of the LPHOs during the COVID-19 pandemic and local shelter-at-home orders. This theory focuses on how individuals perceive and respond to risk and considers factors, such as the perceived severity and likelihood of a risk and the individual's level of trust in the information sources (Slovic, 1987). In addition, this study aimed to develop the concept of PHEMnet as a framework that can describe the local risk management process used to mandate the orders and then communicate the risks to the public via Facebook. The researcher determined the most effective PHEMnet structures by identifying each jurisdiction's unified command approach and Facebook activity.

Risk perception theory attempts to explain how individuals perceive and evaluate environmental risks. During the COVID-19 pandemic, the risk perception theory presented significant implications for emergency management because government officials could communicate the risks of this virus using an online platform to shape the community's perception of it during this emergency. This phenomenon was witnessed during the pandemic when many people felt individual and communal public health

threats because of the frequent hospitalizations and fatalities regularly reported (WHO, n.d.-a). Studies have shown that people tend to overestimate the risk of rare but severe events such as a deadly pandemic and underestimate the risk of more common, less severe events such as seasonal flu (Slovic, 2000). In addition, risk perception is influenced by various factors, such as personal values, beliefs, and emotions (Renn, 2004). Recent research has indicated that individuals with greater risk perception are more likely to engage in preventive measures, including adherence to local mandates (Cipolletta et al., 2022). The risk perception theory helps explain how individuals made sense of the risk posed by the COVID-19 pandemic and made decisions accordingly. However, the complexity of the pandemic highlighted the influence of multiple factors and the need for continued research and understanding of risk perception during such events. Understanding risk perception is crucial for effective risk management processes, particularly when using collaborative governance and risk communication as guiding principles.

Collaborative Governance

Effective collaboration between LPHOs requires a shared understanding of the risks posed by public health issues; therefore, incorporating the principles of risk perception theory into the collaborative governance process can help facilitate this understanding. Risk perception theory examines how individuals understand and respond to environmental risks (Gray & Ropeik, 2002). In collaborative governance, understanding risk perception is crucial for developing more inclusive and effective risk management strategies that all levels of government can use. Collaborative governance involves bringing together various stakeholders, including government agencies and other

local public health stakeholders, to address complex policy issues and risks (Ansell & Gash, 2008). Effective collaborative governance requires an understanding of how different stakeholders perceive risks. For example, government agencies may prioritize different risks than community groups or private sector organizations. By considering the different perspectives of all stakeholders, collaborative governance can help to develop risk management strategies that are more inclusive and effective.

Collaborative governance between LPHOs involves various stakeholders working together to make decisions and develop policies related to public health (Ansell & Gash, 2008). This approach helps address the complexities of public health issues by bringing different perspectives, resources, and expertise to the table. By working together, LPHOs can create more effective and efficient policies that their local community will follow. By involving individuals with different backgrounds, experiences, and perspectives in the decision-making process, all relevant information can be considered, and different perspectives are considered. Establishing relationships among other agencies inside and outside the county's governing body during a pandemic can allow LPHOs to respond more effectively throughout the disaster's life cycle. Collaborative governance is an integrated framework defined as the particular mode of public decision making in which cross-boundary collaboration between different stakeholders represents the prevailing pattern of behavior and activity influencing local policies and programs (Emerson et al., 2012). This practice emphasizes a sense of mutuality, connectedness, and passion for creating public value for LPHOs (McIvor, 2019). Furthermore, collaborative governance fosters the environment for government and public administrators to have a wider

problem-solving frame and challenge the traditional occupational identity of reactive command and control (Bosomworth et al., 2017).

At the community level, collaborative governance typically consists of local governments, intergovernmental departments, and other local jurisdictions to address problems in a world that is becoming more interdependent and networked (Ansell & Gash, 2008). According to O'Toole (2000), collaborative governance involves the government taking on a critical managerial role by coordinating tasks across different sectors best suited for organizations with the necessary skills, knowledge, and resources the government does not have or that would be too expensive to acquire. In addition, local public administrators are tasked to incorporate public values to maintain civic order while building trust and increasing civic engagement through education and services (McIvor, 2019). Collaborative governance between LPHOs has become an essential standard of practice for addressing the complexities of public health issues. Incorporating the principles of risk perception theory into the risk management process can lead to better outcomes by ensuring that various perspectives inform policies and that the community's needs are considered.

Risk Communication

The literature has indicated that effective public health risk communication is crucial to inform the public about potential health hazards and to promote behavior change to protect individuals and communities (Glik, 2007). The risk perception theory is also crucial in understanding effective public health communication efforts because it can provide LPHOs with a better understanding of how the public perceives its emergency management actions. Effective communication can increase the likelihood that the public

will receive, understand, and act upon the information provided by LPHOs (Kasperson & Kasperson, 1996). Factors that can impact the effectiveness of risk communication include the source's credibility, the mode of communication, and cultural context. Therefore, risk communication messages should be tailored to the target audience's values and beliefs to increase risk communication's effectiveness and promote positive behavior changes to protect the community's public health. Poor risk communication can lead to increased public fear and mistrust, as seen in the 2003 SARS outbreak in Asia and the 2014 Ebola outbreak in West Africa. On the other hand, effective risk communication played a crucial role in reducing the spread of the H1N1 influenza pandemic in 2009 (Gostin & Hodge, 2016).

Emergency management has developed into a standardized, coordinated effort between different levels of government and across multisectoral organizations that encompasses various activities to ensure the public is protected during an emergency. In 2002, the integration of FEMA into the newly established DHS resulted in the most significant government restructuring in the past 50 years in terms of emergency management (McEntire, 2015). Since then, emergency management has become integral to local communities because it allows for coordinated efforts between local, state, and federal governments.

The National Incident Management System (NIMS) developed by FEMA includes the Incident Command System (ICS), which is a crucial element during all types of emergencies. ICS uses a standardized organizational framework to combine elements, such as facilities, equipment, personnel, procedures, and communications, to manage domestic incidents effectively and efficiently (FEMA, 2017). NIMS provides a

comprehensive approach to incident management, including preparedness, response, recovery, and mitigation activities, for all incidents, regardless of size or complexity. In addition, it is designed to improve coordination and cooperation between government and private sector levels during emergencies and disasters (DHS, 2019). NIMS is based on principles, best practices, and standardized procedures that enable emergency responders to work together effectively. These principles include (a) integrated communications, (b) unified command, (c) common terminology, (d) modular organization, (e) manageable span of control, (f) consolidated action plans, (g) flexible and scalable operations, and (h) comprehensive resource management (FEMA, 2022). Implementing NIMS and ICS has resulted in greater coordination and interoperability among emergency responders and improved response to emergencies and disasters. In addition, the widespread adoption of NIMS and ICS has led to more efficient and effective emergency response and a shared understanding of incident management across all government and the private sector (McEntire, 2007).

Summary

As public health organizations became more integral agencies during emergencies, popularity grew among the public to receive updates and news from officials during the COVID-19 pandemic. The community increasingly turned to Facebook to gather the most current information on the pandemic at the federal, state, and local levels. A study by the Pew Research Center found that over two thirds of American adults use Facebook to get news (Shearer & Matsa, 2018). Therefore, social media has become an integral tool that governments can use to effectively communicate risks to the public. LPHOs have been using Facebook to communicate the risks associated with the

COVID-19 pandemic. Jha et al. (2016) recognized the effect that social media allows organizations to have when communicating risk information to large audiences. Using Facebook, these organizations can provide regular updates on the COVID-19 pandemic by educating the public on the importance of following mandated and recommended public health guidelines and sharing critical health information to help prevent the further spread of the virus.

In the case of the COVID-19 pandemic, Facebook became an essential source for people seeking up-to-date information on the latest developments, including the number of confirmed cases, new treatments, and government policies. The purpose of evaluating the risk communication approaches of LPHOs using Facebook was to understand the effectiveness of these emergency management activities because they used collaborative governance and risk communication to mitigate the pandemic in their jurisdiction. In addition, evaluating government risk communication approaches on Facebook can help LPHOs determine the best methods for effectively communicating public health information and reducing the spread of infectious diseases in the future.

CHAPTER 3: RESEARCH METHODOLOGY

Social media platforms became an essential daily communication tool used by local public health organizations (LPHOs) during the 2019 novel coronavirus pandemic (COVID-19) to control and disseminate critical messages to citizens regarding shelter-at-home orders and other related information. Risk communication via these platforms allowed LPHOs to connect local citizens with the national goal of decreasing the COVID-19 pandemic infection rate in the United States. Existing studies have shown that Facebook data can provide helpful information for public health emergencies and diseases, including tracking evolving public sentiments and measuring public interests and concerns (Rianto & Pratama, 2021). Therefore, Facebook has the potential to enable organizations to create social communities with citizens and influence the community's risk perception (Wihbey, 2015). This study identified the risk management process between the LPHOs and the community. This study conducted a multicase study of three South Texas LPHOs' risk management processes to determine whether their public health emergency management network (PHEMnet) influenced the community's risk perception during the local shelter-at-home orders. This chapter includes the study's research questions, hypotheses, and methodology. The research methodology discussion contains the sample population, instrumentation, data collection process, and analysis.

Research Questions

This study focused on exploring the following two research questions to evaluate the risk management process used by LPHOs during the COVID-19 pandemic shelter-at-home orders:

1. What was the most effective PHEMnet used by the LPHOs to effectively communicate the shelter-at-home orders with the community?
2. Does unified command play a role in an LPHOs' risk communication and the community's risk perception during a pandemic?

Research Design

The researcher approached this dissertation as a multiple-case study of local risk management processes used in three South Texas counties of Cameron, Hidalgo, and Nueces during the recent COVID-19 pandemic. According to Yin (1994), "Case studies are the preferred strategy when 'how' and 'why' questions are being posed, when the investigator has little control over events, and when the focus is on a contemporary phenomenon within some real-life contexts" (p. 1). Crowe et al. (2011) suggested that case studies can be used as single-case or multiple-case research approaches, which can offer a deeper understanding of crucial elements that can be used to establish or verify theories that explain observed phenomena. The multicase study method allowed the researcher to evaluate the social network phenomenon influencing the community's risk perception of COVID-19 through a social media platform. According to Creswell (2013), "The case study method explores a real-life, contemporary bounded system (a case) or multiple bounded systems (cases) over time, through detailed, in-depth data collection involving multiple sources of information and reports a case description and case themes" (p. 97). According to Yin (2003), multiple case studies allow researchers to analyze data within and across situations whereas single case studies do not. Hyett et al. (2014) suggested that multicase studies can incorporate quantitative and qualitative evidence

because they use a comprehensive range of systematic methods, such as data collection, analysis, and reporting results.

This study included an interactive mixed methods research approach to allow qualitative and quantitative data to be examined during the shelter-at-home orders to determine the overall risk communication effectiveness and impact on the community's risk perception. Schoonenboom and Johnson (2017) mentioned that the interactive mixed methods research approach is also known as the equal-status mixed methods research because the researcher values both types of data equally and independently. Using the mixed methods approach, the researcher used quantitative and qualitative data to determine the impact of the local PHEMnet and the most influential risk communication methods used to influence the community's overall COVID-19 pandemic risk perception. According to Schoonenboom and Johnson, "The overall goal of mixed methods research, combining qualitative and quantitative research components, is to expand and strengthen a study's conclusions and, therefore, contribute to the published literature" (p. 110).

The study conducted a content analysis of specific Facebook messages using a qualitative data analysis method known as sentiment analysis (SA). In addition, qualitative analysis involved the study of information patterns observed on Facebook between the users and the local PHEMnets. Creswell (2014) stated, "Qualitative research is an approach for exploring and understanding the meaning individuals or groups ascribe to a social or human problem" (p. 4). The mixed methods approach was a convergent parallel design because "quantitative and qualitative strands of research are performed independently, and their results are brought together in the overall interpretation" (Schoonenboom & Johnson, 2017, p. 117). Therefore, the researcher evaluated

qualitative and quantitative data to measure different research variables and the effectiveness of local risk communication activities and identified best practices to increase community resiliency for COVID-19 and future public health emergencies. The mixed methods approach provided a more comprehensive understanding of the policy being studied and its community impact. Creswell (2013) further emphasized that this research approach also helps to address potential limitations or biases of either qualitative or quantitative methods being used alone.

Content Analysis of Shelter-at-Home Orders

The content analysis examines and evaluates government policies, programs, and decisions to improve their effectiveness, outcomes, and social impact. It comprehensively examines the policy context, design, implementation, and outcomes and often draws on various methods and data sources. Content analysis is a systematic and comprehensive research approach used to examine the content of written or verbal communication (Neuendorf, 2016). The method involves coding and categorizing the content data to detect patterns, themes, and trends (Krippendorff, 2013). By allowing for data comparison over time, content analysis helps assess the impact and effectiveness of policies on society (Creswell, 2014). In emergency management, content analysis plays a crucial role in evaluating the importance and effectiveness of policies. Therefore, this study used content analysis to help identify areas for improvement and guide policy development for current and future public health emergencies.

Content analysis of local shelter-at-home orders during the COVID-19 pandemic involved evaluating the community mitigation measures and reviewing the involved emergency management actors. These orders were implemented throughout the United

States during the pandemic and waves of increased cases in certain areas. The design of these policies required various restrictions toward nonessential businesses and social gatherings and the legal law enforcement capability of fining or incarcerating individuals who did not abide by the order. The researcher used the policy analysis approach to determine whether the LPHOs used a unified command system during the shelter-at-home orders to implement these emergency mandates. Therefore, the content analysis allowed the researcher to identify the unified command methods used in each jurisdiction by examining the policy context, design, implementation, and outcomes of the shelter-at-home orders issued in these jurisdictions.

Sentiment Analysis of Facebook

SA aimed to analyze the Facebook posts and comments to evaluate the effectiveness of the mandates and the overall influence of the community's risk perception. Facebook allows social media users to follow individuals and organizations they deem essential in certain aspects of their lives. Moreover, this study measured the collaboration among the LPHOs in the three South Texas jurisdictions to promote a multisector commitment toward communicating similar messages and reaching a larger audience. Ansell and Gash (2008) stated that collaborative governance must agree on the problem and how to address it appropriately to avoid duplicated efforts at best and contradictory at worst. If misalignments exist between various influential community organizations, citizens will be less likely to trust the LPHO and adhere to safety measures and preventative practices.

According to Pantic et al. (2012), emotions play a crucial role in analyzing an event to assess the relationship quality between local officials and stakeholders.

Therefore, it is essential to consider feelings to determine whether a relationship is successful and effective. This study aimed to quantify Facebook reactions through a binary value based on positive and negative reactions. Cambria et al. (2017) claimed that sentiment classification is an agreement detection, giving a pair of affective inputs and deciding whether they should receive the same or differing sentiment-related labels. Complementary to sentiment classification is the assignment of degrees of positivity to the detected polarity to the inferred emotions of all involved parties. Quantifying qualitative data can enhance decision making for LPHOs in times of public health emergencies and contribute to the existing literature (Charmaz, 2014). Therefore, this study included values for each sentiment classification: 5 (*positive*), 4 (*slightly positive*), 3 (*neutral*), 2 (*slightly negative*), 1 (*negative*), and 0 (*no sentiment*).

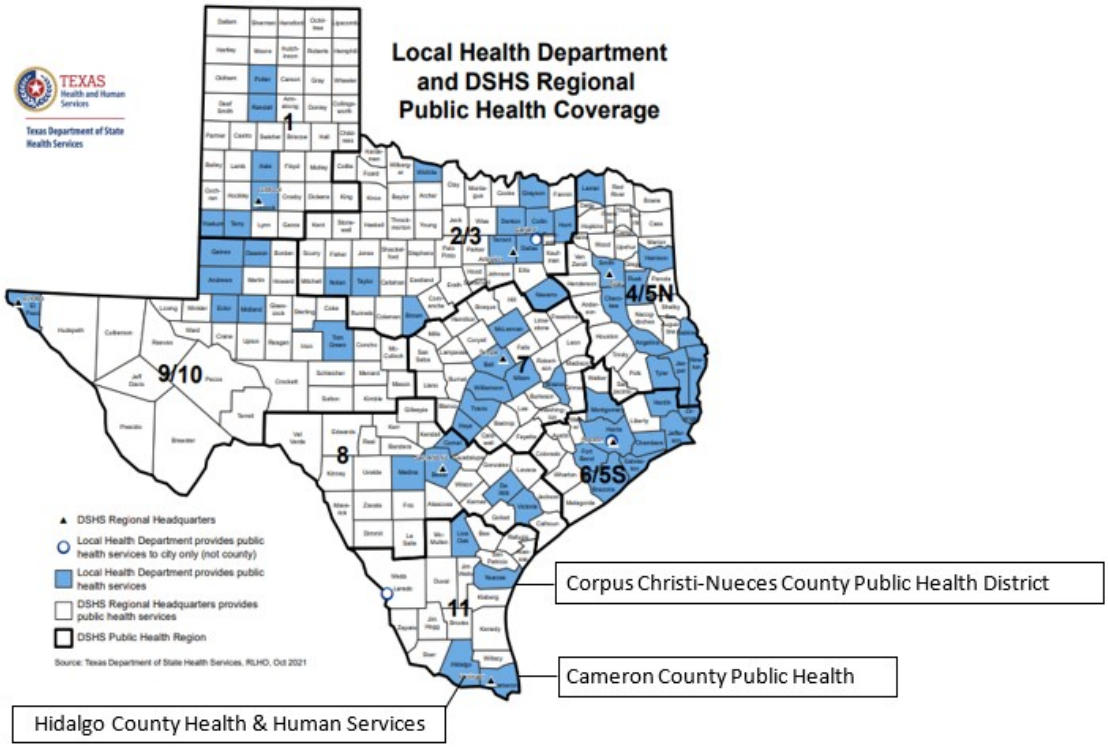
PHEMnet is a theoretical model referenced throughout this study as the local risk management process used to mandate the orders and publish risk communication messages on Facebook. This network is modeled after FEMA's (2017) National Incident Management System (NIMS) and the CDC's Critical and Emergency Risk Communication literature and best practices. The researcher identified the central organization in the PHEMnet theoretical model as the LPHO because of the diverse partnerships needed to ensure practical risk communication activities are conducted to inform citizens during an emergency. This study reviewed collaborative governance efforts between LPHO agencies and other local jurisdictions to ensure that risk communication activities are effective.

Population and Sample

This dissertation is a multiple-case study that aimed to analyze three South Texas LPHOs' risk communication activities on Facebook during the shelter-at-home orders at the beginning of the COVID-19 pandemic. The population included in this study was verified Facebook account users who publicly reacted to posts related to the pandemic in the jurisdictions being observed. The three counties selected for this study were Cameron, Hidalgo, and Nueces, the largest counties in the Texas DSHS Region 11 (see Figure 2).

Figure 2

Texas Department of State Health Services (DSHS) Region Map



Note. From "Public Health Regions [View: Map]," by Texas Department of State Health Services, 2021 (https://www.dshs.texas.gov/sites/default/files/regions/Texas-Local-and-Regional-Public-Health-Coverage-Map.pdf).

These LPHOs serve the entire county and are identified as having metropolitan-statistical areas. The sample size of a study using Facebook is an essential factor to consider because of the characteristics of the population being studied. Pannucci and Wilkins (2010) asserted that selecting an adequate sample size is critical to guarantee the validity and reliability of study outcomes. Therefore, when conducting a study on Facebook usage, it is vital to consider the characteristics of the population included in the research. For example, if the population is homogeneous and the study is focused on a specific aspect of Facebook usage, a smaller sample size may be sufficient.

However, Cohen (1988) emphasized that if the population is heterogeneous and the study aims to generalize the results to a larger population, a larger sample size may be necessary. Wong-Parodi and Feygina (2021) stated that risk communication messages published on social media increase the local emergency management capacity by establishing situational control and influencing the perception of risk among citizens. Public officials can mass communicate critical messages to their local community by working with influential individuals on social networks. Adiyoso (2022) observed that emergency response effectiveness depends on the interactions, communication, and interplay between members during a catastrophic event.

Instrumentation

This study focused on the risk communication activities conducted by LPHOs via Facebook posts. It analyzed the community's risk perception by gathering each jurisdiction's shelter-at-home orders, related Facebook posts, and comments on the mandates of the LPHOs being studied. Information used in this research was publicly available on the LPHOs' websites and official Facebook accounts. The researcher did not

use a survey or interview instrument because this was a historical multicase study of a global pandemic using quantitative and qualitative data gathered from the shelter-at-home orders and Facebook SA of the related posts and comments.

Data Collection

This study aimed to assess the impact of local risk management processes by analyzing the policies of the shelter-at-home orders and the LPHOs' risk communication activities on Facebook. Comfort et al. (2004) emphasized that during natural disasters, the public gauges the effectiveness of the operational response by the timeliness and quantity of pertinent information disseminated by the emergency response authorities. A significant factor that was considered to determine the effectiveness of the local risk management process was to review the unified command approach used in each jurisdiction by evaluating the orders and Facebook risk communication activities. According to previous research, the success of emergency response organizations, such as LPHOs, relies on effective leadership and communication strategies that establish a unified command and influences community risk perception during pandemics. The PHEMnet model was determined for LPHOs to evaluate their risk management process and influence on the community's risk perception.

Protecting Human Subjects

Ethics and confidentiality were significant components during the data collection process. To maintain confidentiality, the only Facebook accounts identified in this study included the four main accounts the LPHOs used to release critical COVID-19 pandemic messages to the community served. By not identifying human subjects and using secondary research sources, the researcher did not need to require consent from Facebook

account users as per Category 4: Secondary Research for Which Consent is Not Required 45 CFR 46.10(d)(4):

1. Use of publicly available identifiable private information or identifiable biospecimen.
2. Information is recorded by the investigator in such a way that the identity of the subjects cannot be readily ascertained, and the investigator will neither contact the subjects nor re-identify subjects. (U.S. Department of Health and Human Services [HHS], 2018, para. d3)

Data Analysis

The data used for this study include qualitative and quantitative findings. The study included two forms of data analysis to evaluate the different LPHOs' risk management processes: (a) content analysis and (b) SA. The content analysis reviewed the shelter-at-home orders to analyze the local mandates and identify the risk management process used during the COVID-19 pandemic. The content analysis primarily focused on the wording of the orders to analyze the language techniques used to determine the presence and frequency of specific themes, topics, and ideas (Krippendorff, 2004). The content analysis of each shelter-at-home order required the researcher to gather insights into the policy's goals, values, and perspectives that affect the community (Neuendorf, 2016). Content analysis is a valuable research tool to determine the collaborative governance in responding to the pandemic between the LPHOs for each jurisdiction (Ostrom, 2010). This analysis involves identifying critical stakeholders involved in the policy-making process, reviewing the decision-making process, evaluating the effectiveness of the policies, and assessing the communication and

feedback from the public (Heikkila & Gerlak, 2005). Kabir (2016) emphasized that an adequate balance must be found between how much data should be collected versus how much resources can be used in terms of time, effort, and funds. A second limitation of a multiple-case study is that the researcher may need help conveying or describing the findings. This analysis allows the researcher to analyze Facebook's local collaborative governance and risk communication activities. The second type of analysis used in this study was SA. The researcher analyzed the sentiments of the LPHOs and the community members actively participating in Facebook. SA analyzes written or spoken language's tone, emotion, and attitude that the Facebook platform can capture. This study used Facebook SA to determine the public's opinion about a specific topic or issue by analyzing the content of Facebook posts. Facebook SA provides valuable insights into the public's opinion and can inform decision making by organizations and policy makers.

Summary

This study used a multiple-case approach to compare the risk management processes employed by the three South Texas jurisdictions of Cameron, Hidalgo, and Nueces. A content analysis was used to analyze the local orders to evaluate their emergency response efforts for an effective risk management process during the COVID-19 pandemic and for future public health events. In addition, the Facebook SA gave the researcher access to the posts and comments analyzed to assess a strong or weak relationship between the LPHO and its community. The multicase research method's limitations included extensive data collection and time to complete the study. The data findings produced the necessary results to determine whether collaborative governance and risk communication activities are more effective under a unified command approach

and how that impacted the overall community's risk perception toward the shelter-at-home orders during the COVID-19 pandemic.

CHAPTER 4: RESEARCH, DATA COLLECTION, AND FINDING

This chapter presents the data collected from the local shelter-at-home orders' content analysis and sentiment analysis (SA) of Facebook accounts used by local public health officials (LPHOs) to communicate the local government mandates to the three South Texas counties of Cameron, Hidalgo, and Nueces. The researcher used two different forms of analyses, content and sentiment, to conduct a comprehensive study on the LPHOs' risk management process and to evaluate the phenomenon of social media platforms used as a risk communication tool. The content analysis evaluated the three South Texas local shelter-at-home orders, and the Facebook SA was conducted to determine the impact of the LPHOs' social media messages regarding the mandates and the comments made by the community to evaluate its risk perception and feelings toward these orders. Content analysis studies are written, spoken, or visual communication materials. This type of analysis is a systematic approach that involves coding and categorizing the content data to identify patterns, themes, and trends in the data (Krippendorff, 2013).

In addition, content analysis allows for comparing data over time, helping to evaluate the effectiveness of policies and their impact on society (Creswell, 2014). These findings aim to help public health decision makers understand the orders' impact on public health and the economy. This study used content analysis to evaluate the LPHOs' implementation of the orders during the COVID-19 pandemic's shelter-at-home orders. Content analysis is a research method used to analyze and understand text meanings, themes, and patterns (Krippendorff, 2013). In policy research, content analysis analyzes policy documents, speeches, and media coverage to determine how policy issues are

framed and communicated (Birkland, 2015). For example, a content analysis of media coverage of climate change policy could reveal the dominant frames and themes present in news coverage and how policy issues are presented to the public.

SA is a widely used technique in social media analysis for various domains to help understand the context and opinions expressed in a body of text (Baeza-Yates & Ribeiro-Neto, 2011; Pang & Lee, 2008). One key aspect of SA is polarity, which assigns numerical values to positive and negative sentiments to quantify the qualitative results (Hu & Liu, 2004). The overall sentiment of the text can then be *positive*, *slightly positive*, *neutral*, *slightly negative*, *negative*, or *no sentiment* based on the calculated sentiment value. Polarity values in SA monitor and track public opinion about a topic, event, or person in real time. From Liu et al.'s (2012) research, SA has gained significant importance in the field of natural language processing because of its ability to identify and extract subjective information from text data. The researcher suggested that this approach can be used to understand customers' sentiments and to improve business decisions. SA is most effective when applied to text with a subjective context, such as text that expresses human emotions, feelings, and moods rather than text with only an objective context (Ravi & Durvasula, 2016). A high polarity value in SA suggests a strong positive or negative sentiment expressed in the text (Bengio et al., 2003). This researcher recognized that high polarity values express negative opinions and emotions toward the local public health organizations' risk communication activities regarding the orders (Kim & Zhong, 2020). In contrast, the low polarity value suggests that the community positively views the government and its emergency management activities.

In analyzing text related to the relationship between a community and a government, a high polarity value would suggest a strong positive or negative opinion about the government or the community's relationship with the government. Therefore, the local public health officials' posts were analyzed to assess the sentiments between their posts and the public's comments. Bandhakavi et al. (2017) expressed that polarity can be effectively quantified through the computational study of language. By doing that, the researcher assessed the sentiment's polarity by subtracting the SA values of the LPHOs post and the overall average of the public comments. The researcher hypothesized that lower polarity values demonstrate effective risk communication activity because the community's sentiment is similar to their LPHOs, showing no contradicting sentiment between post and comment contributors.

Purpose of the Study

The purpose of this study was to evaluate the risk management processes used by the LPHOs to suggest the most effective approaches during the COVID-19 pandemic shelter-at-home orders. Gatewood et al. (2020) suggested Facebook provides the government with an educational outreach tool to effectively reach a large audience and disseminate risk information during an emergency. Using the Facebook platform can lead to improved communication and understanding between the LPHO and the public to encourage transparency, legitimacy, and trust (Oh et al., 2015). Facebook provided LPHOs with the opportunity and accessibility to communicate directly with the community to answer questions, receive feedback, and understand the public's needs and concerns during the shelter-at-home orders and the entire pandemic. Public officials and administrators would need to have an active presence on social media platforms so that

public trust during an emergency is high among the citizens, potentially yielding more behaviorally preventive activities toward the pandemic and following the LPHOs emergency management activities. This multiple-case study aimed to evaluate the public health emergency management network (PHEMnet) used during the COVID-19 risk management process at the local level. This study allowed the researcher to determine whether risk communication activities influenced the community's risk perception toward the necessity of having and abiding by the local shelter-at-home orders implemented by their LPHO.

Research Questions

This study included two research questions. The design of the research questions determined whether LPHOs used collaborative governance and effective risk communication activities on Facebook to influence the community's risk perception during the COVID-19 pandemic shelter-at-home orders.

1. What was the most effective PHEMnet used by the LPHOs to effectively communicate the shelter-at-home orders with the community?
2. Does unified command play a role in an LPHOs' risk communication and the community's risk perception during a pandemic?

Research Methods and Data Collection Procedures

The use of multiple-case studies and mixed methods approach in research provides various benefits for understanding complex phenomena comprehensively. These approaches are increasingly popular in the social sciences, allowing researchers to triangulate data from different sources and explore issues from multiple perspectives (Creswell, 2013). Multiple-case studies provide the researcher the ability to increase the

generalizability of the findings by comparing similar cases across different contexts (Yin, 2014). This research approach allows researchers to identify patterns and similarities that might not have been evident if they had only focused on a single case. Furthermore, by examining multiple cases, researchers can identify the unique factors contributing to a particular outcome, which can be used to develop more effective interventions or solutions (Stake, 1995).

This study analyzed multiple cases using the mixed methods approach to integrate qualitative and quantitative methods to understand the research questions (Creswell & Clark, 2018). By combining qualitative and quantitative methods, the mixed methods approach provides the benefits of both approaches and overcomes their limitations (Creswell & Clark, 2018). For example, qualitative methods provide rich, in-depth data and allow for exploring complex phenomena, and quantitative methods generalize the findings to a larger population (Creswell & Clark, 2018). This study approach is beneficial because researchers can increase the generalizability of their findings, identify unique factors that contribute to an outcome, and gain more understanding of the research problem.

Content Analysis of Shelter-at-Home Orders and Amendments

Conducting a content analysis of local risk management processes during the COVID-19 pandemic shelter-at-home orders can provide valuable insights into these processes' strengths and weaknesses and help improve them. The pandemic brought about many challenges, and local authorities had to adapt quickly to the changing circumstances. Content analysis can help understand how well they have done this and what can be done to improve their risk management processes in the future. The shelter-

at-home orders required federal, state, and local government and public health authorities to quickly adapt to changing circumstances and implement effective risk management processes. The study found that some local authorities were more successful in managing the risks associated with the pandemic than others and that the reasons for this were related to the effectiveness of their risk management processes.

In addition, doing a content analysis of local risk management processes that involve a policy provided the researcher with further insight into the impact of the shelter-at-home orders in the different communities and assisted in identifying the best forms of public administration practices during a pandemic or other emergencies. Fenxia (2022) found that communities with effective risk management processes were better able to cope with the pandemic's challenges and experienced fewer adverse effects than those with less effective risk management processes. Moreover, the study found that local authorities with adequate risk management processes before the pandemic were better equipped to manage the risks associated with shelter-at-home orders (Fenxia, 2022). Conducting the content analysis of the local risk management process during the COVID-19 pandemic shelter-at-home orders provided the researcher with valuable insights into the effectiveness of the orders and the local response to the pandemic. Based on the study findings, there is a need to strengthen the PHEMnet of certain local public health organizations. During the timeframe analyzed, Nueces County, which includes Corpus Christi, had the least effective risk management process.

Facebook Sentiment Analysis

SA was conducted for the LPHOs' posts and public comments published on Facebook to assess the effectiveness of the LPHOs' risk management process and

evaluate the community perception of the local shelter-at-home orders and amendments. The researcher focused on studying Facebook because it was the social media platform that each jurisdiction consistently used to communicate with the public during the COVID-19 pandemic. The researcher gathered the Facebook data by accessing each LPHOs' public Facebook account and copying and pasting their posts and public comments into a Microsoft Excel worksheet created for each jurisdiction. The Excel worksheets were then uploaded into MaxQDA to run the SA. MaxQDA uses a lexicon to evaluate sentiments, which contains a sentiment score for each word in the lexicon. Sentiment values produce negative results for words with negative connotations, close to zero for neutral words, and positive for words with positive connotations. For this study, the researcher assigned a numerical value to each MaxQDA sentiment category to provide quantitative data demonstrating the polarity between the LPHO and the community (see Table 2).

Table 2

MaxQDA Sentiment Categories and Assigned Numerical Values

Sentiment	Positive	Slightly positive	Neutral	Slightly negative	Negative	No sentiment
Value	5	4	3	2	1	0

According to a study by WHO (2020a), neutral sentiment values are the most effective in conveying COVID-19 risk messages. Neutral messaging, which focuses on providing accurate and objective information without invoking strong emotions, has increased the likelihood of the audience taking recommended preventive actions. In contrast, messages that evoke strong emotions, such as fear or hope, have been found to have a limited

impact on behavior change (WHO, 2020a). WHO supported this study's finding by further emphasizing the importance of effective communication in the fight against the COVID-19 pandemic and encouraged using neutral sentiment values in all pandemic risk messages.

Description of the Sample

For this study, the researcher analyzed the most relevant LPHOs' Facebook accounts for the following three South Texas counties: Cameron, Hidalgo, and Nueces. Table 3 provides the LPHOs' government types and Facebook accounts used in this study.

Table 3

South Texas Jurisdictions' LPHOs' Facebook Accounts

Jurisdiction	LPHO	LPHO government type	Facebook account (research reference)
Cameron County	Cameron County Public Health Department	Cameron County public health agency	Cameron County public health
	City of Brownsville	Municipal government	City of Brownsville
Hidalgo County	Hidalgo County	County government	Hidalgo County
Nueces County	Nueces County	County government	Nueces County
	City of Corpus Christi	Municipal government	City of Corpus Christi

Note. LPHO = local public health organization.

These jurisdictions consisted of county and city LPHOs that used different unified command approaches to issue the orders and communicate the COVID-19 pandemic risks on Facebook. Therefore, the only social media accounts focused in this study belonged to the county and city governments and respective public health agencies that

possess the jurisdictional legal authority to issue shelter-at-home orders and are primarily responsible for communicating these mandates to their community. Furthermore, the community's sample size was determined from the public comments featured in these posts to conduct the study's SA.

Jurisdictional Data Findings

This section provides the data findings from the LPHOs' shelter-at-home orders policy content analysis and risk communication activities on Facebook during the COVID-19 pandemic shelter-at-home orders for the counties of Cameron, Hidalgo, and Nueces. The researcher identified the risk management process used in each jurisdiction based on the language included in the orders and through assessing the local mandates' risk communication activities on Facebook. Content and SA were two research techniques used for this study to evaluate the local risk management process and to provide insights into the effectiveness of policies and identify gaps and overlaps. Content analysis of the local order is imperative to understand the jurisdictions' collaborative governance efforts during the pandemic and identify areas that can be modified to achieve the desired outcomes. The content analysis uses a qualitative approach whereas the Facebook SA uses qualitative and quantitative techniques to measure the LPHOs' risk communication effectiveness and the community's risk perception.

SA of the Facebook posts and comments was used to quantify the relationship between the LPHOs and the community being served. A polarity value was determined by the difference of sums between the average SA values of the LPHOs' posts and citizen comments. The polarity value of each jurisdiction allowed the researcher to gather insight into the most influential PHEMnets and risk communication activities for each

jurisdiction studied. In addition, the researcher identified two themes for each post to categorize the type of communication method used by the LPHOs: directive and informative. These themes are presented in the data tables and graphs for each jurisdiction and further discussed to demonstrate the importance of risk communication message content during public health emergencies.

Cameron County Jurisdiction

Content Analysis: Cameron County Shelter-at-Home Order

Cameron County is located in Southern Texas and had a reported 2020 population of 421,017 (U.S. Census Bureau, 2021a). Cameron County issued one locally mandated shelter-at-home order policy passed by the county judge on March 23, 2020, effective March 25, 2020. The local public health officials involved in the risk management process of the study's period are listed in Table 4.

Table 4

Cameron County Local Public Health Officials

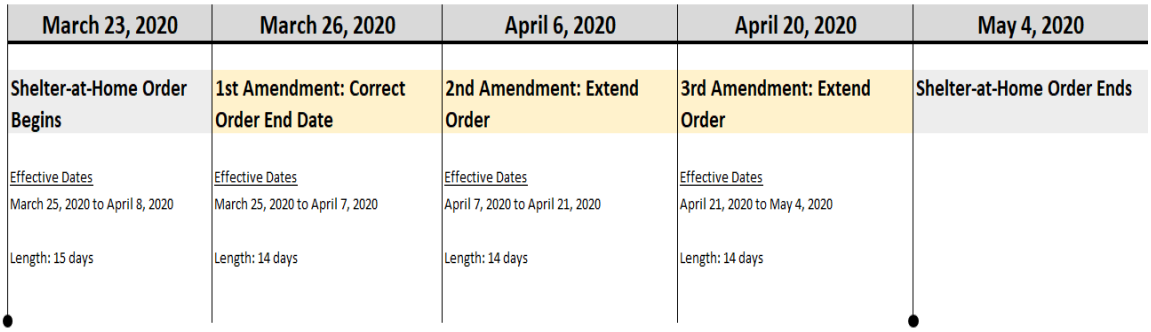
Title	Local public health official
County Judge	Eddie Trevino, Jr.
Cameron County Public Health, Health Administrator	Esmeralda Guajardo
Mayor, City of Brownsville	Juan Trey Mendez, III
Public Health Director, City of Brownsville	Dr. Arturo Rodriguez

Through the content analysis of the policy, the researcher identified the jurisdiction of Cameron County as using a multijurisdictional, unified command approach based on the LPHO's collaboration with the City of Brownsville (CoB) during risk communication activities. This order was initially supposed to end on April 7, 2020, lasting only 14 days;

however, the county further extended this order twice on the dates of April 6, 2020, and April 21, 2020, and May 4, 2020, as being the official end to the order (Figure 3).

Figure 3

Timeline of Cameron County Shelter-at Home Order



Each order extension included an additional 14 days of the shelter-at-home mandate causing the order to be in effect for 42 days. The two amendments issued by the county judge also included curfews and penalties that would take place if the order was not followed. This order and its two extensions included the same penalties throughout the 42 days if any condition were to be violated by a citizen:

> Violation of this order constitutes an imminent threat to the public health. The Sheriff, Constables, all Chiefs of Police in the County, and command staff of state law enforcement agencies operating in the County are hereby requested to assist to ensure compliance with and enforce this order.
>
> It is an offense to violate a condition or restriction of any Order issued by Cameron County Judge Eddie Trevino Jr., during the public health crisis/disaster. Said offense should be punished by a fine not to exceed $1,000 or confinement in jail for a term not to exceed 180 days if it is shown on the trial that the person has

been previously convicted one time of an offense under this section. (Cameron County, 2020, p. 9)

Sentiment Analysis: Cameron County Public Health

Cameron County Public Health (CCPH) published eight Facebook posts to inform the community of the shelter-at-home orders. CCPH is the local public health agency of Cameron County and had very low to no community participation in these specific risk communication activities on Facebook during the research period. The first post included the seven-page shelter-at-home order and a screenshot of each page per post; the screenshots included the English and Spanish versions of the order. The posts were identified as having a directive communication method because of the posts' lack of other information that would assist the public in understanding the current state of emergency. Table 5 provides the SA value for the posts made by CCPH and corresponding average comment SA values.

Table 5

Cameron County Public Health (CCPH): Sentiment and Polarity Values

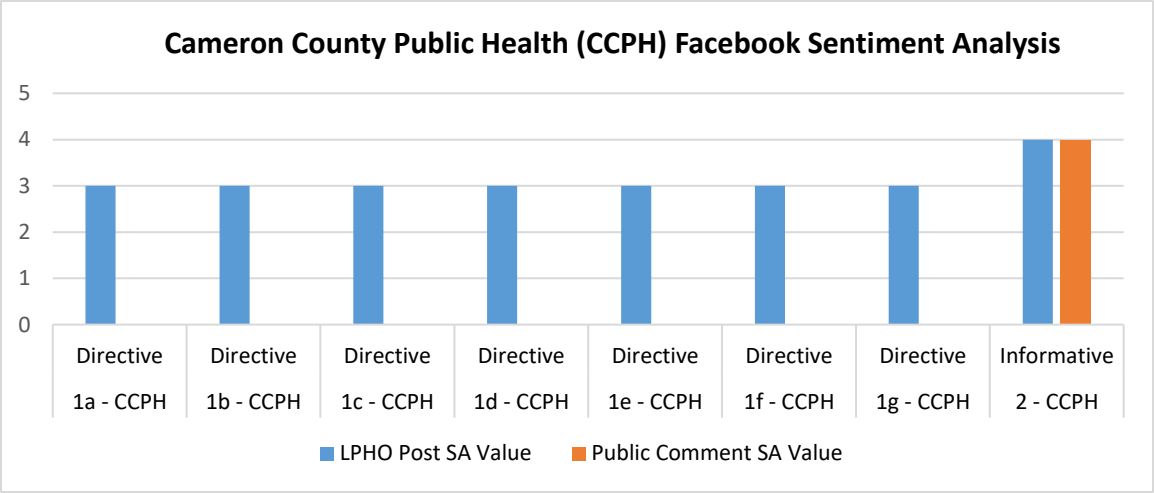
Post date	Post ID	Theme	LPHO post-SA value	Public comment SA value
3/24/2020	1a - CCPH	Directive	3	0
	1b - CCPH	Directive	3	0
	1c - CCPH	Directive	3	0
	1d - CCPH	Directive	3	0
	1e - CCPH	Directive	3	0
	1f - CCPH	Directive	3	0
	1g - CCPH	Directive	3	0
3/26/2020	2 - CCPH	Informative	4	4
Average total SA values			3.1	0.5
Community polarity value				2.6

Note. LPHO = local public health organization; SA = sentiment analysis.

The average SA value for the posts was 3.1 whereas the average comment SA value was 0.5. The final post had the highest community participation and was identified as using an informative communication method because it provided the community with contact information to call centers ready to address questions on the coronavirus and the order (Figure 4). Overall, CCPH did not have effective risk communication with the community.

Figure 4

Cameron County Public Health (CCPH) Facebook Sentiment Analysis



Note. LPHO = local public health organization; SA = sentiment analysis.

Sentiment Analysis: City of Brownsville

CoB published six Facebook posts related to the shelter-at-home orders that Cameron County was issuing. CoB has a more significant following than Cameron County Public Health Department with 31,000 Facebook followers, allowing them to have a more extensive outreach when communicating with the public. Moreover, the community remained engaged with CoB during these emergency response activities of

communicating the local shelter-at-home order and amendments with the public. CoB and Cameron County modified their risk management process and aligned risk communication activity by using the CoB's Facebook account to inform the community of the shelter-at-home orders and other COVID-19 pandemic information. The values represented in Table 6 and Figure 5 demonstrate the Facebook SA data for CoB based on the officials' posts and public comments. CoB published six Facebook posts to communicate the shelter-at-home order and its two subsequent extensions. CoB communicated with citizens more frequently than CCPH throughout the shelter-at-home order.

Table 6

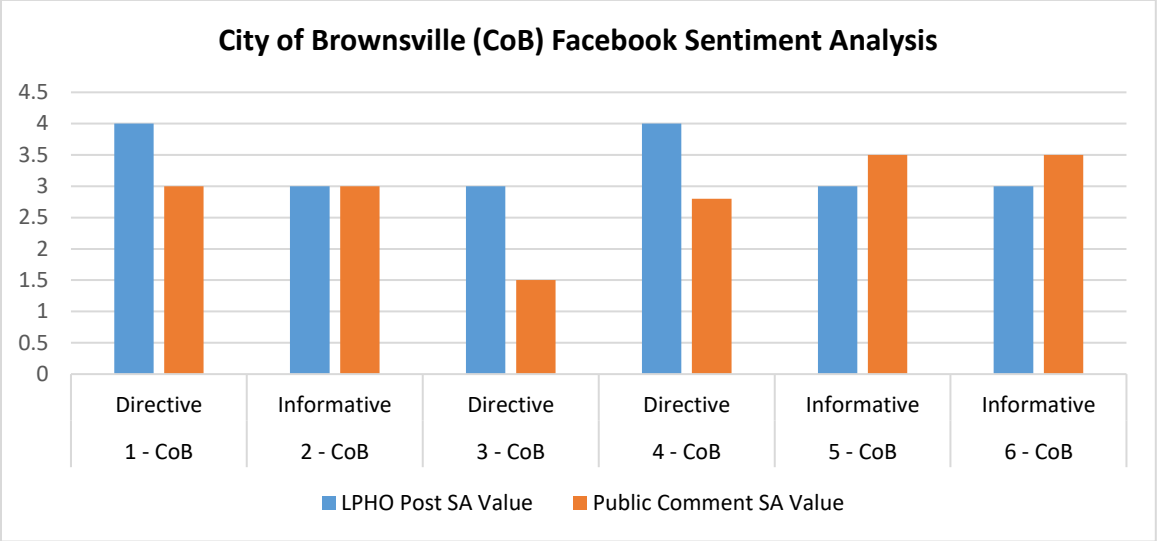
City of Brownsville (CoB): Sentiment and Polarity Values

Post date	Post ID	Theme	LPHO post-SA value	Public comment SA value
3/23/2020	1 - CoB	Directive	4	3
3/24/2020	2 - CoB	Informative	3	3
3/25/2020	3 - CoB	Directive	3	1.5
3/26/2020	4 - CoB	Directive	4	2.8
4/6/2020	5 - CoB	Informative	3	3.5
4/17/2020	6 - CoB	Informative	3	3.5
Average total SA values			3.3	2.9
Community polarity value				0.40

Note. LPHO = local public health organization; SA = sentiment analysis.

Figure 5

City of Brownsville's (CoB) Facebook Sentiment Analysis



Note. LPHO = local public health organization; SA = sentiment analysis.

The average sentiment of the LPHO and the community was the most similar when the LPHO used the informative communication method. The last two posts were determined to have an informative communication approach because they informed their citizens on how to get more information from the Cameron County Public Health Department 24 hr a day regarding the COVID-19 pandemic and the last order extension. Furthermore, the last post included an early announcement regarding the county judge extending the order until May 4, 2020.

Hidalgo County Jurisdiction

Content Analysis: Hidalgo County Shelter-at-Home Orders

Hidalgo County is another jurisdiction located along the Texas–Mexico border with an overall population of 880,356 (U.S. Census Bureau, 2021b). During the first 6 months of the COVID-19 pandemic, the Hidalgo County judge mandated two local shelter-at-home orders because of the high infection rates experienced in Hidalgo County

(Figure 6). The local orders demonstrated a multiagency unified command approach consisting of the county judge's office and the Hidalgo County Health and Human Services Department (Table 7).

Figure 6

Timelines of Hidalgo County Shelter-at Home Orders

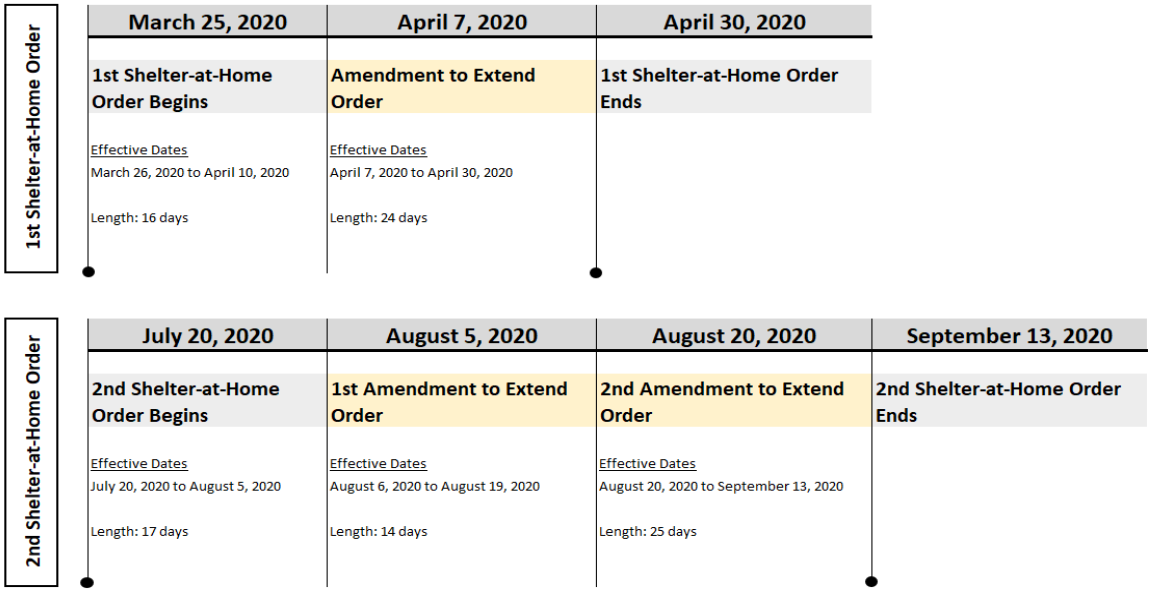


Table 6

Hidalgo County Local Public Health Officials

Title	Local public health official
County Judge	Richard Cortez
Hidalgo County Health & Human Services, Chief Administrative Officer	Eduardo Olivarez
Hidalgo County, Chief Medical Authority	Dr. Ivan Melendez

The first order was issued on March 25, 2020, and included two amendments extending the order from April 7, 2020 to April 30, 2020. The first order lasted a total of 40 days. The first order only included penalties once the 1st Amendment was executed.

Moreover, the order exercised its police authority to allow all law enforcement officers to enforce the shelter-at-home mandate:

> Any peace officer or other person with lawful authority, including but not limited to the Hidalgo County Sheriff's Office, the Hidalgo County Constable's Offices, the Hidalgo County Fire Marshal's Office, the Hidalgo County District Attorney Investigators, and all other law enforcement partner agencies are hereby authorized to enforce the provisions of this Order in accordance with the authority granted under Chapter 418 of the Texas Government Code. (The County of Hidalgo, 2020a, p. 11)

On July 20, 2020, the second shelter-at-home order was initially imposed. However, it was amended twice, extending its duration until August 29 and September 13, respectively, creating a total of 56 days (the first extension occurred on August 6 and the second on August 20). The second shelter-at-home order included less excessive penalties of an issued warning for the first violation and a $250 fine for a second violation. Hidalgo County eased up on the penalties, including the prohibition of detainment, arrest, or confinement to jail by law enforcement officers for violating the order:

> In accordance with Governor Abbott's Executive Order GA-29, following a verbal or written warning for a first time violation of this face covering, a person's second violation shall be punishable by a fine not to exceed $250 per violation.
>
> In accordance with Governor Abbott's Executive Order FA-29, local law enforcement and local officials should enforce this order, as well as other local

> restrictions that are consistent with this Order and other Governor Abbott effective Executive Orders. No law enforcement or other official may detain, arrest, or confine in jail any person for a violation of this order, provided however that law enforcement may enforce trespassing laws and remove violators at the request of a business establishment or other property owner. (The County of Hidalgo, 2020b, p. 5)

Sentiment Analysis: Hidalgo County

The Hidalgo County used its Facebook account to communicate with the citizens about the COVID-19 pandemic, including the shelter-at-home orders and their amendments. The SA included six Facebook posts published by the county during both shelter-at-home orders in March and July of 2020 (Table 8 and Figure 7). Four Facebook posts were identified as having an informative communication method (theme).

Table 7

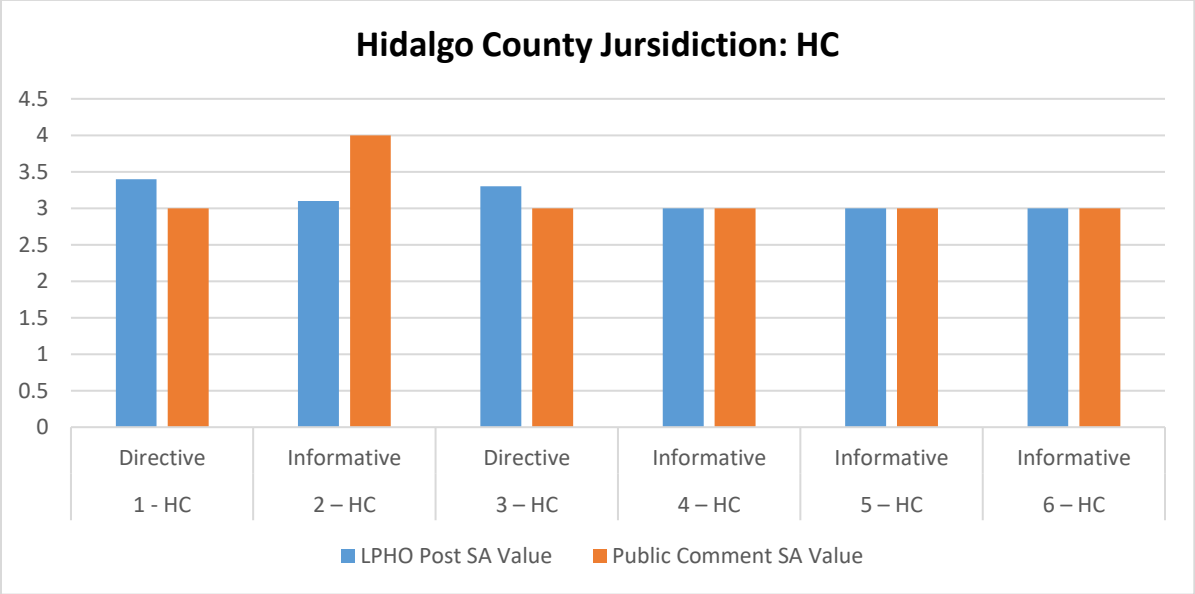
Hidalgo County (HC): Sentiment and Polarity Values

Post date	Post ID	Theme	Post-SA value	Average comment SA value
3/25/2020	1 – HC	Directive	3.4	3
3/25/2020	2 – HC	Informative	3.1	4
4/7/2020	3 – HC	Directive	3.3	3
7/19/2020	4 – HC	Informative	3	3
8/6//2020	5 – HC	Informative	3	3
8/19/2020	6 – HC	Informative	3	3
Average total SA values			3.13	3.16
Community polarity value				0.03

Note. SA = sentiment analysis.

Figure 7

Hidalgo County (HC) Facebook Sentiment Analysis



Note. LPHO = local public health organization; SA = sentiment analysis.

The informative posts provided current COVID-19 cases in Hidalgo County, relevant information on the shelter-at-home orders, and direct links to the orders and amendments whereas the directive posts only included the shelter-at-home order and no other type of additional information or hyperlinks. Hidalgo County had an active community response and the lowest polarity value at 0.03 of all the LPHOs evaluated in this study. The polarity value was the product of the average SA values for the posts at 3.13 and comments at 3.16.

Nueces County Jurisdiction

Content Analysis: Nueces County Shelter-at-Home Order

Nueces County is located along the coastal bend region of South Texas and has a population of 353,079 and 90% of the citizens residing in the City of Corpus Christi (CoCC). The LPHOs analyzed in this jurisdiction included Nueces County and the

CoCC. Each LPHO issued separate shelter-at-home orders and amendments during this study period, March 2020 through September 2020. Nueces County issued one shelter-at-home order with four amendments, and the CoCC issued one shelter-at-home order with two amendments. Similar penalties were included in both county and city orders in which individuals not complying with the mandates could be incarcerated and fined. The order stated,

> A violation of this Order to Stay At Home is a violation of the emergency management plans of Nueces County. A violation by any person of any provision of this Order to Stay At Home is punishable by a fine of up to $500 per violation and separate day of violation, and additional amount as authorized by law. A second offense after warning in which intent to commit all elements of an act prohibited herein is proven may result in a fine of up to $1,000 per violation or separate day of violation or up to 180 days in jail. (City of Corpus Christi [CoCC], 2020, p. 4)

During this time, the county and city had a local public health agency known as the Corpus Christi–Nueces County Public Health District (CCNCPHD) to serve the community's public health needs of CoCC residents and all other residents of Nueces County. A public health district consists of a county and city combined form of the health department to provide the most public health services to the local community (Local Public Health Reorganization Act, 1989). Table 9 provides the local public health officials, including county- and city-elected and appointed officials. During the COVID-19 pandemic, an interlocal agreement between Nueces County and the CoCC

existed in Nueces County that funded the public health district at 40% and 60% of funding from the city.

Moreover, this agreement required the director of public health to work with the county judge, city mayor, and city manager during regular operations and emergencies. Based on the timeline of these orders, CoCC issued its shelter-at-home order a day after Nueces County issued its shelter-at-home order; Figure 8 provides the timeline of the Nueces County order and amendments.

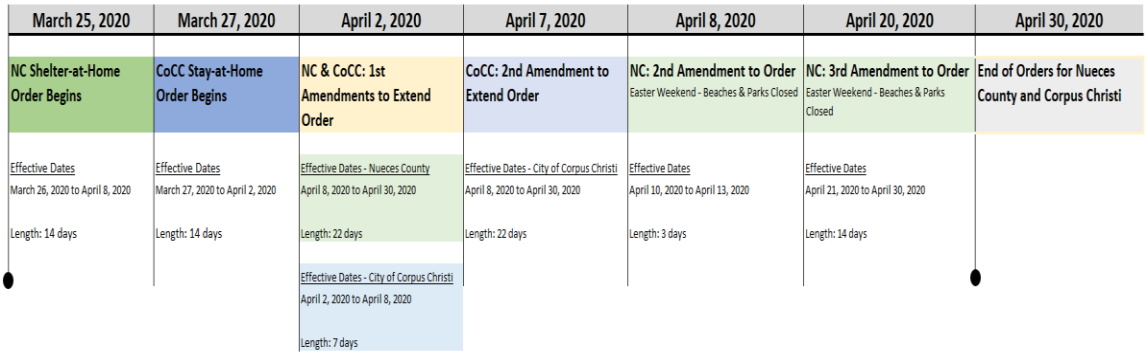
Table 8

Nueces County and City of Corpus Christi Local Public Health Officials

Title	Local public health official
County Judge	Barbara Canales
Mayor, City of Corpus Christi	Joe McComb
City Manager, City of Corpus Christi	Peter Zanoni
Director of Public Health, Corpus Christi–Nueces County Public Health District	Annette Rodriguez

Figure 8

Timeline of Nueces County Shelter-at-Home Order and City of Corpus Christi Stay-at-Home Order



The independent LPHOs' risk management processes demonstrated a significant need for both collaborative governance and risk communication activities by influential LPHOs. This can also be seen in the county's order when the judge stated that no other order issued by a city within Nueces County would supersede the county's order:

> This Order of County Judge Barbara Canales applies to all incorporated and unincorporated areas of Nueces County. To the extent of a conflict between decisions of Nueces County Judge Barbara Canales and a mayor of any city within the geographic boundaries of Nueces County, the decisions set forth in this Order prevail (to the fullest extent allowed by law pursuant to Texas Government Code Section 418.108(h). (CoCC, 2020a, p. 4)

Nueces County was the only LPHO that included this language in its order, demonstrating its legal authority in Texas for the county judge to be the lead emergency manager during a disaster. The COVID-19 pandemic revealed the importance of effective leadership in ensuring a coordinated and effective response to a crisis. However, local leaders have often failed to use a unified command because of a lack of leadership qualities. Leaders who work together during a public health emergency often need help to effectively coordinate and prioritize resources, leading to a fragmented and ineffective response to a crisis (Gostin, 2020). According to Northouse (2013), collaboration involves working with others to attain a shared objective. Leaders who lack collaboration skills may face challenges in effectively coordinating with external agencies and stakeholders, which may impede their ability to respond cohesively and efficiently. Local leaders who lack collaboration skills are also often unable to effectively use a unified command during a crisis.

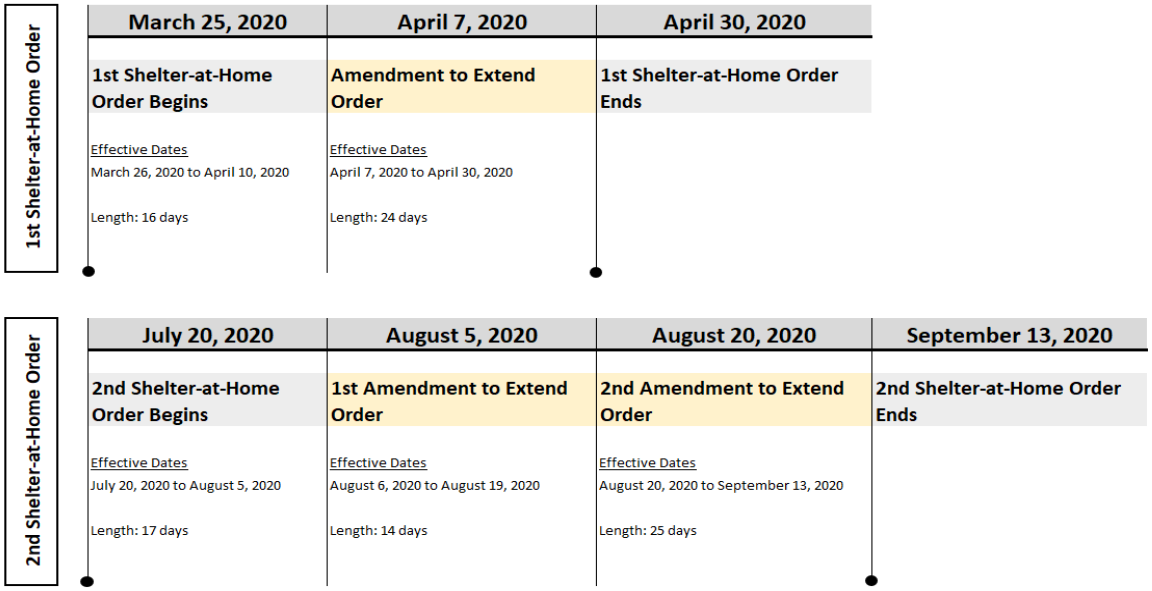
Content Analysis: City of Corpus Christi

The lack of leadership qualities among local leaders was a significant factor contributing to the failure to use a unified command during the COVID-19 pandemic. A lack of crisis management experience, emotional intelligence, and collaboration skills among local leaders hindered their ability to respond effectively to the crisis and protect public health and safety.

The CoCC issued a stay-at-home order 2 days after Nueces County by former City Mayor Joe McComb on March 27, 2020, and was intended to end 7 days after the order was issued on April 2, 2020. The first amendment was issued on March 31, 2020, to extend the order date until April 8, 2020, lasting another 7 days. The second and last amendment was issued a day before the order expired on April 7, 2020, until April 30, 2020 (Figure 6 repeated for ease of reference).

Figure 6

Timelines of Hidalgo County Shelter-at Home Orders



The researcher identified Nueces County and the CoCC using the internal agency command method rather than a multijurisdictional unified command approach as Cameron County and CoB. The order and amendments included penalties of fines and imprisonment for individuals that violated the order. The first amendment had the most penalties listed in the CoCC (2020b) order to stay at home:

> a. A violation of the Order to Stay at Home, Order to Report COVID-19, and other orders issued pursuant to this disaster is a violation of the emergency management plans of the City of Corpus Christi. A violation by any person of any provision of this Order to Stay at Home is punishable by a fine of up to $500 per violation or separate day of violation.
>
> b. Any person knowingly violating a provision of the Order to Stay at Home, Order to Report COVID-19, and other orders issued pursuant to this disaster after being warned that a specific act or omission would be a violation of the City's emergency management plan and being convicted of a first offense pursuant to subsection 4.a. may be punished by a fine of up to $1,000 per violation or separate day of violation or up to 180 days in jail.
>
> c. It shall be a defense to prosecution of a violation of an order issued pursuant to this disaster that a person was present in a gathering while exercising (1) First Amendment rights protected by the United States Constitution or (2) rights protected by Chapter 11 of the Texas Civil Practice and Remedies Code. (p. 3)

The content analysis of the two orders from Nueces County and the CoCC demonstrated that the local leaders in this jurisdiction lacked collaborative governance and effective risk communication efforts that resulted in a fragmented and ineffective risk

management process because of their inability to work with each other to protect the community during this period (Gostin, 2020). Northouse (2013) emphasized that collaboration is defined as the ability to work with others to achieve a common goal and is a critical skill that leaders need to coordinate and prioritize resources effectively, especially during emergency management. This inability to use a unified command approach contributes to failing to protect public health and safety within a community. Therefore, it is crucial for local leaders to possess the necessary leadership qualities such as collaboration skills to respond effectively to a public health emergency like the COVID-19 pandemic.

Sentiment Analysis: Nueces County

The Nueces County Facebook account had 2,100 followers and published five posts about the county's stay-at-home orders on or near the dates the orders were mandated. The county's first post related to the stay-at-home order was published 2 days after the order was mandated on March 25, 2020. The theme of this post was informative, and post sentiment was 4 (*slightly positive*). The first post had no comments made by the community; therefore, the post had a *no sentiment* value (0). In addition, this post received only four likes, and there was no other type of emotional reaction from the community. The second post was another informative post with a SA value of 3 and an average comment SA value of 0 because no comments were made and it had a total of four likes. The third post by Nueces County was identified as having an informative communication method because the county judge was providing updates on the amended stay-at-home order on a YouTube live media feed. The third post had a *slightly positive* (4) sentiment with the average comment sentiment of *neutral* (3). The third post

was the only message that received public comments with an average comment SA value of 3 (*neutral*). This particular post had an informative communication method approach because of its content announcing live coverage of the county judge announcing the amendment of the stay-at-home order. The fourth post was about the amendment of the shelter-at-home order's Easter weekend enhancement beginning April 10, 2020, through April 13, 2020 (Nueces County Facebook Post #4). Table 10 provides the SA values for the LPHO and public comments during this period.

Table 9

Nueces County (NC): Sentiment Polarity Values

Post date	Post ID	Theme	Post-SA value	Average comment SA value
3/27/2020	1 - NC	Informative	4	0
4/1/2020	2 - NC	Informative	3	0
4/2/2020	3 - NC	Informative	4	3
4/8/2020	4 - NC	Directive	4	0
4/20/2020	5 - NC	Directive	4	0
Average total SA values			3.67	0.5
Community polarity value				3.17

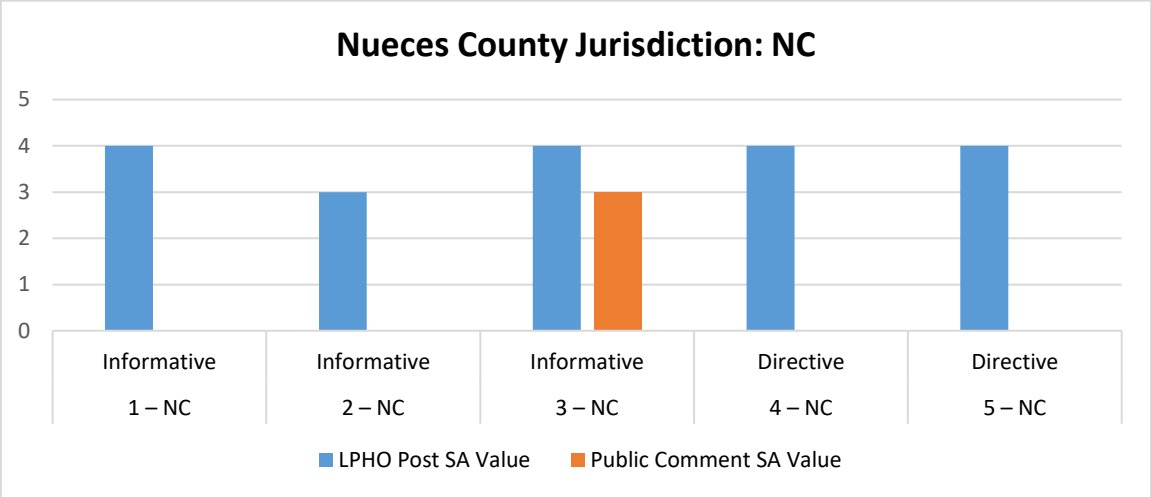
Note. SA = sentiment analysis.

The researcher identified this post as having a directive communication method because it was an announcement that did not provide additional information or hyperlinks to access the order or anything else about the COVID-19 pandemic activity. Although the theme was directive, the MaxQDA SA assessed this post as *slightly positive* with a value of 4. This post had no associated public comments and included only two likes and one share; therefore, the average comment sentiment value was 0 (*no sentiment*). Figure 8

shows how the SA differs based on the risk communication approach used by Nueces County. A lack of public engagement and interaction on government-run social media platforms can indicate a more significant disconnection between the government and the general public (Clayton, 2021). This can significantly hinder the ability of the LPHO to effectively engage with its citizens and promote public participation during the shelter-at-home orders.

Figure 8

Nueces County (NC) Facebook Sentiment Analysis (SA)



Note. LPHO = local public health organization.

Sentiment Analysis: City of Corpus Christi

CoCC has 51,000 Facebook followers and published eight posts that primarily mentioned the shelter-at-home orders mandated by Nueces County. Although CoCC issued its stay-at-home order and amendments, the Facebook posts did not directly address them; instead, they only referenced the Nueces County-mandated shelter-at-home orders. The local community had an active social media presence and commented on the

posts published by the city more than the county (see Table 11). The researcher identified five posts with an informative communication method and the remaining three with a directive communication method (see Figure 9). The informative posts had higher comment SA values than the directive posts. This finding demonstrates that the community is more receptive to emergency response messages that provide further information to the public when compared to the directive approach of posting the order and public reminders of penalties associated with the order and amendments.

The researcher identified the need for coordination between the CoCC and the higher level local public health organization in Nueces County. This lack of unified command was evident in the data findings based on the two individually issued shelter-at-home orders by the LPHO and the fluctuating positive and negative sentiments exhibited by the community through public comments on Facebook

Table 10

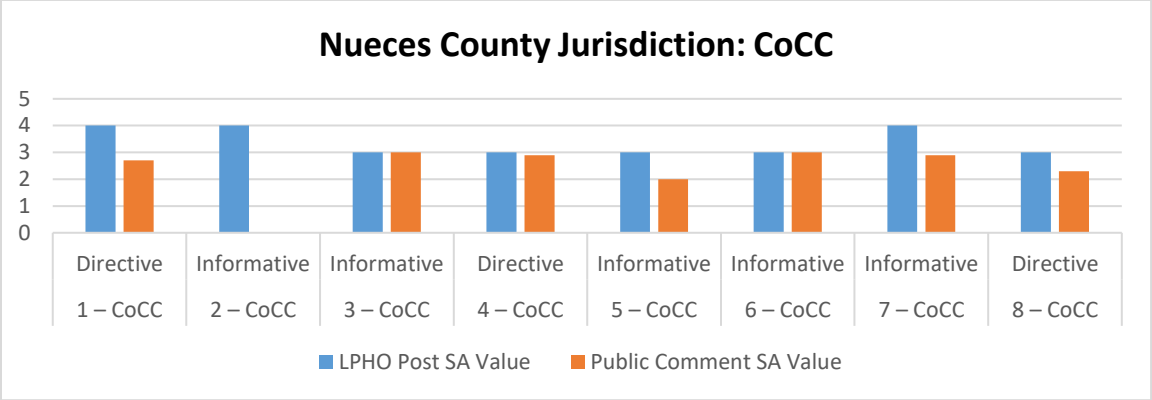
City of Corpus Christi (CoCC): Sentiment and Polarity Values

Post date	Post ID	Theme	Post-SA value	Average comment SA value
3/25/2020	1 - CoCC	Directive	4	2.7
3/30/2020	2 - CoCC	Informative	4	0
3/31/2020	3 - CoCC	Informative	3	3
4/1/2020	4 - CoCC	Directive	3	2.9
4/1/2020	5 - CoCC	Informative	3	2
4/2/2020	6 - CoCC	Informative	3	3
4/3/2020	7 - CoCC	Informative	4	2.9
4/8/2020	8 - CoCC	Directive	3	2.3
Average total SA values			3.4	2.4
Community polarity value				1.0

Note. SA = sentiment analysis.

Figure 9

City of Corpus Christi (CoCC) Facebook Sentiment Analysis (SA)



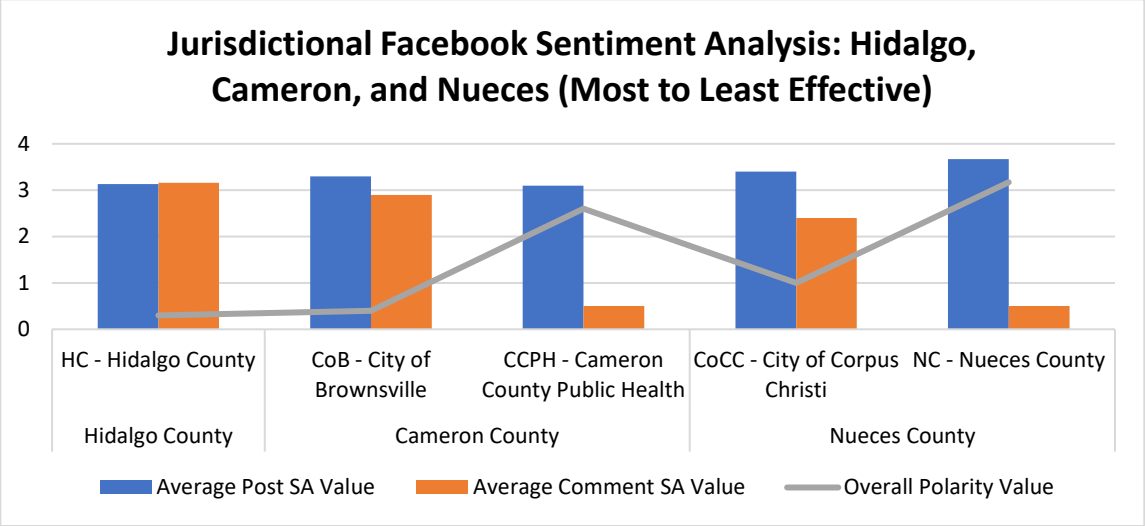
Note. LPHO = local public health organization; SA = sentiment analysis.

Summary of Findings

The risk management process used in each jurisdiction varied during the COVID-19 pandemic shelter-at-home orders. The orders demonstrated that unified command is the best practice for LPHOs to use with agencies within the organization and other influential local public health stakeholders during a pandemic. Three unified command approaches were identified by the researcher that were used by the LPHOs' risk management process and included the following: (a) Hidalgo County: multiagency unified command, (b) Cameron County: multijurisdiction unified command, and (c) Nueces County: multijurisdictional agency command. This section provides the average jurisdictional sentiments of the LPHOs' Facebook posts and comments with the respective polarity values from most to least effective risk management processes (Figure 10).

Figure 10

Jurisdictional Facebook Sentiment Analysis (SA): Hidalgo, Cameron, and Nueces Counties

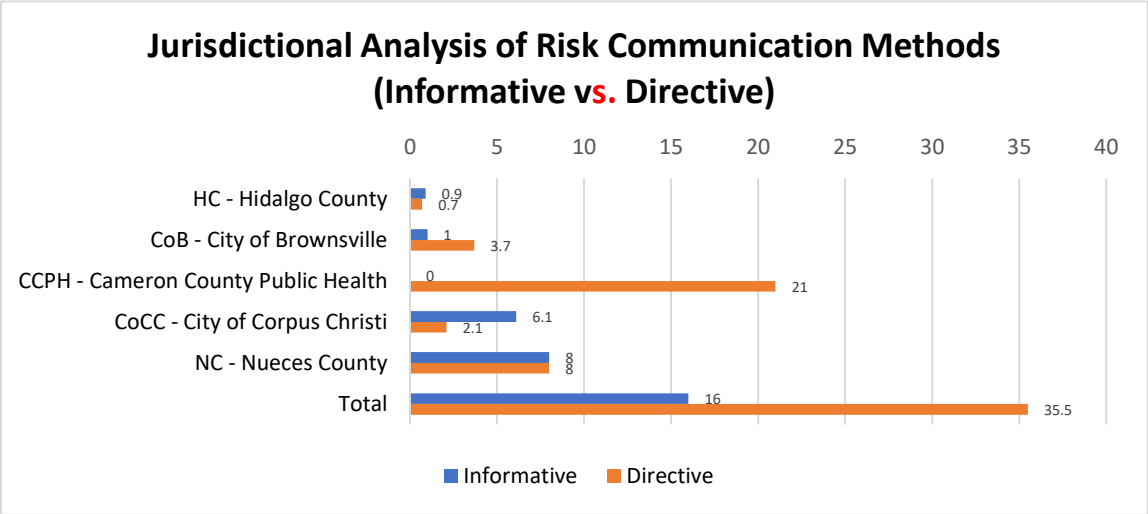


As previously mentioned, polarity values demonstrated the sentiment differences between the public and the LPHOs. Based on the data, Hidalgo County had the lowest polarity value compared to the other jurisdictions. As a jurisdiction, Cameron County had the second lowest polarity value because of CoB's low polarity value of 0.4; CCPH's polarity value of 2.6 contributed the most to this jurisdiction's overall polarity value of 3.0 whereas Nueces County's jurisdictional polarity value of 4.17 was primarily because of its overall polarity value of 3.17, which was the highest compared to the other jurisdictions. Moreover, CoCC had the third lowest polarity value for this study, identifying the overall Nueces County jurisdiction as having the least effective risk management process because of the lack of a unified command approach. In addition, the informative communication method had the lowest polarity value in the counties of Hidalgo and Cameron compared to the directive approach. CoCC was the only LPHO with a lower polarity value of 2.1 for the directive communication approach and a

polarity value of 8 for the informative method. As shown in Figure 11, the overall polarity value for the informative communication method for all jurisdictions is 16, and the directive theme had an overall value of 35.5.

Figure 11

Jurisdictional Analysis of Risk Communication Methods



These values represent the importance of using risk communication as an opportunity to provide information to the public rather than just telling them what they need to do. In the context of unified command, collaborative governance is imperative for county governments to use to engage when working with other local public health stakeholders to best identify risks, implement safety measures, and communicate promptly to the public. This study suggests that adopting the unified command model is crucial for successful risk management during a significant public health crisis such as the COVID-19 pandemic. By establishing a coordinated and collaborative approach, the unified command model ensures that all stakeholders, including government agencies, healthcare

providers, and community organizations, work together to mitigate the impact of the crisis on the population.

The two consistent guiding principles identified in this study were collaborative governance and risk communication with unified command in a risk management process during the COVID-19 pandemic. Dye (1992) suggested that public health policies like shelter-at-home orders can significantly impact how communities perceive pandemic risks and their overall feelings toward government actions. Collaborative governance and risk communication are essential components in the risk management process; however, they depend on strong leadership efforts to come together and coordinate emergency management activities to help protect the community from the pandemic or other crises.

CHAPTER 5: CONCLUSIONS AND RECOMMENDATIONS

During the 2019 novel coronavirus (COVID-19) pandemic, the risk management process included local governments mandating shelter-at-home orders throughout the community and communicating with the public on Facebook. This study assessed two primary components of the local risk management process: a content analysis of the shelter-at-home orders policy and an evaluation of risk communication activity on Facebook. The study findings established that effective risk management requires collaboration between local public health organizations (LPHOs) within a jurisdiction and unified risk communication activities to inform the public. This study used the risk perception theory that states people's perceptions of risk are influenced by the likelihood and severity of the risk and how it is presented or communicated to them. Paek and Hove (2017) stated, "Risk perception is important in health and risk communication because it determines which hazards people care about and how they deal with them" (p. 1). Risk perception theory was evaluated through the sentiments expressed in the LPHOs' Facebook posts and public comments to determine the community's overall acceptance of local shelter-at-home orders. This study aimed to determine effective risk management processes and communication activities used by LPHOs during the COVID-19 pandemic shelter-at-home orders.

According to the DeSalvo et al. (2017), establishing collaborative governance between LPHOs and officials is crucial to effective communication; this builds public trust and ensures that decision makers have access to the necessary information. This study used FEMA's (2017) National Incident Management Systems (NIMS) communication framework developed to standardize emergency management processes

that would assist government officials during an emergency. The NIMS framework provides guidelines for incident communications and information management making it essential for LPHOs to have effective risk communication and information management when responding to public health emergencies. Using the NIMS framework, LPHOs can ensure that they have clear and consistent communication and information management protocols to respond to public health emergencies (FEMA, 2017). The findings have shown that the jurisdictions that followed FEMA's guidance had a more effective risk management process. Following the incident command structure is critical to developing an effective risk management process because it calls for a standardized approach to working with stakeholders and the community to ensure that emergency management activities are successful and accepted by the community throughout the emergency. These findings correspond with FEMA's statement that

> the best-executed plan for communications during incidents cannot overcome poor operational preplanning, nor can it substitute for proper incident command. On the other hand, poor communications can most certainly disable otherwise adequate emergency response. However, well used, communications provide a necessary means for emergency response support through the Incident Command System. (Hawkins, 2007, p. 12)

Sentiment analysis (SA) of the published LPHOs' Facebook posts was evaluated to determine the best risk communication practices during the COVID-19 pandemic. Two communication approaches were thematically constant in this study and included informative and directive communication methods. These communication methods were assigned to each post to determine the most effective communication approach that each

LPHO used during the orders and during their risk communication activities. Posts identified with the directive communication approaches were those that only provided the actual order to the community and informed the community of how to report individuals to the local law enforcement agency for noncompliance. LPHOs that employed the directive communication approach in their posts tended to yield negative and neutral sentiments from the community.

In contrast, the informative messages had more *positive*, *slightly positive*, and *neutral* sentiments. Neutral sentiments expressed in Facebook posts and comments provide valuable insights into public perception and attitudes toward a pandemic. The researcher used additional linguistic and contextual information to help classify neutral sentiments accurately for this study. Therefore, this study identified neutral LPHO posts as nonbiased and informative public health messages. In addition, communities with neutral sentiments tended to have lower polarity values that demonstrated the community had similar emotions, understood the LPHOs' emergency management activities, and demonstrated a strong public health emergency management network (PHEMnet). SA can positively add to the field of public health by allowing public health organizations and policy makers to understand the level of public concern and make informed decisions to address a pandemic or other public health emergencies. The data findings demonstrated that the risk management process of LPHOs that incorporated collaborative governance and risk communication using a unified command approach had more influence on their community's risk perception during the shelter-at-home orders making the findings consistent with the FEMA and CDC literature and recommendations.

Guiding Principle 1: Collaborative Governance

The shelter-at-home orders mandated by the local public health officials required collaboration in and outside the organization to ensure effective implementation and risk communication. According to Emerson et al. (2012), collaborative governance acknowledges the government, including its agencies, as the primary leaders of the partnership during emergencies, and all other entities are regarded as participatory agents. Donahue et al. (2011) also explained that the government allocates tasks suited for direct government performance across and within sectors while delegating other responsibilities to private sector organizations with the skills, knowledge, and assets the government does not possess.

The LPHOs used their form of NIMS to develop their local risk management plans based on FEMA's recommendations and CDC's Public Health Emergency Preparedness (PHEP) program's grant funding requirements. All three jurisdictions mandated shelter-at-home orders within their respective jurisdictions differently using a variation of the NIMS unified command model. LPHOs need to implement a risk management process to mitigate these risks. The three county orders used the top-down incident command process within their shelter-at-home orders, providing the community with information to understand better the shelter-at-home order and overall local PHEMnet in their jurisdiction during the pandemic. However, the stay-at-home order mandated by the mayor of Corpus Christi in the Nueces County jurisdiction did not recognize any form of the emergency management process, which demonstrated a disregard and disconnection of collaborative governance and joint communication activities between Nueces County and CoCC and potentially with public health

counterparts at the state and federal levels. Furthermore, although both Nueces County and CoCC LPHOs had an established public health district, Corpus Christi–Nueces County Public Health District (CCNCCPHD), formed through an interlocal agreement between Nueces County and CoCC, it failed to be a contributing factor in helping coordinate emergency management efforts between the Nueces County and the CoCC LPHOs.

The data show that Hidalgo County worked closely with the Hidalgo County Health and Human Services Department to develop local orders and communicate risks with the public through Hidalgo County's Facebook account. Hidalgo County mandated two orders in March and July 2020 and continued to demonstrate the importance of collaboration among the county government's elected officials and appointed public health administrators. For instance, the county acknowledged the health department in the first order, and recognized the Hidalgo County Health Authority, Dr. Ivan Melendez, and Hidalgo County Health and Human Services Director, Eddie Olivarez through risk communication activities. In addition, the amendment stated that the public health administrators "have the authority to administer state and local laws relating to public health within the jurisdiction of the County of Hidalgo" (The County of Hidalgo, 2020c, p. 1). Hidalgo County also demonstrated its adherence to the emergency management process by aligning its activities with the recommendations from the Texas Department of Health and Human Services (state public health agency) and CDC (federal public health agency). As a result of adopting a unified command approach, which included multiple agencies and made the health department the primary subject matter expert, Hidalgo County's risk management process was most effective. The Hidalgo County

judge's office was this jurisdiction's lead governmental authority and Facebook risk communicator. Based on the literature and data findings, the researcher concluded that the intentional implementation of the unified command approach positively impacted risk communication within the local public health organization and its centrally structured and tightly directed risk management process during the study period.

The counties of Cameron and Nueces had LPHOs at the county and city levels that were actively involved and communicated with the public during these orders. Based on the content analysis, Cameron County was the second most effective jurisdiction that demonstrated collaborative governance using a multiple-jurisdiction approach that included the City of Brownsville (CoB). The shelter-at-home orders and Facebook activity demonstrated this PHEMnet by only having Cameron County as the leading LPHO that issued the mandate and CoB as the LPHO that led the risk communication activities on Facebook. By using the multijurisdictional unified command approach, Cameron County and CoB demonstrated another best practice model toward the unified command approach. As previously mentioned, the management process of this risk came from the ineffective Facebook risk communication activity from the Cameron County Public Health (CCPH) account. Cameron County quickly recognized that its health department did not have a large community following and adapted its risk management process to include CoB as its primary risk communicator during the orders. This finding further demonstrates that unified command provides more efficient use of resources and can help prevent duplicating efforts when responding to a national emergency at the local level.

The jurisdiction of Nueces County issued two separate shelter-at-home orders mandated by the county judge and the mayor of CoCC. The city referred to its order as a stay-at-home order that was intended for citizens that only resided within the city limits; in contrast, the county's order encompassed the entire Nueces County jurisdiction, including the residents of CoCC. Both orders were very similar and lasted until April 30, 2020. These two independent emergency management actions demonstrated that two risk management processes were being used by Nueces County and CoCC, which is consistent with a locally fragmented PHEMnet. The lack of collaborative governance between Nueces County and CoCC must demonstrate better collaboration efforts from the CCNCPHD. A primary purpose of the CCNCPHD was to align the efforts of the county and city leadership based on the type and form of the LPHO during the COVID-19 pandemic. The jurisdictional content and SA showed that Nueces County and CoCC had a highly fragmented PHEMnet, resulting in this jurisdiction having the least effective risk management processes identified in this study.

Furthermore, CoCC did not have to issue its order but could have followed and collaborated with Nueces County. The city's duplicated effort was unnecessary and showed further poor collaborative governance between the leading public administrators in this jurisdiction. The two separate orders clearly show that local leaders in Nueces County did not follow the NIMS unified command structure or the CDC's Crisis and Emergency Risk Communication recommendations.

Guiding Principle 2: Risk Communication

Risk communication during the COVID-19 pandemic was essential to ensure the community understood and followed public health measures during the shelter-at-home

orders. Facebook provided a social media platform for government officials to communicate with the public. Kosinski et al. (2016) stated that Facebook offers unprecedented insights into the dynamics and organization of individual risk perception within social systems with the potential to radically improve people's understanding of human behavior. Using Facebook, government officials could reach a large and diverse audience to increase transparency and public trust. Public health messages and public comments posted on Facebook were evaluated in this study to review the public's sentiments and further assess collaborative governance efforts between local government officials and the community. The sentiments from the posts and comments were assigned values to quantify the results and compare the jurisdictions in this study. The five sentiment values included 5 (*positive*), 4 (*slightly positive*), 3 (*neutral*), 2 (*slightly negative*), 1 (*negative*), and 0 (*no sentiment*). Community polarity values were calculated to evaluate the effectiveness of each LPHO's Facebook post published to demonstrate a strong or weak relationship between the LPHOs and their community. Low polarity values indicated stronger relationships between the LPHO and the community. In contrast, high polarity values demonstrated a weak relationship between the LPHOs and their respective community because of the significant difference in their sentiments and emotions expressed on Facebook.

This study identified Hidalgo County as having the most effective risk management process based on the two local shelter-at-home orders and Facebook risk communication based on their community polarity value of 0.03. This polarity value indicates that the Hidalgo County LPHO and its citizens shared similar sentiments and feelings toward the COVID-19 pandemic and agreed with the need for a shelter-at-home

order to mitigate this emergency. The study's findings identified that risk communication messages were primarily published on the county's official Facebook page to inform the citizens of the local orders and amendments. Hidalgo County published six Facebook posts about the shelter-at-home orders; 66.7% of posts were identified as informative and 33.3% of posts were identified as directive, and the informative posts had the lowest sentiment values when compared to the identified directive posts. These findings further support other studies, which suggest that the public prefers government officials to provide information in risk messages (Perrin & Anderson, 2019). Furthermore, the research data prove that overall informative posts during an emergency are the most effective communication approach because of the low community polarity values determined through this study's SA.

This study revealed the jurisdiction of Cameron County to have two LPHOs, CCPH and CoB, that actively communicated the shelter-at-home orders to the public. The risk management process identified in this study for this jurisdiction included the local shelter-at-home orders mandated by the county judge and risk communication activity led by CoB. The jurisdictional analysis of the Facebook activity demonstrated the local leaders' capability to adapt to a more effective risk management process by having CoB lead the risk communication activities beginning March 28, 2020, until the end of the order. Although the CCPH department initiated the risk communication process on Facebook, the posts needed more community outreach and influence based on the lack of participation and reactions to each message. As a result, CCPH had the fourth highest sentiment differences in this study and contributed these high values to the jurisdiction's overall polarity value of 3.0. Furthermore, the last post demonstrated that the informative

approach is the most effective method when communicating risks during an emergency. Although CCPH was the weakest LPHO Facebook contributor in this jurisdiction, the organization quickly aligned its risk management process with CoB (as shown in Figure 6). CoB used its official Facebook account to disseminate six critical messages regarding the shelter-at-home orders. Unlike CCPH, Brownsville continued to publish posts throughout the shelter-at-home order to update the public on the order and amendments effectively. These findings suggest that the county and city collaborated to adapt their risk management process to communicate COVID-19 pandemic risks and shelter-at-home orders. This alignment of the city's posts and the county's orders demonstrated collaborative governance and coordinated risk communication during the shelter-at-home orders. The data findings also suggest that the community entrusted and attained most of its public health information regarding the shelter-at-home orders through CoB's Facebook account rather than the CCPH.

This study identified Nueces County as having the least effective risk management process during the shelter-at-home orders and an overall jurisdictional polarity value of 4.17. This was the only jurisdiction in this study with two LPHOs, Nueces County and CoCC, that issued independent shelter-at-home orders and communicated with the public through their own Facebook accounts. As previously stated, each LPHO issued independent shelter-at-home order and amendments with the same end date of April 30, 2020, and similar penalties for individuals who did not follow the mandates. Nueces County published five Facebook posts, three identified as informative and two as directive. Nueces County had the lowest community participation in this study, and four of the Facebook posts did not have any form of public participation

via comments or reactions. The third post, published on April 2, 2022, had the highest community participation but only three community comments. Nueces County had the study's highest polarity value of 3.17, indicating that this jurisdiction needs to develop a more robust PHEMnet to have an active online community presence on Facebook to be prepared for future public health events or emergencies.

CoCC had higher community involvement than Nueces County but was still ranked as having the study's third highest polarity value following CCPH and Nueces County. CoCC published eight posts: five informative and three directive. Although the city mandated its shelter-at-home order, its Facebook posts did not directly inform the public of this emergency management activity. The CoCC posts generally referenced the county's order and provided the community with county information, such as the COVID-19 county hotline and email address. In addition, the CoCC risk messages mostly used the informative approach and further supported low polarity values when using this approach over the directive method. In 2017, FEMA reported a correlation between the absence of collaborative governance and unified risk communication activities and jurisdictions having the highest polarity value with its community. Nueces County and CoCC's agency command approach was the least effective in this study because of the lack of effective unified command practices and activities. The study's findings suggest that Nueces County and CoCC should have worked together to serve their community best rather than focusing primarily on individualized organizational interests and emergency management activities during the COVID-19 pandemic.

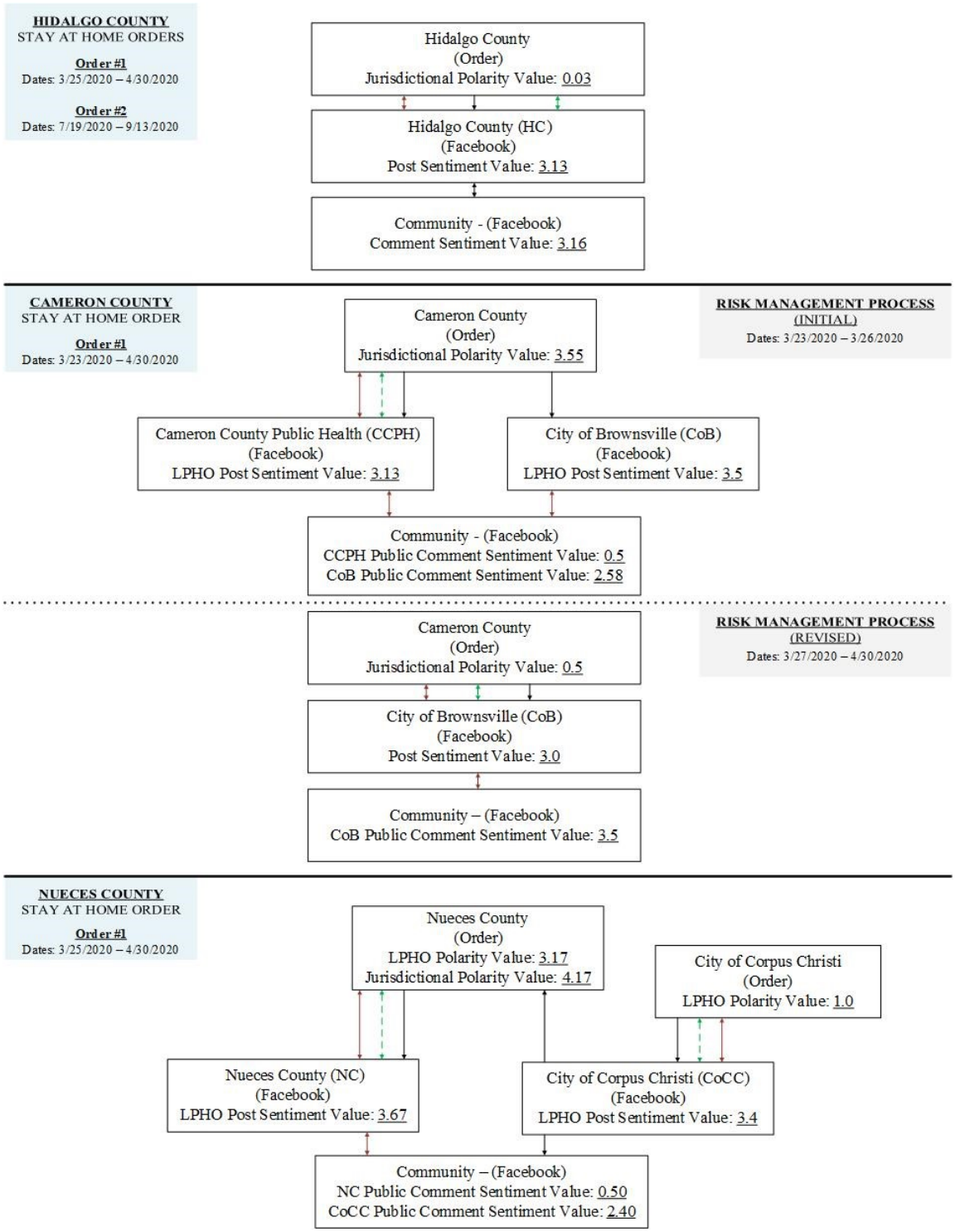
Unified Command as Best Practice

This study identified collaborative governance and risk communication as the main guiding principles for an effective risk management process at the local levels of government. The unified command approach is one of the five components of the NIMS that enables all levels of government to speak the same language in a unified approach to mitigate an emergency (HHS, n.d.). The unified command approach allows multiple agencies and jurisdictions to participate during an emergency as part of the incident command system (ICS; FEMA, 2017). This study found that unified command was the best practice a jurisdiction could use when communicating risks during the COVID-19 pandemic. Each jurisdiction studied was identified using a variation of the NIMS unified command framework: Hidalgo County, a single jurisdiction unified command with multiple agencies; Cameron County, a unified command with multiple jurisdictions; and Nueces County, an agency command with multiple jurisdictions. The study's findings support that a more cohesive unified command framework correlates with more effective risk communication between the LPHOs and the community. (FEMA, 2017). Figure 12 outlines each jurisdiction's unified command framework to show the risk management process used for communication activities on Facebook about the local shelter-at-home orders.

According to FEMA (2022), the unified command model allows for clear lines of authority, decision making, and efficient allocation of resources in and out of the organization based on collaborative governance with local public health stakeholders. This study identified Hidalgo County as having the strongest unified command model even though they used the simplest and most straightforward UC framework.

Figure 12

Jurisdictional Risk Management Processes of Hidalgo, Cameron, and Nueces Counties



By using the most organized and efficient response approach, Hidalgo County's risk management process demonstrated the significance of using the unified command model in response to the COVID-19 pandemic. In addition, the Hidalgo County PHEMnet incorporated several public health agencies, including the county judge's office and Hidalgo County Health and Human Services, and other interagencies, giving the county more control over the unified command framework and enabling them to lead risk communication activities on social media throughout the jurisdiction. (FEMA, 2017). This finding demonstrates that developing and implementing a unified command framework within a LPHO is critical to responding to and mitigating a public health emergency. The HHS (n.d.) supports those findings by emphasizing that unified command allows all involved parties to speak with one voice leading to a faster response time and more effective use of resources during an emergency. The Facebook SA conducted for Hidalgo County correlates with their overall low polarity value, proving that a developed and more structured risk management process yielded higher community consent toward the local shelter-at-home orders. Evaluation of other Facebook accounts from the major cities in Hidalgo County also showed a unified response and communication activities to distribute the same or similar messages to the public. Hidalgo County effectively influenced the community's overall risk perception regarding the importance of the COVID-19 pandemic shelter-at-home orders issued twice in March and July 2020.

Cameron County used a multiple jurisdictional unified command approach for its risk management process by involving CoB and using its Facebook account to effectively communicate the COVID-19 pandemic risks to the public. The study initially identified

Cameron County as the primary actor based on its jurisdictional authority to mandate the community to shelter at home to mitigate the pandemic locally and had CoB as a participating agency that allowed both entities to communicate risks on Facebook. CoB aligned its Facebook posts to communicate the county's shelter-at-home orders with the community. Tehranian (1979) emphasized the importance of working with municipalities under the county's jurisdiction to ensure that all agencies communicate the same message. Lack of community involvement on the CCPH Facebook account prompted the adaptation of a new risk management process between Cameron County and CoB. CCPH ceased using its Facebook account and closely collaborated with CoB to allow them to be the primary communicator during this time with the public. Although Cameron County recognized its ineffective risk communication activity on Facebook, it should have continued to regularly post risk messages to establish leadership in the community and further demonstrate transparency of its efforts.

The Nueces County jurisdiction used agency command within the two LPHOs, Nueces County and CoCC. Agency command allows an organization to have its decision making and actions with little coordination with other local stakeholders (Burgiel, 2019). In comparison, the unified command model is a practice that coordinates with multiple agencies, organizations, and other local jurisdictions to share resources and information throughout an emergency effectively (Burgiel, 2019). A significant disadvantage of using agency command is that it can lead to less coordination and communication between LPHOs such as when Nueces County and CoCC issued their shelter-at-home orders. Having multiple local orders in place also creates confusion for the public because different rules and guidelines may apply based on the location (Tyson & Funk, 2022).

Moreover, the Facebook activity of Nueces County and CoCC needed to demonstrate coordination between the LPHOs because neither LPHO nor its officials acknowledged the others' emergency management activities. An interesting finding during this time was that the county and Corpus Christi collaborated to conduct joint live briefings that included the county judge, city mayor, city manager, and director of the CCNCPHD, publicly demonstrating a collaborative effort with the LPHOs. Although these briefings took place, the overall risk management process showed more of a structured agency command in which each LPHO primarily used its resources to independently mandate and communicate the shelter-at-home orders to the public. During any emergency, each LPHO in the Nueces County jurisdiction, Nueces County and CoCC, must overcome its priorities to have effective collaborative governance of a public health emergency because not doing so leads to duplicated efforts that do not positively influence the community's risk perception to follow the shelter-at-home orders.

Nueces County and CoCC should have used its established public health district as the lead coordinator between the LPHOs and their officials to ensure that all government leaders and public administrators involved in this incident communicated effectively and to share information promptly with each other and the public. Today, the CCNCPHD no longer exists as it did at the beginning of the COVID-19 pandemic. The city is the primary actor that leads the public health efforts and provides services to residents living outside the city limits; the researcher did a quick internet search that showed the current name had stayed the same. In addition, the COVID-19 pandemic seemed to exacerbate the tensions between the Nueces County judge and the CoCC city manager as publicized by a local news source regarding the eradication of the established

local public health district during the COVID-19 pandemic. As mentioned on Channel 3, a local media source in the Nueces County jurisdiction, City Manager Peter Zanoni issued a letter without prior notice to County Judge Barbara Canales on October 19, 2021, with the intent of only having a city health department and not a joint public health district (Garza, 2021). The article quoted Judge Canales as saying that the decision to part ways during the COVID-19 pandemic is not being made at the best time and "if you're [city manager] thinking about forming another department, your head is not in the game because what we need to focus on is saving lives and protecting people" (Garza, 2021, p. 1). The Nueces County jurisdiction performed poorly during the shelter-at-home orders because of their lack of unified command and unestablished risk management process between Nueces County and CoCC. These findings further prove that the jurisdiction's overall high polarity value correlates with an ineffective risk management process between Nueces County and CoCC because of their use of agency command within each LPHO rather than unified command between them.

The data support that the unified command model that involves agencies and other LPHOs is the best practice as witnessed in the counties of Hidalgo and Cameron during the local shelter-at-home orders and Facebook communication activities regarding COVID-19 pandemic risks to the public. These two counties had the lowest sentiment values between the LPHO's posts and the public's comments, demonstrating higher public trust levels in government officials and emergency management actions in the counties of Hidalgo and Cameron during the pandemic. Agency command was identified as the unified command approach used by Nueces County and CoCC and was the least effective command style identified in this study. Lack of coordination between

community leaders in Nueces County and CoCC resulted in the least effective and practical risk management process evaluated in this study. In addition, poor collaboration between governments can spread misinformation and mistrust among the public (Office of the Surgeon General, 2021). Moreover, the lack of collaborative governance and risk communication between these two LPHOs may have caused public confusion and emergency management inefficiency resulting in low public trust in the community during the pandemic and for future emergencies.

Expansion of Current Study

This section discusses how the research can be expanded to include different concepts to enhance the study further. Evaluating the risk management process is an organizational factor that can be analyzed to determine whether the LPHO is proactively following its emergency management plan or is only reactively responding to the emergency. Current risk communication plans play a vital role in managing public health emergencies, such as pandemics or natural disasters. Reviewing local risk communication plans for a study can provide the researcher with more detailed information regarding the organization's risk management process during an emergency. Doing so would allow the researcher to identify whether LPHOs used their plan or just have it as a formality to continue receiving CDC PHEP funding. In addition, it helps ensure that the plans stay updated and effectively address current and future public health threats (EPA, 2023).

Evaluating risk communication plans can allow the researcher to identify gaps or weaknesses in the current plans (CDC, n.d.-d). By identifying these areas, organizations can improve their response to public health emergencies and better protect the health and safety of the community. Moreover, reviewing risk communication plans can also help

build public trust and credibility. When the public is informed and engaged in the process, they are likelier to take action to protect themselves and others (WHO, 2020b). Krippendorff (2013) emphasized that content analysis is a valuable tool for researching government policies during an emergency because it allows researchers to systematically and objectively analyze large amounts of written text.

Research Implications

The information for this research allowed for the content analysis of the shelter-at-home orders mandated and Facebook SA for the South Texas jurisdictions of the counties of Cameron, Hidalgo, Nueces and the CoCC. As shown in Figure 12, the data analysis consistently maintained that unified command was the optimal model to follow when communicating risks to the public during an emergency. A unified command structure calls for a definitive line of authority while integrating stakeholders to improve the community's risk perception by providing accurate and consistent information through reliable public organizations (FEMA, 2017). The information used in this study was derived from published documents, shelter-at-home orders, and Facebook posts proposing that the unified command approach is the best emergency management model used in this research. Moreover, throughout the study, the two guiding principles were identified as collaborative governance and risk communication. These principles have been emphasized in previous studies as integral components when designing and implementing an effective risk management process to address an emergency. For example, Farcas et al.'s (2021) study found that using unified command helped improve collaboration and communication between different organizations, leading to more efficient use of resources and better outcomes. Similarly, Burkle et al. (2007) found that

using unified command helps improve epidemiological efforts to reduce the overall spread of diseases such as COVID-19 in the community.

The collaborative governance evaluated in this study focused on the shelter-at-home orders' content analyses and risk communication strategies used by the LPHOs on their Facebook account. Collaborative governance is the practical application of governments, agencies, and organizations working together to exchange ideas and share resources during an emergency (FEMA, 2017). This study evaluated the orders to determine whether collaborative governance was publicly transparent because it signifies that the local officials recognize the public health administrators as the subject matter experts during the COVID-19 pandemic. Effective risk communication ensures that the public receives clear and accurate information about the risks associated with a public health emergency such as the COVID-19 pandemic and how to protect themselves and others. This can also increase public trust in official information sources and encourage individuals to take recommended actions to reduce the spread of a virus. Using a two-way risk communication platform such as Facebook, LPHOs engaged with the community and received feedback on their response to the pandemic and shelter-at-home orders (Hattke & Hattke, 2019). Hence, the need is critical to establish a PHEMnet that can play a crucial role in developing an effective risk management process among LPHOs and the public during a pandemic and for future public health emergencies to communicate risks better to their community.

Study Limitations

The mixed, multiple-case study of the risk management process during the shelter-at-home orders focused on the jurisdictions of Cameron, Hidalgo, and Nueces

counties; these jurisdictions are the three largest counties in the Texas Department of Health and Human Services Region 11. This study's sample size was limited to three similar jurisdictions because of the evaluation of their risk communication activities, which limited the ability to extend the findings to emergency management activities in other geographical areas in South Texas and throughout the nation. Therefore, the researcher examined how the three jurisdictions addressed and mitigated risks throughout the shelter-at-home orders to identify the most effective approach for communicating risks that would influence people's perceptions of risk. The geographical limitation further presented two significant issues because of the smaller sample size and generalizing the data findings to a larger population and different communities elsewhere. Deziel (2018) stated that small sample sizes retrieved from Facebook can contradict the actual population's sentiments. Increasing the sample size of this study could have contributed to gathering more sentiments and data across a larger population.

A participant survey could have allowed the researcher to gather primary data that further supported or hindered the overall research findings. The quantitative data acquired from participant surveys allow researchers to gather data that can be analyzed using statistical methods to identify relationships between variables and accurately predict future public health behaviors throughout a pandemic (Wilkins et al., 2019). An anonymous participant survey could have been used to identify the community members'

- public trust in their jurisdictions' government officials and local public health organizations
- understanding and acceptance of the mandated shelter-at-home orders
- actual sentiment of the shelter-at-home orders

- individual and community risk perception regarding the COVID-19 pandemic based on the LPHO risk communication activities

Research surveys can provide valuable data on a specific population and topic to properly gather information on community attitudes, beliefs, behaviors, and demographics. Surveys can also measure changes over time and evaluate the effectiveness of programs or interventions. They provide a cost-effective and efficient way to gather large amounts of data from diverse participants (Wilkins et al., 2019).

Another limitation of this study was the evaluation using only one social media platform, Facebook. Using one social media platform limited the study by not including the SA of community members who prefer social media platforms, such as Twitter, Instagram, YouTube, TikTok, and others. These different social media platforms may possess characteristics that can demonstrate other biases that could affect the overall results of the SA. It is important to note that each platform has unique characteristics, audience, and culture, which can affect the SA results. Therefore, it is crucial to consider these factors when conducting SA on different social media platforms.

Given these limitations, it is crucial to consider the data quality when conducting SA on Facebook and the potential biases in the data (Alaoui & Gahi, 2019). Facebook allowed the researcher to study how the LPHOs connected with the public to implement the shelter-at-home orders. This social media platform also allowed the researcher to conduct SA based on the data collected from public opinion during the shelter-at-home mandates. According to Olmstead and Barthel (2015), several limitations exist when using Facebook in research, including limited access to data because of privacy concerns,

possible bias in the content displayed by Facebook algorithms, and the possibility that account users in a given jurisdiction are not representative of the larger population.

Conclusion

This study analyzed LPHOs' local risk management processes during the COVID-19 pandemic shelter-at-home orders. The data findings in this study were determined through content and SA of LPHOs and their influence on their community's risk perception using Facebook. This research used two types of analyses: content analysis and SA. The content analysis of the policy focused on evaluating the shelter-at-home orders and amendments from three South Texas jurisdictions of Cameron, Hidalgo, and Nueces counties to evaluate the contents of the mandate and their collaborative governance with other local public health stakeholders during this period. At the same time, the SA aimed to evaluate the sentiments exhibited by the LPHOs and the community served. The data findings indicate that an effective risk management process used the unified command approach to implement an order to communicate the risks to the public on Facebook.

This study revealed that the unified command approach was the most essential and effective concept in risk management during the COVID-19 pandemic. The unified command is an integrated emergency management approach that must be used during an emergency because it helps to ensure that information about risks is communicated effectively and accurately to the public and that the government can respond to risks in a coordinated manner. These factors can significantly impact risk perception by reducing confusion and improving public confidence in the government's ability to protect their safety and well-being. This study demonstrated that the unified command approach that

used the most centralized and simplified process, similar to Hidalgo County, had the most impact on the community's risk perception. Hidalgo County made significant progress in implementing the shelter-at-home orders and relaying the COVID-19 pandemic risks associated with the mandates in March and July 2020. Moreover, Cameron County and CoB demonstrated the adaptability of the PHEMnet becoming effective when the jurisdictions collaborated to inform the community of the orders.

In contrast, Nueces County and CoCC demonstrated how uncoordinated emergency response activities can significantly dampen the effect of a LPHO's emergency response activities, including mandating local orders and communicating them effectively to the public. To better serve the public during a pandemic, Nueces County and CoCC must collaborate and coordinate risk communication activities to produce better outcomes than they did during the COVID-19 pandemic. The lack of collaborative governance and risk communication activities was evident to the community, correlating their high sentiment polarity values with the LPHOs of Nueces County and CoCC. In addition, the level of public engagement and participation in government decision making can provide important indicators of effectiveness to the community; they can positively or negatively influence community risk perception as seen in the data findings of this study. In addition, social media platforms can assist in determining whether government agencies and other LPHOs within the jurisdiction are working together or separately. Using a multiple agency and jurisdictions unified command approach in the local risk management process proved the most effective when engaging with the communities and shaping their risk perception during the local shelter-at-home orders. Public health organizations can reduce the impact of pandemics on

citizens by understanding how communities perceive risks so that they can develop an effective risk management process by working together in a coordinated manner.

REFERENCES

Adiyoso, W. (2022). Assessing governments' emergency responses to the COVID-19 outbreak using a social network analysis (SNA). *SAGE Open*, *12*(2). https://doi.org/10.1177/21582440211071101

Alaoui, I. E., & Gahi, Y. (2019). The impact of big data quality on sentiment analysis approaches. *Procedia Computer Science*, *160*, 803–810.

Ansell, C., & Gash, A. (2008). Collaborative governance in theory and practice. *Journal of Public Administration Research and Theory*, *18*(4), 543–571.

Association of State and Territorial Health Officials. (n.d.). *Public health governance: State and local health department governance classification map*. https://www.cdc.gov/publichealthgateway/docs/sitesgovernance/public-health-governance-factsheet.pdf

Baeza-Yates, R., & Ribeiro-Neto, B. (2011). *Modern information retrieval: The concepts and technology behind search*. ACM Press.

Bandhakavi, A., Wiratunga, N., Padmanabhan, D., & Massie, S. (2017) Lexicon based feature extraction for emotion text classification. *Pattern Recognition Letters*, *93*, 133–142. https://doi.org/10.1016/j.patrec.2016.12.009

Bengio, Y., Ducharme, R., Vincent, P., & Janvin, C. (2003). A neural probabilistic language model. *Journal of Machine Learning Research*, *3*, 1137–1155. http://www.jmlr.org/papers/volume3/bengio03a/bengio03a.pdf

Birkland, T. A. (2015). *An introduction to the policy process: Theories, concepts, and models of public policy making* (4th ed.). Routledge. https://doi.org/10.4324/9781315717371

Bosomworth, K., Owen, C., & Curnin, S. (2017). Addressing challenges for future strategic-level emergency management: Reframing, networking, and capacity-building. *Disasters*, *41*(2), 306–323. https://doi.org/10.1111/disa.12196

Brown, C. G. (2018). A comprehensive approach to risk assessment. *Journal of Risk Research*, *21*(7), 835–846.

Burgiel, S. W. (2019). The incident command system: A framework for rapid response for biological invasion. *Biological Invasions*, *22*, 155–165.

Burkle, F. M., Jr., Hsu, E. B., Loehr, M., Christian, M. D., Markenson, D., Rubinson, L., & Archer, F. L. (2007). Definition and functions of health unified command and emergency operations centers for large-scale bioevent disasters within the existing ICS. *Disaster Medicine and Public Health Preparedness*, *1*(2), 135–141. https://doi.org/10.1097/DMP.0b013e3181583d66

Burrous, H. (2021, September 9). *Public health preparedness: Where we've been, where we are, and where we're going*. ASTHO. https://www.astho.org/communications/blog/public-health-preparedness-past-present-future/

Cambria, E., Das, D., Bandyopadhyay, S., & Feraco, A. (2017). Affective computing and sentiment analysis. In E. Cambria, D. Das, S. Bandyopadhyay, A. Feraco, A. (Eds.), *A practical guide to sentiment analysis* (pp. 1–10). Springer. https://doi.org/10.1007/978-3-319-55394-8_1

Cameron County. (2020, March 26). *First amended emergency management order with mandatory countywide shelter in place*. https://www.cameroncountytx.gov/first-

amended-emergency-management-order-with-mandatory-countywide-shelter-in-place/

Centers for Disease Control and Prevention. (n.d.-a). *Laboratory response network partners in preparedness*. https://emergency.cdc.gov/lrn/index.asp

Centers for Disease Control and Prevention. (n.d.-b). *Our history - Our story*. https://www.cdc.gov/about/history/index.html

Centers for Disease Control and Prevention. (n.d.-c). *Public health emergency preparedness and response capabilities: National standards for state, local, tribal, and territorial public health*. https://www.cdc.gov/orr/readiness/capabilities/index.htm

Centers for Disease Control and Prevention. (n.d.-d). *Public health emergency preparedness program and guidance*. https://www.cdc.gov/orr/readiness/phep/index.htm

Centers for Disease Control and Prevention. (1996a, July 30). Achievements in public health, 1900-1999: Control of infectious diseases. *MMWR Weekly*. https://www.cdc.gov/mmwr/preview/mmwrhtml/mm4829a1.htm

Centers for Disease Control and Prevention. (1996b, June 28). Historical perspectives notifiable disease surveillance and notifiable disease statistics – United States, June 1946 and June 1996. *MMWR Weekly*. https://www.cdc.gov/mmwr/preview/mmwrhtml/00042744.htm

Centers for Disease Control and Prevention. (2001). *Public health responses supported by CDC's Emergency Operations Center (EOC)*. https://www.cdc.gov/cpr/eoc_responses.htm

Charmaz, K. (2014). *Constructing grounded theory* (2nd ed.). Sage.

Cipolletta, S., Andreghetti, G. R., & Mioni, G. (2022). Risk perception towards COVID-19: A systematic review and qualitative synthesis. *International Journal of Environmental Research and Public Health*, *19*(8), 4649. https://doi.org/10.3390/ijerph19084649

City of Corpus Christi. (2020). *County of Nueces: Order to stay at home*. Nueces County. https://www-cdn.cctexas.com/sites/default/files/covid-19-judge-canales-stay-at-home-order.pdf

Clayton, W. (2021). Government social media engagement strategies and public roles. *Public Performance & Management Review*, *44*(1), 187–215.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Lawrence Erlbaum Associates.

Columbia University. (2021, February 19). *Epidemic, endemic, pandemic: What are the differences?* https://www.publichealth.columbia.edu/public-health-now/news/epidemic-endemic-pandemic-what-are-differences

Comfort, L. K., Ko, K., & Zagorecki, A. (2004). Coordination in rapidly evolving disaster response systems: The role of information. *American Behavioral Scientist*, *48*(3), 295–313.

The County of Hidalgo. (2020a). *Emergency order instituting additional measures due to a public health emergency related to corona virus disease (COVID-19): Shelter-at-home order*. https://www.hidalgocounty.us/DocumentCenter/View/36748/3252020-Final-Modified-Emergency-Orders

The County of Hidalgo. (2020b). *Hidalgo County Judge Richard F. Cortez orders shelter at home order*. https://www.hidalgocounty.us/documentcenter/view/39795

The County of Hidalgo. (2020c). *Second amended emergency order instituting subsequent measures due to a public health emergency (20-003): Shelter-at-home order*. https://www.hidalgocounty.us/DocumentCenter/View/36983/04072020-Amended-Emergency-Order-20-003

Covello, V. T. (2000). Risk communication: An emerging area of health communication research. *Annals of the International Communication Association*, *23*(1), 155–163.

Creswell, J. W. (2013). *Qualitative inquiry & research design: Choosing among the five approaches*. Sage Publications.

Creswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches* (4th ed.). Sage Publications.

Creswell, J. W., & Clark, V. L. P. (2018). *Designing and conducting mixed methods research* (3rd ed.). Sage Publications.

Crowe, S., Creswell, K., Robertson, A., Huby, G., Avery, A., & Sheikh, A. (2011). The case study approach. *BMC Medical Research Methodology*, *11*, 100. https://doi.org/10.1186/1471-2288-11-100

DeSalvo, K. B., Wang, Y. C., Harris, A., Auerbach, J., Koo, D., & O'Carroll, P. (2017). Public health 3.0: A call to action for public health to meet the challenges of the 21st century. *Preventing Chronic Disease*, *14*, E78. https://doi.org/10.5888/pcd14.170017

Deziel, C. (2018, March 13). *The effects of a small sample size limitation*. Sciencing. https://sciencing.com/effects-small-sample-size-limitation-8545371.html

Dicker, R. C, Coronado, F., Koo, D., & Parrish, R. G. (2006) *Principles of epidemiology in public health practice: An introduction to applied epidemiology and biostatistics* (3rd ed.). CDC Stacks.

Donahue, J. D., Zeckhauser, R. J., & Breyer, S. (2011). Getting collaboration right. In J. D. Donahue & R. J. Zeckhauser, *Collaborative governance: Private roles for public goals in turbulent times* (pp. 240–263). Princeton University Press. http://www.jstor.org/stable/j.ctt7spt3.12

Dye, T. R. (1992). *Understanding public policy* (8th ed.). Prentice Hall.

Emanuel, E. J. (2000). Communicating public health risks. *The Hastings Center Report*, *30*(3), S7–S8.

Emerson, K., Nabatchi, T., & Balogh, S. (2012). An integrative framework for collaborative governance. *Journal of Public Administration Research and Theory*, *22*(1), 1–29. https://doi.org/10.1093/jopart/mur011

Environmental Protection Agency. (2023). *Public participation guide: Introduction to public participation*. https://www.epa.gov/international-cooperation/public-participation-guide-introduction-public-participation#:~:text=As%20a%20result%2C%20decisions%20that%20are%20informed%20by,more%20legitimate%20and%20are%20less%20subject%20to%20challenge

Farcas, A., Ko, J., Chan, J., Malik, S., Nono, L., & Chiampas, G. (2021). Use of incident command system for disaster preparedness: A model for an emergency

department COVID-19 response. *Disaster Medicine and Public Health Preparedness*, *15*(3), e31–e36. https://doi.org/10.1017/dmp.2020.210

Federal Emergency Management Agency. (2013). IS-111.A: Livestock in disasters. https://training.fema.gov/is/courseoverview.aspx?code=IS-111.a&lang=en

Federal Emergency Management Agency. (2017). *National incident management system*. Third edition. https://www.fema.gov/sites/default/files/2020-07/fema_nims_doctrine-2017.pdf

Federal Emergency Management Agency. (2022). *About us*. https://www.fema.gov/about

Fenxia, Z. (2022). The community resilience measurement throughout the COVID-19 pandemic and beyond - An empirical study based on data from Shanghai, Wuhan and Chengdu. *International Journal of Disaster Risk Reduction*, *67*, 102664.

Garza, J. (2021, October 20). *City of Corpus Christi and Nueces County end health district partnership* [Video]. KIII-TV. https://www.kiiitv.com/article/news/local/city-of-corpus-christi-and-nueces-county-end-health-district-partnership/503-45f8d447-6656-4ae9-a198-91b2f11e0d97

Gatewood, J., Monks, S. L., Singletary, C. R., Vidrascu, E., & Moore, J. B. (2020). Social media in public health: Strategies to distill, package, and disseminate public health research. *Journal of Public Health Management and Practice*, *26*(5), 489–492. https://doi.org/10.1097/PHH.0000000000001096

Glik, D. C. (2007). Risk communication for public health emergencies. *Annual Review of Public Health*, *28*, 33–54. https://doi.org/10.1146/annurev.publhealth.28.021406.144123

Gonah, L., & Kobie, A. G. (2021). Framework for risk communication and community engagement to improve vaccine uptake for COVID-19 and other vaccine-preventable diseases in low- and middle-income countries (LMIC). *Annals of Global Health*, *87*(1), 123. https://doi.org/10.5334/aogh.3483

González-Padilla, D. A., & Tortolero-Blanco, L. (2020). Social media influence in the COVID-19 pandemic. *Official Journal of the Brazilian Society of Urology*, *46*(Suppl. 1), 120–124. https://doi.org/10.1590/S1677-5538.IBJU.2020.S121

Gostin, L. O. (2020). COVID-19 reveals urgent need to strengthen the World Health Organization. *JAMA*, *323*(22), 2251–2252.

Gostin, L. O., & Hodge, J. G., Jr. (2016). Zika virus and global health security. *The Lancet Infectious Diseases*, *16*(10), 1099–1100. https://doi.org/10.1016/S1473-3099(16)30332-2

Gray, G. M., & Ropeik, D. P. (2002). Dealing with the dangers of fear: The role of risk communication. *Health Affairs*, *21*(6), 106–116.

Halbrook, M. P. (2021). Variolation and the development of smallpox vaccine. *American Journal of Public Health*, *111*(1), 145–146.

Hall, M. (2023). Facebook. *Encyclopedia Britannica*. https://www.britannica.com/topic/Facebook

Hattke, F., & Hattke, J. (2019). Lead by example? The dissemination of ethical values through authentic leader inspiration. *International Journal of Public Leadership*, *15*(4), 224–237. https://doi.org/10.1108/IJPL-06-2019-0034

Hawkins, R. A. (2007). *Disaster response and recovery: Strategies and tactics for resilience*. Wiley.

Heikkila, T., & Gerlak, A. K. (2005). The formation of large-scale collaborative resource management institutions: Clarifying the roles of stakeholders, science, and institutions. *Policy Studies Journal*, *33*(4), 583–612. https://doi.org/10.1111/j.1541-0072.2005.00134.x

Hu, M., & Liu, B. (2004). Mining and summarizing customer reviews. In *Proceedings of the 10th ACM SIGKDD International Conference on Knowledge Discovery and Data Mining* (pp. 168–177). ACM.

Hyett, N., Kenny, A., & Dickson-Swift, V. (2014). Methodology or method? A critical review of qualitative case study reports. *International Journal of Qualitative Studies on Health & Well-Being*, *9*(0), 1–12.

Institute of Medicine. (1988). *The future of public health*. National Academies Press.

Jha, A., Lin, L., & Savoia, E. (2016). The use of social media by state health departments in the US: Analyzing health communication through Facebook. *Journal of Community Health*, *41*(1), 174–179.

Jimeno-Almazán, A., Pallarés, J. G., Buendía-Romero, Á., Martínez-Cava, A., Franco-López, F., Sánchez-Alcaraz Martínez, B. J., Bernal-Morel, E., & Courel-Ibáñez, J. (2021). Post-COVID-19 syndrome and the potential benefits of exercise. *International Journal of Environmental Research and Public Health*, *18*(10), 5329.

Jones, L. (2019). Collaborative governance in risk management. *Journal of Emergency Management*, *17*(6), 401–404.

Kabir, S. M. S. (2016). Methods of data collection. In *Basic guidelines for research: An introductory approach for all disciplines* (pp. 201–275). Book Zone Publication.

https://www.researchgate.net/publication/325846997_METHODS_OF_DATA_COLLECTION"

Kasperson, R. E., & Kasperson, J. X. (1996). The social amplification and attenuation of risk. *The Annals of the American Academy of Political and Social Science*, *545*(1), 95–105.

Khan, Y., O'Sullivan, T., Brown, A., Tracey, S., Gibson, J., Généreux, M., Henry, B., & Schwartz, B. (2018). Public health emergency preparedness: A framework to promote resilience. *BMC Public Health*, *18*(1), 1344.

Kim, Y., & Zhong, Y. (2020). Political ideology and effective risk communication on social media during the COVID-19 pandemic. *Journal of Risk Research*, *23*(7–8), 877–886.

King James Bible. (2017). King James Bible Online. https://kingjamesbibleonline.org/ (Original work published 1769).

Kosinski, M., Matz, S., Gosling, S., Popov, V, & Stillwell, D. (2016). Facebook as a research tool. *American Psychological Association*, *47*(3).

Krippendorff, K. (2004). *Content analysis: An introduction to its methodology* (2nd ed.). Sage Publications.

Krippendorff, K. (2013). *Content analysis: An introduction to its methodology* (3rd ed.). Sage Publications.

Kushner, J. (2022, October 21). *The role of social media during a pandemic*. Khoros. https://khoros.com/blog/social-medias-role-during-covid-19

Li, Y., Zhou, W., Yang, L., & You, R. (2020). Physiological and pathological regulation of ACE2, the SARS-CoV-2 receptor. *Pharmacological Research*, *157*. https://doi.org/10.1016/j.phrs.2020.104833

Liu, B., Zhang, L., & Liu, L. (2012). *Sentiment analysis: Mining opinions, sentiments, and emotions*. Cambridge University Press.

Local Public Health Reorganization Act, 2 Health and Safety Code § 121.001 (1989). https://statutes.capitol.texas.gov/Docs/HS/htm/HS.121.htm

Luhmann, N. (1979). *Trust and power*. Wiley.

McEntire, D. A. (2007). *Introduction to homeland security: Understanding terrorism with an emergency management perspective*. Wiley.

McEntire, D. A. (2015). *Disaster response and recovery: Strategies and tactics for resilience*. John Wiley & Sons.

McIvor, D. W. (2019). Toward a critical theory of collaborative governance. *Administrative Theory & Praxis*, *42*, 501–516.

Meta. (n.d.). *Facebook: Our story*. https://about.fb.com/company-info/

Milmo, D., & Pegg, D. (2021, October 25). Facebook admits site appears hardwired for misinformation, memo reveals. *The Guardian*. https://www.theguardian.com/technology/2021/oct/25/facebook-admits-site-appears-hardwired-misinformation-memo-reveals

Moreland, A., Herlihy, C., Tynan, M. A., Sunshine, G., McCord, R. F., Hilton, C., Poovey, J., Werner, A. K., Jones, C. D., Fulmer, E. B., Gundlapalli, A. V., Strosnider, H., Potvien, A., Garcia, M. C., Honeycutt, S., & Baldwin, G. (2020). Timing of state and territorial COVID-19 stay-at-home orders and changes in

population movement — United States, March 1–May 31, 2020. *Morbidity and Mortality Weekly Report*, *69*(35), 1198–1203. https://doi.org/10.15585/mmwr.mm6935a2

National Association of Counties. (n.d.). Coronavirus disease 2019 (COVID-19): County response efforts survey. https://www.naco.org/coronavirus-disease-2019-covid-19-county-response-efforts-survey

Neuendorf, K. A. (2016). *The content analysis guidebook* (2nd ed.). Sage Publications.

Northouse, P. G. (2013). *Leadership: Theory and practice*. Sage Publications.

Nsubuga, P., White, M. E., Thacker, S. B., Anderson, M. A., Blount, S. B., Broome, C. V., Chiller, T. M., Espitia, V., Imtiaz, R., Sosin, D., Stroup, D. F., Tauxe, R. V., Vijayaraghavan, M., & Trostle, M. (2006). Public health surveillance: A tool for targeting and monitoring interventions. In D. T. Jamison, J. G. Breman, A. R. Measham, G. Alleyne, M. Claeson, D. B. Evans, P. Jha, A. Mills, & P. Musgrove (Eds.), *Disease control priorities in developing countries* (2nd ed., pp. 997–1018). Oxford University Press.

Office of the Surgeon General. (2021). *Confronting health misinformation: The U.S. Surgeon General's advisory on building a healthy information environment*. https://www.hhs.gov/surgeongeneral/priorities/health-misinformation/index.html

Oh, O., Eom, C., & Rao, H. R. (2015). Research note: Role of social media in social change: An analysis of collective sense making during the 2011 Egypt revolution. *Information Systems Research*, *26*(1), 210–223. http://www.jstor.org/stable/24700080

Olmstead, K., & Barthel, M. (2015, March 26). *The challenges of using Facebook for research*. Pew Research Center. https://www.pewresearch.org/fact-tank/2015/03/26/the-challenges-of-using-facebook-for-research/#:~:text=The%20challenges%20of%20using%20Facebook%20for%20research%20By,to%20hear%20about%2C%20discuss%20and%20share%20local%20news

Ostrom, E. (2010). Analyzing collective action. *The Journal of the International Association of Agricultural Economists*, *41*(s1), 155–166. https://doi.org/10.1111/j.1574-0862.2010.00497.x

O'Toole, L. J. (2000). Research on policy implementation: Assessment and prospects. *Journal of Public Administration Research and Theory*, *10*, 263–288.

O'Toole, L. J., & Meier, K. J. (2017). Collaborative public management: Where have we been and where are we going? *American Review of Public Administration*, *47*(2), 155–172.

Paek, H., & Hove, T. (2017). *Risk perceptions and risk characteristics*. Oxford University Press. https://doi.org/10.1093/ACREFORE/9780190228613.013.283

Pang, B., & Lee, L. (2008). Opinion mining and sentiment analysis. *Foundations and Trends in Information Retrieval*, *2*(1–2), 1–135.

Pannucci, C. J., & Wilkins, E. G. (2010). Identifying and avoiding bias in research. *Plastic and Reconstructive Surgery*, *126*(2), 619–625. https://doi.org/10.1097/PRS.0b013e3181de24bc

Pantic, I., Damjanovic, A., Todorovic, J., Topalovic, D., Bojovic-Jovic, D., Ristic, S., & Pantic, S. (2012). Association between online social networking and depression in

high school students: Behavioral physiology viewpoint. *Psychiatria Danubina*, *24*(1), 90–93.

Parmet, W. E. (1992). Colonial public health. *American Journal of Public Health*, *82*(10), 1434–1441.

Paulik, L. B., Keenan, R. E., & Durda, J. L. (2020). The case for effective risk communication: Lessons from a global pandemic. *Integrated Environmental Assessment and Management*, *16*(5), 552–554. https://doi.org/10.1002/ieam.4312

Perrin, A., & Anderson, M. (2019, April 10). *Share of U.S. adults using social media, including Facebook, is mostly unchanged since 2018*. Pew Research Center. https://www.pewresearch.org/short-reads/2019/04/10/share-of-u-s-adults-using-social-media-including-facebook-is-mostly-unchanged-since-2018/

Pestronk, R. M., Elligers, J. J., & Laymon, B. (2013). Public health's role: Collaborating for healthy communities. *Health Progress*, *94*(1), 20–25.

Pomeranz, J. L., Zellers, L., Bare, M., Sullivan, P. A., & Pertschuk, M. (2019). State preemption: Threat to democracy, essential regulation, and public health. *American Journal of Public Health*, *109*(2), 251–252.

Porter, R. (1999). *The greatest benefit to mankind: A medical history of humanity*. Norton.

Quigley, W. P. (1995). *Work or starve: Colonial American poor laws*. Loyola University New Orleans College of Law Research Paper. https://ssrn.com/abstract=3506900

Ravi, K., & Durvasula, S. (2016). A survey on opinion mining and sentiment analysis: Tasks, approaches, and applications. *Science Direct*, *89*, 14–46.

Renn, O. (2004). Perception of risks. *Toxicology Letters*, *149*(1–3), 405–413.

Renn, O., Burns, W. J., Kasperson, J. X., Kasperson, R., & Slovic, P. (1992). The social amplification of risk: Theoretical foundations and empirical applications. *Journal of Social Issues*, *48*(4), 137–160.

Rianto, A., & Pratama, A. (2021). Sentiment analysis of COVID-19 vaccination posts on Facebook in Indonesia with Crowdtangle. *Journal Riset Informatika*, *3*(4), 353–362. https://doi.org/10.34288/jri.v3i4.282

Rose, D. A., Murthy, S., Brooks, J., & Bryant, J. (2017). The evolution of public health emergency management as a field of practice. *American Journal of Public Health*, *107*(S2), S126–S133.

Schoonenboom, J., & Johnson, R. B. (2017). How to construct a mixed methods research design. *Kolner Zeitschrift fur Soziologie und Sozialpsychologie*, *69*(Suppl. 2), 107–131. https://doi.org/10.1007/s11577-017-0454-1

Shapiro, I. (2020). State police powers and the constitution. CATO Institue. https://www.cato.org/pandemics-policy/state-police-powers-constitution

Shearer, E., & Matsa, K. E. (2018, September 10). *News use across social media platforms 2018*. https://www.pewresearch.org/journalism/2018/09/10/news-use-across-social-media-platforms-2018/

Slovic, P. (1987). Perception of risk. *Science*, *236*(4799), 280–285.

Slovic, P. (2000). *The perception of risk*. Earthscan Publications.

Stake, R. E. (1995). *The art of case study research*. Sage Publications.

Tehranian, M. (1979) Communication and international development – some theoretical considerations, *Media Asia*, *6*(3), 157–160, https://doi.org/10.1080/01296612.1979.11725974

Texas Department of State Health Services. (n.d.-a). *About DSHS*. https://www.dshs.texas.gov/About-DSHS/

Texas Department of State Health Services. (n.d.-b). *Public health regions*. https://www.dshs.texas.gov/regions/

Texas Department of State Health Services. (n.d.-c). *Texas local public health organizations*. https://dshs.texas.gov/regions/state.shtm

Texas Department of State Health Services. (2023). Public health regions [View: Map]. https://www.dshs.texas.gov/sites/default/files/regions/Texas-Local-and-Regional-Public-Health-Coverage-Map.pdf

Texas Public Law. (1989a). Indigent Health Care and Treatment Act. https://statutes.capitol.texas.gov/Docs/HS/htm/HS.61.htm

Texas Public Law. (1989b). Local Public Health Reorganization Act. https://statutes.capitol.texas.gov/Docs/HS/htm/HS.121.htm

Turnock, B. J. (2015). *Public health: What it is and how it works* (6th ed.). Jones & Bartlett Learning.

Tyson, A., & Funk, C. (2022, February 9). *Increasing public criticism, confusion over COVID-19 response in U.S.* Pew Research Center. https://www.pewresearch.org/science/2022/02/09/increasing-public-criticism-confusion-over-covid-19-response-in-u-s/

U.S. Census Bureau. (2021a). QuickFacts: Cameron County, Texas. https://www.census.gov/quickfacts/cameroncountytexas

U.S. Census Bureau. (2021b). QuickFacts: Hidalgo County, Texas. https://www.census.gov/quickfacts/hidalgocountytexas

U.S. Department of Education. (2006). *The National Incident Management System (NIMS)*. Emergency Response and Crisis Management Technical Assistance Center. https://rems.ed.gov/docs/NIMS.pdf#:~:text=Established%20on%20March%201%2C%202004%2C%20by%20Homeland%20Security,carry%20out%20responses%20to%20a%20variety%20of%20incidents

U.S. Department of Health and Human Services. (n.d.). The incident command process. https://www.phe.gov/Preparedness/planning/mscc/handbook/chapter1/Pages/theincidentcommand.aspx

U.S. Department of Health and Human Services. (2018). *Expedited review: Categories of research that may be reviewed through an expedited review procedure (1998)*. https://www.hhs.gov/ohrp/regulations-and-policy/guidance/categories-of-research-expedited-review-procedure-1998/index.html

U.S. Department of Homeland Security. (2019). *National response framework. Fourth edition*. https://www.fema.gov/sites/default/files/2020-04/NRF_FINALApproved_2011028.pdf

Vielot, N. A. (2014). Bridging the divide between emergency management and public health preparedness. *Disaster Medicine and Public Health Preparedness*, *8*(4), 291–292.

Watson, C. R., Watson, M., & Sell, T. K. (2017). Public health preparedness funding: Key programs and trends from 2001 to 2017. *American Journal of Public Health*, *107*(S2), S165–S167.

Wihbey, J. (2015, October 18). *How does social media use influence political participation and civic engagement? A meta-analysis*. https://journalistsresource.org/politics-and-government/social-media-influence-politics-participation-engagement-meta-analysis/

Wilkins, C., Mapes, B., Jerome, R., Villalta-Gil, V., Pulley, J. M., & Harris, P. A. (2019). Understanding what information is valued by research participants, and why. *Health Affairs*, *38*(3). https://doi.org/10.1377/hlthaff.2018.05046

Wong-Parodi, G., & Feygina, I. (2021). Engaging people on climate change: The role of emotional responses. *Environmental Communication*, *15*(5), 571–593. https://doi.org/10.1080/17524032.2020.1871051

World Health Organization. (n.d.-a). *Coronavirus disease (COVID-19)*. https://www.who.int/health-topics/coronavirus#tab=tab_1

World Health Organization. (n.d.-b). *Infectious diseases*. https://www.who.int/teams/integrated-health-services/clinical-services-and-systems/surgical-care/infectious-diseases

World Health Organization. (n.d.-c). *Risk communications and community engagement (RCCE)*. https://www.who.int/emergencies/risk-communications

World Health Organization. (2020a). *The COVID-19 risk communication package for healthcare facilities*. https://www.who.int/docs/default-source/epi-win/health-workers/risk-communication-package-for-healthcare-facilities.pdf

World Health Organization. (2020b). *Report of the WHO-China Joint Mission on coronavirus disease 2019 (COVID-19)*. https://www.who.int/docs/default-source/coronaviruse/who-china-joint-mission-on-covid-19-final-report.pdf

World Health Organization. (2021). WHO pandemic definition. https://www.publichealth.com.ng/world-health-organization-who-pandemic-definition/

Yin, R. K. (1994). *Case study research: Design and methods*. Sage Publications.

Yin, R. K. (2003). *Case study research: Design and methods* (3rd ed.). Sage Publications.

Yin, R. K. (2014). *Case study research: Design and methods* (5th ed.). Sage Publications.