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Planning for Continuity of Services: A Comprehensive Strategic Assessment Model for Healthcare Business Continuity Planning

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PLANNING FOR CONTINUITY OF SERVICES: A COMPREHENSIVE STRATEGIC ASSESSMENT MODEL FOR HEALTHCARE BUSINESS CONTINUITY PLANNING

By

Jordan Joseph Bradway

A doctoral project submitted to the faculty of the Medical University of South Carolina in partial fulfillment of the requirements for the degree Doctor of Health Administration in the College of Health Professions.

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Abstract of Doctoral Project Presented to the
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Degree of Doctor of Health Administration

Planning for Continuity of Services: A Comprehensive Strategic Assessment Model for Hospital Business Continuity Planning

By

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With the release of the 2016 Centers for Medicare and Medicaid Services' (CMS) requirements for healthcare institutions to implement business continuity planning into their organizations by November 15, 2017, the focus of business continuity and disaster recovery planning solely for information services has now transitioned into an enterprise-wide requirement. Over the past decade, there have been increasing numbers of naturally occurring and man-made disasters that have significantly interrupted or altogether closed healthcare facilities, impacting the health and well-being of entire communities. This study examines the changing regulatory landscape that requires healthcare institutions to develop, maintain, and regularly test their business continuity plans in an effort to enhance their operational resiliency. After a retrospective review of regulations, guidelines, and best practices, this study pilots an addition to the Kaiser Permanente hazard vulnerability assessment (HVA) tool that is intended to enable healthcare organizations to objectively identify, prioritize, and maintain their business continuity and emergency management planning efforts through the identification of potential operational and financial impacts to healthcare facilities during and following disasters. The major benefits of this study are to identify the historical shortcomings of a healthcare facility's hazard and risk identification processes and to facilitate the use of the information collected during that process. Identified inadequacies from past healthcare preparedness efforts will be used to form new meaningful

efforts to enhance the recognition of risks to healthcare organizations, in an effort to enhance their resiliency to interruptions of services and to minimize financial losses during austere events.

TABLE OF CONTENTS

List of Tables……

List of Figures……..

CHAPTER 1

INTRODUCTION

Background and Need

For more than a decade, a large number of man-made and naturally occurring disasters have devastated entire communities. Several of these disasters have crippled or destroyed healthcare facilities, leading to a disruption of healthcare services within those communities (Leonard, 2006). Hospitals and other healthcare facilities are part of the critical infrastructure within a community, making their existence and operational capabilities necessary to maintain the health of the population. For this reason, maintaining the operational resilience and financial viability of healthcare facilities during man-made or naturally occurring disasters is an important part of a community's overall well-being (World Health Organization, 2008).

The existing tools for prioritizing hazards and vulnerabilities have been ineffective at engaging healthcare institution executives in the planning and physical mitigation efforts. The below table summarizes the current tools available to hospitals and health systems to utilize in determining risks to their operations and overall resiliency (Braun B, 2006).

As interruptions of healthcare services due to man-made and naturally occurring disasters continue to increase in frequency and severity, more effective risk identification and prioritization tools are needed to advert these hazards from interrupting healthcare operations. The purpose of the hazard identification and risk assessment tools is to prioritize and to address the impact that various hazards could have on a healthcare facility (Centers for Medicare & Medicaid Services, 2017).

The Joint Commission (TJC) and Centers for Medicare and Medicaid Services (CMS) does not recommend a method or tool to determine risks and hazards to healthcare institutions; however, the term "Hazard and Vulnerability Assessment" has been frequently used in Joint Commission regulatory manuals and guidance (Braun B, 2006). One of the most commonly used tools is the Kaiser Permanente

HVA tool. This tool, along with the University of California Los Angeles' (UCLA) Hazard Risk Assessment Instrument, provides the framework for many healthcare organizations' hazard assessments.

Since the terrorist attacks of September 11, 2001, the Centers for Medicare and Medicaid Services (CMS) have implemented various executive orders and legislative acts to outline the expectations that CMS has for healthcare providers and suppliers regarding their roles in a unified emergency preparedness system with community partners.

Healthcare organizations need to remain operational before, during, and after disasters. To enhance the level of hazard planning conducted by healthcare organizations, CMS released the "Final Rule" on September the 8, 2016. The "Final Rule" mandate is officially referred to as the Medicare and Medicaid Programs' "Emergency Preparedness Requirements for Medicare and Medicaid Participating Providers and Suppliers Final Rule." The Final Rule "focuses on three key essentials necessary for maintaining access to healthcare during disasters or emergencies: safeguarding human resources, maintaining business continuity, and protecting physical resources" (Centers for Medicare & Medicaid Services, 2017). This rule is meant to create consistent emergency preparedness requirements for the seventeen different healthcare facility provider types that receive funding from Medicare and Medicaid programs. It is understood that there are unique differences among healthcare facilities and their patients; however, the guidelines set forth by CMS were developed as a standard to cover all hazards/disasters while still addressing the differences in all settings. The assumption of these CMS requirements is intended to create appropriate planning and coordination with local agencies prior to and following a disaster.

This new mandated effort is meant to bolster emergency planning coordination, response and recovery efforts among healthcare facilities and other critical community services during disasters, while meeting the intended outcome of the Final Rule. The release of the Final Rule was prompted by identified inadequacies of healthcare facilities to continue to provide needed health services during and immediately following disasters. The three main inadequacies identified by healthcare facilities were communication, contingency planning, and training of personnel (CMS, 2016).

Since the release of the new CMS rule, the leadership within healthcare facilities are striving to develop capabilities to maintain higher levels of operational resiliency during austere events. Sustaining access to healthcare and delivery of health services at normal operating capacities will ensure that healthcare facilities are able to maintain continuity of operations and business processes through enterprise-wide coordinated planning efforts. Due to the recent release of these new regulations, the adherence to the new regulations has not yet been determined.

The objective of developing and maintaining higher levels of operational resiliency for healthcare organizations is aimed at sustaining access to healthcare at normal pre-disaster operating capacities. To ensure new emergency preparedness regulations are being followed, the new guidelines were incorporated into the CMS Conditions of Participation (CoPs), Conditions for Coverage (CoCs) and Conditions for Certification, meaning that the payments to healthcare facilities from CMS would be withheld, for those organizations that were found to not be adhering to the new regulations (Centers for Medicare & Medicaid Services, 2017). The governance and enforcement of these new federal regulations of healthcare facilities are to be carried out by the CMS and recognized healthcare accrediting agencies, such as The Joint Commission (TJC).

Many healthcare organizations and other Medicare/Medicaid participants prior to the release of the Final Rule of November 15, 2017, had not previously considered the operational interruption(s) of various services during a disaster in the detail that is needed, thus leaving providers financially and operationally vulnerable. Since the rollout of the Final Rule by CMS, healthcare entities have been given guidance through CMS and the Assistant Secretary of Preparedness and Readiness (ASPR) as to what defines business continuity planning and what goes into having a successful business continuity plan (BCP). Since the mandate was implemented in November 15, 2017, the the efforts required from healthcare executives in business continuity planning remain unclear.

Business continuity planning

Business continuity involves in-depth planning and coordination to enable an organization's success, especially during disasters, when the demand for health services increases and the capacity to

offer those services decreases. Business Continuity Planning (BCP) is defined as "plans, procedures, and resources to maintain and/or recover mission-critical processes and services impacted by an event causing an interruption of normal healthcare delivery operations" (Devlen, 2017). In addition to maintaining and recovering from austere events, BCP incorporates identification and mitigation strategies from risks such as cyber-attacks, human error, technological failures, and naturally occurring disasters. While previous considerations of operational interruption(s) were primarily focused on information services and technological failures, the new all encompassing approach of healthcare facilities towards business continuity planning is changing how healthcare organizations go about planning to increase their resiliency. The trend of combining business continuity and disaster recovery into a single term has resulted from a growing recognition that business and technology executives need to collaborate closely instead of developing plans in isolation (Target, 2017).

Organizations that postpone business continuity planning are essentially operating in a reactive mode and devising “on-the-fly” plans to correct interruptions to services as they occur. BCP allows organizations the opportunity to continually improve their operations while decreasing the risk of harm to operational and financial impacts from various threats such as cyber-attacks, human error, technological failures, and natural disasters.

The healthcare industry has not embraced enterprise-wide business continuity planning at the same level as government non-healthcare entities. Only after Congress passed the 1996 Health Insurance Portability and Accountability Act (HIPAA), did healthcare organizations begin to implement business continuity and disaster recovery planning into their organizations. In the past two decades since the introduction of HIPPA, business continuity planning in healthcare predominantly focused on the information services aspect of the business (Target, 2017). In the years following 1996, regulatory requirements of business continuity and disaster recovery were focused primarily on maintaining and securing protected healthcare information, as well as ensuring redundancies for the continual access to electronic health records (EHRs).

With communities and healthcare institutions continuing to experience a significant increase in the frequency and intensity of weather-related storms and the escalation of technological threats, a more proactive approach towards the creation of plans, procedures, and resources is needed. The goal of healthcare institutions should be to make mission-critical services more resilient to any austere event that may cause an interruption to normal healthcare operations. The magnitude that a disruption could have on a healthcare organization's operations is still not something that is evaluated or determined by healthcare facilities, leaving potential gaps in continuity planning efforts. Figure 1 illustrates the equation used to determine the severity of a hazard, by subtracting mitigation efforts from the magnitude of the hazard to arrive at the severity score (Campbell, 2011).

Figure 1. Hazard Severity Equation

(Kaiser Permanente, 2017)

The bigger the vulnerability, the bigger the impact natural or man-made disasters will have on the healthcare facility. The identification and classification of the various vulnerabilities are the initial steps for healthcare providers before they can determine the toll the hazard will have on the infrastructure and operating capacities for the healthcare facility. After the vulnerabilities are identified and their potential risk(s) to the organization known, prioritization of those identified risks to the facility can be made. The prioritization of vulnerabilities and risks to organizations helps develop mitigation strategies to minimize or eliminate the risks to the organization. Figure 2 illustrates the calculation to determine the relative risk; which is the identified hazard multiplied by the identified vulnerabilities (Campbell, 2011).

Figure 2. Relative Risk Equation

(Kaiser Permanente, 2017)

As healthcare reform continues to evolve, providers continue to struggle to meet the heavy demand and costs of emergency care; this demand becomes exacerbated by large-scale disasters. Without the ability to continue health services, insufficient capacities and financial reserves may force hospitals to permanently close or curtail services. The integration of disaster risk reduction planning and construction into current and future healthcare strategies will be critical to protecting the operations and overall well-being of healthcare organizations. Additionally, coordination with and integration of community emergency managers and emergency responders into healthcare emergency planning and risk reduction efforts will help promote a state of resiliency for healthcare services.

The ability to continue critical services during an emergency or austere event can be defined as "a healthcare facility's ability to resist, absorb, and respond to an austere event while maintaining its critical health care functions, and then recover to its original state or adapt to a new one" (CMS, 2016). The newly released regulations require that hospitals embrace an all-hazards emergency management program, which includes mitigation, preparedness, response, and recovery strategies to improve the overall readiness of hospitals for man-made or naturally occurring austere events.

Problem Statement

Changes included in the new CMS requirements, include member hospitals completing an annual risk assessment or hazard vulnerability analysis (HVA) (Centers for Medicare & Medicaid Services, 2017). This annual requirement of conducting an HVA is an attempt to measure the risk that

man-made, naturally occurring, or technological hazards may have on a healthcare facility. The KP-HVA and other risk scoring tools incorporate various scoring methodologies in determining the relative threat or risk scores, which are presented as percentages. The higher the percentages, the higher the risk to the organization; thus the hazards with the highest risk percentages are identified as the top hazards. The calculated scores are intended to prioritize and guide the healthcare organization in emergency planning and in correlating mitigation efforts for their facility. When this new requirement was released, there was no tool or guidance provided to healthcare organizations on how to complete this requirement. With the lack of guidance to complete this task, several healthcare organizations have devised their own tools and scoring metrics. This lack of guidance has led to confusion and uncertainty of healthcare organizations. The true priorities of threat, vulnerability, and risk remain unclear to many healthcare leaders. Furthermore, the multiple tools and scoring metrics have led to the underutilization of the HVA data at the hospital or community level (Toner, 2018).

To date, the majority of research has retrospectively examined the impact of disasters on the inpatient setting and the ability to recover post-disaster (Radcliff, 2018). While there are many guidelines and commentaries related to how healthcare organizations should prepare and recover from disasters, few studies have examined the effectiveness and feasibility of hazard planning tools.

Given the newness of the regulations, there is a limited evidence-base and resources available to organizations. There are two aims of this study. First, the study evaluates existing recommendations and frameworks for the identification, prioritization, and reduction of risks and vulnerabilities to healthcare operations and financial well-being before, during and after disaster events. Data sources will include government regulatory guidance, incident debriefs, journals, white papers, subject matter expert analysis, surveys, peer identified best practices, and identified concerns.

Next using data from one health care organization, the study pilots a new tool for identifying and prioritizing business continuity planning efforts for healthcare systems or facilities, by using potential financial losses from interruptions to operations. This tool will be used with four different healthcare provider types: Acute Care Hospital (ACH), Outpatient Center (OC), Skilled Nursing Facility (SNF) and

Medical Office Building (MOB). This tool will be used in conjunction with the KP-HVA tool that is used by the majority of healthcare organizations to determine the current risk levels of their facilities. Research has supported the need for the inclusion of business continuity planning considerations and projecting financial and operational impacts that identified hazards can have on healthcare organizations. The inclusion of this quantitative data is intended to enhance healthcare resiliency planning as well as the role healthcare leadership plays in this planning (Toner, 2018).

A potential benefit of this tool is the ability for healthcare systems and individual facilities to better understand their loss of revenue and additional disaster-related expenses when the facility is unable to operate. Additionally, the tool is meant to involve leadership in resiliency planning, by providing operational and financial risks of hazards to the facility. Finally, understanding possible financial losses during disasters will help healthcare executives make informed decisions when determining facility operations, insurance amounts, business interruption insurance amounts, and mitigation measures which will allow a more financially secure facility (Stryckman, 2015).

Research Questions

1. What are the benefits for healthcare organizations to prioritize business continuity efforts within their organization to meet and/or exceed regulatory requirements?
2. Can the addition of a quantifiable financial scoring tool into the existing KP-HVA tool, calculate potential financial losses to healthcare organizations during a disruption of services?
3. How can healthcare organizations utilize the length of disruption and financial impacts from hazards to develop fiscal management policies and protocols?

CHAPTER 2

LITERATURE REVIEW

Methods

The collection of literature took place over six months, starting in August of 2017. The literature review began with keywords related to business continuity in healthcare in several academic and government databases. The inclusion criteria included literature from 2001 to present day. The terrorist attacks on September 11, 2001, were the events that prompted a nationwide call to enhance preparedness, response, mitigation, and recovery, in the healthcare industry. During 2001, the founding framework and requirement of healthcare facilities to identify and prioritize risks were established (Osman Dar, 2014). The prioritization of reviewed literature was given to peer-reviewed journals, as this is the basis of the data to be collected. A scoping review was also performed in order to provide an overview of the type, extent, and quality of information available regarding emergency management disaster planning and business continuity planning within various healthcare organizations.

Searches for related documents were queried using the Medical University of South Carolina's online library, primarily the PubMed portal. The databases were searched using the terms "healthcare business continuity," “healthcare risk assessments,” and "healthcare resiliency." Additional searches utilized professional organization websites, government-sponsored data sharing repositories and mainstream search engines to determine published regulatory guidance documents, white papers, and historical documents. The terms used for searching for related information included "healthcare resiliency," "healthcare business continuity," "healthcare disaster recovery," “healthcare risk assessments,” and "healthcare continuity of operations."

Articles were selected for review if the query terms were identified in the title or the abstract of the article within the given published timeframes. Articles that focused on healthcare outside of the United States were included. Countries outside of the United States were included because of their similar struggles with healthcare resiliency following disasters, while some countries, most notably

Australia have a robust framework of guidance for healthcare business continuity. Each of the articles was reviewed for related context to the topic of business continuity and/or continuity of operations in healthcare. These scoping reviews highlighted the way healthcare organizations maintain their operations at a minimum operating level before, during and after a man-made or natural disaster.

Background

With the changes to the federal emergency preparedness mandates in 2016 for certain healthcare entities that receive funding from the CMS, there is little existing framework in place for business continuity planning and guidance in the healthcare sector. As part of the conditions of participation (COP), CMS is now mandating that certain healthcare providers create, sustain, and exercise a continuity of operations plan (COOP) on an annual basis (CMS, 2017). This new mandate took effect on November 15, 2017, and thus healthcare organizations rushed to find guidance, literature and comprehensive templates to meet this need (McCarthy, Brewster, Hsu, Macintyre, & Kelen, 2017).

With virtually everyone requiring some aspect of healthcare throughout their lives, the community's dependency on healthcare services makes the overall resiliency of the healthcare provider an important aspect of the overall well-being of a community (Horowitz, 2017). The identification of risks and vulnerabilities that may impact a healthcare facility's ability to continue critical health services is an important part of ensuring the resiliency of that healthcare facility. Vulnerabilities and risks that are not identified leave the healthcare organizations subject to unforeseen consequences that may damage or limit their capacity to render services during a disaster. While many risks or vulnerabilities may be difficult to completely eliminate, mitigation and planning may reduce these risks and vulnerabilities to more acceptable levels. The identification and prioritization of vulnerabilities and risks to the organization aid in the formation of mitigation and planning efforts to reduce the impacts those vulnerabilities will have on the organization (Spiekermann, Kienberger, Norton, Briones, & Weichchselgartner, 2015).

As the United States' healthcare industry continues to see economic changes, organizations are being confronted with daily financial challenges due to the new landscape in healthcare economics. The General Accountability Office's report on emergency preparedness, planning, and efforts released their findings of "State officials reported that it was difficult to continue to engage private-sector hospital chief executive officers in emergency preparedness activities at a time when these hospitals were facing day-to-day financial problems" (United States Government Accountability Office, 2008, pp. 22-23). Healthcare executives and clinical leadership are entrusted to protect the financial well-being of their hospitals, so the use of funds without an immediate return on investment or a well-understood benefit to the hospital is often viewed with disdain (Stryckman, 2015).

The risk perception of healthcare decision makers may also be negatively affected by the traditional HVA, which is completed annually. The presentation of identified top hazards without additional definition and meaning to healthcare executives leads to confusion on needed next steps. Without a clear outline of how those hazards could impact an organization, leaders have difficulty visualizing the potential impacts on the organization. A standard HVA primarily ranks hazards in their order of priority, instead of emphasizing the elements of vulnerability that would be better addressed to achieve true risk reductions (Osman Dar, 2014).The standard KP-HVA does not elaborate on operational or financial impacts that the ranked hazards could have on the organization and often lacks the needed information to engage leadership.

Further complications to the decision makers' decision is the uncertainty of the legal community in regard to emergency preparedness activities. There are few precedents for the liability of healthcare providers' identifying risks to their facilities, regulatory compliance, and poor outcomes during disasters. The uncertainty of these issues creates precarious views on openly identifying the risks and vulnerabilities of the organization (Ransom, 2008).

Impact of Disasters on the U.S. Healthcare Systems

During a disaster, health facilities face closure, destroyed or damaged physical assets, displaced workforces and patients, as well as a chaotic operational revenue cycle. Once the event is over, facilities face possible reduced operations, capital limitations, and credit downgrades (Arain, 2015).

The often immediate and unplanned reduction of services or the complete closure of a healthcare facility following a disaster, particularly in rural communities, creates both short-term and long-term health, social and economic impacts to a community. Even when outages last only a few hours, there is still a large financial impact that the healthcare organization incurs. For example, "one hour of electronic health record [EHR] downtime can cost a practice almost $488.00 per physician, per hour for the duration of the outage. It is estimated that the impact is approximately $43,000/00 per day for a large physician practice or a hospital unit" (Devlen, 2017 pg. 5).

As disasters continue to impact healthcare systems throughout the United States with greater ferocity and frequency, there are a few disasters that stand out as "iconic" disasters that changed both the focus and regulatory landscape of healthcare preparedness. Hurricane Katrina of 2005, Super Storm Sandy of 2012, and Hurricane Harvey of 2017 were three storm systems that stand out as especially devastating to the healthcare community, causing both immediate and long-term impacts to multiple healthcare organizations in the three storms' paths.

Healthcare organizations are not alone in experiencing post-disaster hardships; the health of the community as whole experiences adverse impacts from interruptions in health services, and this is especially true for those with chronic diseases (Icenogle, 2016). Patients with chronic diseases such as diabetes, human immunodeficiency virus, hypertension, and renal failure face an increase in mortality rates following disasters to this day, even after these medically fragile populations were identified back in 2004 during Hurricane Katrina (Icenogle, 2016).

With the interruption and/or closure of healthcare organizations and ancillary healthcare organizations, (i.e. pharmacies, dialysis clinics etc.) there have been seen consistent increases in

mortality and morbidity rates in communities following a disaster (Lin, 2014). Interruptions in healthcare services lead to a downfall in the overall health of the impacted community. Hospitals often see a pronounced increase in demand during disasters, due to the closures of other community health and specialty care services, such as dialysis (Lin, 2014). Following significant disasters some healthcare facilities struggle to stay open, let alone be effective. Future of facilities to remain operational shifts the burden of providing health services to the community to other surrounding area healthcare organizations that are still operational.

In addition to interruptions in providing services to the public, healthcare facilities have to contend with the immediate and often long-term financial struggles following a disaster. After Hurricane Harvey, the most costly natural disaster in the United States to date, the Texas Hospital Association surveyed its members impacted by Harvey. The disaster-related costs across the 92 hospitals were estimated to be $460 million. Of the $460 million, $380 million was for operating expenses and emergency work, $40 million for uncompensated care costs, and $40 million in other increased operating expenses (Sanborn, 2017).

Following disasters, healthcare facilities often report significant impacts to revenue and cash flow due to interruptions of billing and claim services, as well as from ancillary departments closing. In addition to interruptions in billing and filing claims, office closures, reduced hours of operation, canceled services, and decreased patient volumes all contribute to post-disaster financial stressors for organizations (Sanborn, 2017). An example of individual facility losses during a hurricane is that of Northwell Health in New York City, NY. Northwell Health reported a $13 million total loss during Hurricane Irene, with $4 million being attributed to labor and supplies and $9 million to revenue lost from hospital closures (Sanborn, 2017).

The aforementioned and unmentioned disasters of the past have all identified social and healthcare gaps in the impacted communities, with a continued need for education, planning, and mitigation efforts to minimize the impacts that disasters have on both healthcare facilities and the

medically fragile populations within the community (Centers for Disease Control and Prevention, 2011). The closures or diminished capacities of healthcare organizations due to financial and operational strain from these disasters are something that continues to occur, despite efforts to reduce risks and vulnerabilities of these organizations from disasters.

Disaster Planning Guidelines and Recommendations

The U.S. Department of Health and Human Services (HHS) Office of the Assistant Secretary for Preparedness and Response (ASPR) is responsible for the preparation, response, and recovery aspects of health services, following an emergency or disaster. ASPR is responsible for developing and guiding healthcare preparedness and response capability guidance for healthcare organizations and emergency responders; this guidance is associated with an annual healthcare preparedness grant that is administered through HHS-ASPR (Office of the Assistant Secretary for Preparedness and Response, 2017). ASPR, CDC, CMS, FEMA and other federal agencies jointly collaborate and release strategic planning every five years to enhance healthcare preparedness, as well as response and recovery capabilities of healthcare organizations throughout the United States and its territories.

ASPR's 2017-2022 release of capabilities outlines the following four capabilities:

- Capability 1: Foundation for Health Care and Medical Readiness
- Capability 2: Health Care and Medical Response Coordination
- Capability 3: Continuity of Health Care Service Delivery
- Capability 4: Medical Surge

The four capabilities are intended to provide a guiding light for healthcare organizations to focus their efforts on creating and sustaining these capabilities in order to enhance their preparedness and response efforts (Office of the Assistant Secretary for Preparedness and Response, 2017). Each of the capabilities mentioned above contains "objectives." The objectives and associated activities are what the healthcare organization should implement to enhance their capability.

The following capabilities, objectives, and activities highlight the current requirements for healthcare organizations. ASPR's guidance promotes a national focus on improving patient outcomes during emergencies that exceed the day-to-day capacities of health and emergency response systems. The purpose of the 2017-2022 HPP guidance is to incentivize diverse healthcare organizations with differing priorities and objectives to work together collaboratively to promote healthcare delivery system resilience in the aftermath of emergencies. The objectives and capabilities outline the ideal state of readiness in the United States.

Table 1: ASPR Healthcare Capabilities and Objectives for Facilities

Capability #	ASPR Healthcare Capability	Capability Objectives for Facilities
1	Foundation for Healthcare Medical Readiness	1. Establish and Operationalize a Healthcare Coalition 2. Identify Risk and Needs 3. Develop a Healthcare Coalition Preparedness Plan 4. Train and Prepare the Healthcare and Medical Workforce 5. Ensure Preparedness is Sustainable
2	Healthcare and Medical Response Coordination	1. Develop and Coordinate Healthcare Organization and Coalition Plans 2. Utilize Information Sharing Procedures and Platforms 3. Coordinate Response Strategy, Resources, and Communications
3	Continuity of Healthcare Delivery	1. Identify Essential Functions for Healthcare Delivery 2. Plan for Continuity of Operations 3. Maintain Access to Non-Personnel Resources during an Emergency 4. Develop Strategies to Protect Healthcare Information Systems 5. Protect Responders' Safety and Health 6. Plan for and Coordinate Healthcare Evacuation and Relocation 7. Coordinate Healthcare Delivery System Recovery
4	Medical Surge	1. Plan for a Medical Surge 2. Respond to a Medical Surge

Source: ASPR, 2017

Some of the objectives and activities within these four capabilities are particularly critical for health care hazard and disaster planning. "The goal of Capability 1 is to ensure that healthcare organizations collaborate with community stakeholders to identify hazards and risks, and to prioritize and address gaps through planning, training, exercising, and managing resources (Office of the Assistant Secretary for Preparedness and Response, 2017, p. 7). The primary focus of the activities in this section

is that healthcare facilities integrate into their communities emergency planning and response efforts, sharing identified hazards and risks to their community with one another.

Key objectives within Capability 1 include the completion of an annual HVA. This activity is meant to determine a healthcare facility's vulnerabilities related to naturally occurring, man-made, or technological hazards affecting the facility and operations. The facility should identify and prioritize their risks and vulnerabilities, while attempting to reduce those risks through mitigation measures (Office of the Assistant Secretary for Preparedness and Response, 2017, p. 13). Also under this capability, healthcare facility leadership should assess and identify regulatory compliance requirements that are applicable to normal operating levels, with the intention of enhancing planning for, responding to and recovering from disasters. Another activity in this stage is that healthcare facilities engage health care executives in reducing risk, and addressing facility and community needs before, during, and after disasters.

The goal of capability 3 is for healthcare facilities to provide uninterrupted, optimal medical care to all populations in the face of damaged or disabled health care infrastructure. Facilities should regularly train, exercise and prepare to meet the needs of their patients and community following a disaster. Response and recovery efforts should be completed simultaneously to expedite the return to normal operations (Office of the Assistant Secretary for Preparedness and Response, 2017). Under this capability, healthcare leadership teams are instructed to identify essential functions for healthcare delivery. Mission essential functions (MEFs) should identify and prioritize services to be restored following a disruption. Inpatient services, outpatient services, skilled nursing facilities, and other health care organizations should all be considered in this type of planning. Planning for continuity of services is both required and needed for healthcare organizations, to be resilient from disasters. Continuity of operations planning should include operational and financial planning during disasters and disruptions of normal operations. In addition, healthcare facilities should plan to be able to maintain operational and financial functions during and after an emergency or disaster. Essential business processes and financial security should be the basis of this

planning to allow the health care organization to resume the critical services of caring for the community which they serve in a timely manner.

Description and Background of Kaiser Permanente HVA tool

Following the attacks of September 11, 2001, nationwide emergency preparedness efforts were undertaken to enhance readiness for disasters. That year, the Joint Commission required healthcare organizations to complete an annual hazard vulnerability analysis or risk assessment as part of their triannual certification cycle. The purpose of this requirement was to provide a framework for hospitals to prioritize their emergency planning efforts (McCarthy, Brewster, Hsu, Macintyre, & Kelen, 2017). The American Society for Healthcare Engineering (ASHE) of the American Hospital Association created the first standard HVA tool, and the Kaiser Permanente tool expanded upon the guidance and scope of hazards that healthcare facilities should consider.

Emergency management preparedness and planning efforts rely on the assumptions made during their creation and annual reviews. Objective data, instead of opinions alone is needed to create a solid foundation for emergency planning and preparedness efforts. The Joint Commission defines HVA as "the identification of hazards and the direct and indirect effects these hazards may have on the hospital" (TJC, 2018).

This tool outlines various potential hazards that could impact a healthcare facility. There are four choices: N/A, Low, Moderate or High, to be determined by an inter-professional group of healthcare workers for each of the events or hazards listed in the tool. The tool starts with the scoring of the probability of the event occurring or having an impact on the facility. After determining the probability, the severity was determined by scoring the three impacts: human, property, and business. To complete the severity score, the three mitigation categories are scored: preparedness, internal response, and external response. The higher the mitigation scores, the less impact or relative threat the event would have on the facility. The basic calculation is outlined as Severity = (Magnitude-Mitigation), showing

that the magnitude score would be countered by the mitigation score. The final measurement combines the probability score and severity scores to determine the overall risk/relative threat score, which is represented as a percentage. After all the events are scored, the highest overall risk/relative threat scores would be the most hazardous to that particular facility (Toner, 2018).

The above outlined Kaiser Permanente HVA tool met the requirements of the Joint Commission and has since been adopted by the majority of healthcare organizations and non-healthcare emergency preparedness departments due to its ease of use and application across multiple different types of healthcare entities (Redwood-Campbell, 2011). One of the major outlined benefits of the KP-HVA is the incorporation of community organization factors and individual organizations into a combined tool.

The information that is calculated by utilizing this risk scoring methodology is often collected and filed in binders, awaiting regulatory audit(s). The intent of enhancing preparedness, planning, mitigation, and response efforts within a healthcare institution by the identification of hazards and risks that healthcare institutions may face is thus lost. While this tool identifies a facility's top hazards based on the scoring methodology and inputs, this tool does not capture the attention of healthcare leadership (Redwood-Campbell, 2011). Understanding and buy-in of leadership are needed to truly evoke a culture of disaster preparedness and continuity of operations despite disasters.

Other Hazard Identification Tools

While the Kaiser Permanente HVA is the most commonly used tool by healthcare providers, private and public sector agencies, there are numerous other tools that are designed to capture risk measurements and hazard identification. These tools all take a slightly different approach in calculating risks to an organization. While the majority of the tools used the KP-HVA tool as a guiding document to frame their variations in data collection and scoring methodologies, Table 2 illustrates the inconsistent nature of the current HVA process for healthcare organizations. Each tool produces slightly different scoring metrics, thereby increasing the risk for misunderstanding of results by the users and intended audiences.

Analysis of Commonly Used Risk and Hazard Scoring Tools

The most commonly used risk and hazard scoring tools have been collected; and have been identified with the intended purpose, calculation method, and limitations for each of the tools. The collected limitations in each of the tools have been analyzed to determine the reoccurring gaps in existing tools, and from this analysis the most commonly identified gaps have been incorporated into the proposed addition to the KP-HVA tool. The review of existing hazard identification and risk assessment tools confirms that there are no tools that produce a quantitative analysis of the potential financial losses that healthcare providers could incur during an interruption of services. The importance of this finding is that this is a key measure for healthcare executives to fully understand and take action to mitigate the risks and vulnerabilities that are identified by these tools to protect their operations and financial well-being. Additionally, the review of tools concludes that the majority of those in existence took their initial concept and guidance from the Kaiser Permanente HVA tool.

Table 2: Summary of Existing Healthcare Hazard Vulnerability Assessment Tools

Tool Name	Purpose	Calculations Approach	Limitations	Created by
Pennsylvania Public Health Risk Assessment Tool	To provide an analysis of health-related impacts of hazards that can occur. The tool helps planning efforts for those emergencies.	Risk-based on probability and impact severity. Measures five major domains.	Public Health Specific. Multiple sources or various users may skew data.	Drexel University School of Public Health. Based on adaptations of Kaiser Permanente's HVA tool.
Health Hazard Assessment and Prioritization	Assess and prioritize planning and mitigation efforts for hazards. Tool offers a health-focused mechanism to identify and improve an agency's capability to prepare, respond, and recover from potential threats.	Focuses on relative perceived risk, by user-provided input scores. Scoring is based on probability, severity (increased mortality/morbidity), impact on healthcare community and the protective values of internal and community response readiness.	Does not incorporate baseline data, does not address at-risk populations.	Los Angeles Department of Public Health. Based on adaptations of Kaiser Permanente's HVA tool.
UCLA Hazard Risk Assessment Instrument	Provide guidance in determining the likelihood of hazards occurring, community vulnerabilities, and community resources. Potential consequences are estimated in this tool.	Four steps: the probability of mishap, the severity of consequences, scoring of the consequences, and risk analysis.	Public health-specific, cannot easily enter data or manipulate the tool, does not automatically generate calculations/graphs/charts, and does not address at-risk populations.	UCLA Center for Public Health and Disasters.
Kaiser Permanente Hazard Vulnerability Analysis Tool	To identify hazards, through a systematic approach, that may affect demand for hospital services or ability to provide those services.	Probability and impact of threats, mitigation, and preparedness determine which level of risk exists for each hazard. Risk scores will be analyzed and used to prioritize planning, mitigation, response, and recovery efforts.	Hospital and healthcare facility-specific. Does not provide guidance manual, instructions on the tool does not comprehensive, does not incorporate baseline data.	Kaiser Permanente
Community Hazard Vulnerability Assessment	Comprehensive analysis of the health, property, and business impacts of various hazards. This tool is meant to prioritize planning efforts, rate four phases of emergency management, and illustrate the operational and regulatory impact of events. Attempts to align emergency management and operational continuity efforts.	Evaluation of three different topics for varying scoring includes risk occurrence, risk response, and non-weighted.	Does not address at-risk populations	Children's Hospital of Colorado. Based on adaptations of Kaiser Permanente's HVA tool.
Preparedness Guide 201: THIRA Guide	To provide resources and templates that will assist in locating needed information and guidance related to the identification of threats and hazards and subsequent risk assessments.	Broken down into areas of research to facilitate understanding of risk assessments. This has no calculations or outcomes.	Emergency Management Specific, toolkit-guidance document rather than a tool, does not generate calculations or graphs	Developed by FEMA

Source: ASPR TRACIE

Summary of Existing Tools

Several reoccurring limitations were identified in the existing risk and hazard assessment tools used by healthcare organizations. First, the existing tools do not project financial losses or length of

disruptions. Next, with the exception of the KP-HVA tool, none of the tools automatically generates or calculates key factors, making it more cumbersome for administrators to enter data and visualize results. The tools also lack comprehensive data collection that shows the entire impact the identified hazards could have on the facility. Finally, the majority of tools do not address at-risk populations or baseline data. The reoccurring limitations identified above were used to create and pilot the proposed addition to the KP-HVA tool, with the intention of enhancing simplicity and responding to an identified gap.

CHAPTER 3

METHODOLOGY

Research Design/Method

The study uses a scoping review of published regulatory guidance, news articles, and best practices for healthcare business continuity to answer the study questions. This exploratory method has been used for new and emerging topics such as healthcare business continuity. Content analysis has been used to compare regulatory guidance and existing published best practices and recommendations. Additionally, the identified trends from the research will be used to construct proposed additions and variations to the existing KP-HVA tool to enhance the applicability of conducting risk assessments for healthcare organizations.

Data Analysis

The extraction of relevant information to healthcare business continuity attracted from the aforementioned search engines and repositories has been analyzed based on the relevance of the information to business continuity in healthcare operations. Best practices, recommendations, and government findings have been examined to determine their potential contribution to healthcare systems understanding, creating, implementing, or maintaining a business continuity plan. This information was compared to the existing tools to identify gaps as shown in Table 2. During the review of existing literature, documented issues, theories and suggestions for improving the practice, implementation, and support to business continuity efforts have been extracted to be considered in the recommendations for the future state of business continuity in healthcare. Identified best practices in the literature review have been integrated into the proposed addition to the KP-HVA tool.

Development of Proposed Tool – Facility Impact Analysis Tool

Following the scoping literature review and the evaluations of existing hazard vulnerability assessments and risk assessment tools, the accumulated findings have been used to address the identified shortfalls of the current HVA process, by proposing an addition to the existing KP-HVA tool. From the

literature have aided in the creation of a pilot tool to minimize the subjectivity of the established HVA. This proposed addition to the KP-HVA tool has been constructed in collaboration with the Director of Business Continuity and Emergency Pareparedness at Kaiser Permanente, along with subject matter experts in the field of healthcare business continuity and preparedness.

The additional section of the KP-HVA may facilitate an enhanced role in the HVA process and better understanding of the data. The pilot tool maintains the existing framework and ranking of potential hazards to an individual facility from the standard KP-HVA tool, while introducing new fields to determine the length of disruption and financial impacts from each of the identified top hazards. Traditionally, an inter-professional group participates in the annual KP-HVA process, usually including the following core areas:

- Leadership
- Facilities/Engineering
- Clinical
- Emergency Management

After completion of the KP-HVA tool, the healthcare leadership team will use their facility's annual budget to separate the annual revenue projections for inpatient services, outpatient services and emergency room, and/or any applicable services at their facility. The annual revenue projections are to be inputed into the identified columns, with the top ten ranked hazards from the standard KP-HVA automatically populated after completion of the standard KP-HVA. The three service types are separated throughout the tool, allowing the unique characteristics of each of the service types to be captured, while still allowing an accurate projection of the impacts to the entire facility. Each of the aforementioned service types have been found to operate and to be impacted differently during disasters; therefore they have been separated.

Next, the finance tab has the following new fields for operational impacts from the identified hazards: hours operational each week, projected number of hours impacting services, percentage of operations able to be maintained, percentage of services to be recovered, and total additional expenses from the disaster. The fields are to be completed by the same group that completes the standard KP-

HVA. The value of each of the fields is to be determined based off historical information, financial information, facility characteristics, and operational capacities.

All the information that is inputted into the "finance" tab is automatically transferred over to the "summary" tab where the scored length of disruption for inpatient, outpatient, and ER is illustrated in hours for each of the top ranked hazards. Additionally, the financial losses for each of the service lines and entire facility are calculated, again by the different hazards. The final feature of the summary tab is the breakdown of hourly revenue for each service type, not based off any specific hazard. This breakdown provides financial loss projections to leadership for any event that causes interruptions to operations by illustrating the average revenue captured each hour the service type/facility is operational.

Lastly, two additional fields have been added to the "data" tab of the KP-HVA tool for capturing the actual length of the disruption and/or fiancnial impacts of events that have occurred in that calendar year. This capturing of actual data from the length of disruptions and financial impacts will help in the construction of more accurate projections of the impacts that hazards will have on healthcare facilities.

Since the tool could be utilized by seventeen different healthcare provider types identified by the CMS that are required to complete an annual HVA, it must be adaptable to the different service lines of each facility. Three different distinct facility service types have been identified, due to their unique characteristics during various disasters. Based on the operational service lines, each facility may complete one or more of the following service modules: Inpatient, Outpatient, and Emergency Room. Leaders of each of the three service types will identify the projected length of disruption from the hazard, as well as input their unique information related to operational and financial impacts to their facility.

Sample Selection

The proposed additions to the KP-HVA tool were piloted using four different healthcare provider types. The sites were purposefully selected using a convenience sample of one healthcare organization located in the Southeastern United States. The participating healthcare system is the largest in their state, with locations in 12 counties. All the facility participants were part of the same healthcare system. The

sample was selected to test the feasibility and usability of the additions to the KP-HVA tool in the following healthcare settings: Acute Care Hospital, Skilled Nursing Facility, Outpatient Surgery Center, and Physician Practice. The pilot tests were conducted in conjunction with the annual HVA during the first quarter of the calendar year of 2018. The pilot testing for the four different provider-types incorporated the new additions to the tool, using the same methods of group facilitation to score each hazard's impact and preparedness measurements on the organization.

Data Collection Procedure

Data to test the tool was inputted into a survey database during the annual HVA assessment meeting. Each facility assigned an appropriate person or group of persons with access to the operational and financial information to fill out this survey. The determination of answers to questions was made by facility leadership, financial department representative(s), facility representatives and emergency preparedness officials, using historical data and best projections of potential impacts to the facility. Each facility was instructed to bring to the meeting their 2018 annual budget separated into three distinct service types within that organization: Inpatient, Outpatient, and Emergency Room. The three different service types were determined based on their unique characteristics and role during disasters (Horowitz, 2017). While some of the participating organizations had all three service types or only one service type, they were all able to successfully complete the piloting with no deviations needed in collecting and determining the score of the HVA or financial information. The identification of the facilities that participated in the survey was omitted to protect the proprietary financial information and identified vulnerabilities for each of the facilities.

The integration of the proposed tool with the KP-HVA tool was done by collecting financial and operational information from the facility. The leadership was asked to identify the top three hazards that were potential risks to their facility and in that community. Potential hazards included active shooter, bomb threat, dam failure, drought, earthquake, fire, flood, gas leak, generator failure, hurricane, IT system outage, pandemic, tornado, and tsunami. Next, the facility leadership scored each hazard on the impacts it would have on humans, property; then the facility scored their preparedness, internal response

and external response capabiltiies, which combined created the risk score. The additional data was collected in an added tab “finance” that captured information to determine potential financial and operational losses during interruptions of service for each of the top ten hazards. The questions were used to determine the projected length of disruption for each of the top hazards and additional costs that the facility could incur from that hazard. The collected financial information was inputed into the tool, with the scoring of length of disruption and additional expenses to determine the financial loss that the hazard would have on the facility.

Immediately following the completion of the annual KP-HVA with proposed new changes, the chief operating officer or ranking facility leader was provided a four-question survey (Table 3), asking about their perspective on the feasibility and applicability of this addition to the KP-HVA. The questions of this survey were as follows: Does new data enhance your knowledge of financial/operational vulnerabilities from disasters?, Does new data make KP-HVA more meaningful to your position?, Do you feel as though this new additional data will help make a stronger case for mitigation efforts?, Did additional data input take less than 15 minutes to complete? The intent of this survey was to determine the immediate reaction and usability of the proposed additions to the leader of the identified facilities. Additionally, an informal discussion with the participating group and facility leader was conducted, focusing on their perceptions, recommendations, and applicability regarding the proposed additions to the KP-HVA tool.

Finally, twenty-three healthcare and community members of a regional consortium were engaged in a written survey during a quarterly meeting to determine their perceptions on conducting their own risk and hazard vulnerability assessments. Additionally, the survey asked about its usefulness in measuring various operational and financial risks. Of the twenty-three participants, all but one of the participants utilized the standard KP-HVA.

The regional consortium is comprised of multidisciplinary healthcare and community members that are responsible for providing health services or emergency response before, during and following a disaster. The survey of these individuals had these five questions: Do you use the data from your risk

assessment or HVA tool to prioritize business continuity planning?, Do you use the data from your risk assessment or HVA tool to determine potential financial losses during a disaster?, Do you determine the potential length of disruption of health services for the facility?, Based on the identified hazards in the HVA, do you feel as though the current summary of indormation on the risk assessment or HVA is meaningful to facility leadership? Each question had three different response choices: Yes, No, or Not Sure. The survey was completed at the beginning of a quarterly meeting. Each of the twenty-three members filled out the survey, with some members representing more than one organization type. The members that were representing more than one organization type were scored under both sections.

Surveys were collected from the participants following the meeting, results being shown in Table 4. The surveys were reviewed for any missed questions or anomalies by the participants, with all questions being answered and no observed anomalies. To limit any potential bias that background or discussions may have on the participants' answers, the participants were given instructions on the general overview and intention of the survey, but no discussions surrounding the questions was conducted.

Pilot Study

The data collected via the survey was then inputted into the pilot KP-HVA tool, in the financial tab where the sum projections of the financial losses and length of disruptions are outlined for incorporation into the overall KP-HVA tool's summary. All of the calculations to determine the hourly loss of revenue were embedded into the tool, along with instructions to outline the equation and the process to arrive at those numbers. The projected length of disruption and financial losses will accompany the top three hazards; the financial loss rate is calculated by the hour for disruption of services used in any of the hazards in the KP-HVA tool. There was a facilitated discussion of the groups completing the new additions to the KP-HVA tool in which they were encouraged to present their initial perceptions of ease of use, as well as future implications of collected information and usability in an open forum. The notes from the facilitated discussions were captured, and some clarifying questions were asked to ensure appropriate understanding of items being discussed.

CHAPTER 4

RESULTS

Pilot Tool Results

During this pilot project, a financial director for each of the four facility types participated in the scoring of the KP-HVA. The different organization types were used to capture the unique characteristics of each different provider type, as well as to ensure the usability of this addition to the KP-HVA tool with the different provider types. The four different healthcare provider types used for the pilot study are listed in Table 3. Each of the participating facilities was not for profit, but each of the facilities provides a mix of different services.

Table 3: Demographic Characteristics of Pilot Study Provider Types

Provider Type	# Beds	Status	Inpatient Services	Outpatient Services	Emergency Room
Acute Care Hospital	45	Not For Profit	Yes	Yes	Yes
Skilled Nursing Facility	120	Not For Profit	Yes	No	No
Physician Practice	12 Exam Rooms	Not For Profit	No	Yes	No
Outpatient Surgery Center	4 Surgery Suites	Not For Profit	No	Yes	No

Rural Acute Care Hospital (ACH)

The acute care hospital studied is a licensed 45-bed facility that is in a rural area, and that is part of a larger healthcare system. The inpatient and emergency room services are operational 24/7 a day, 365 days a year while the outpatient services have extended Monday-Friday operational business hours. This hospital offers the following services:

- General Medicine Beds (Inpatient)
- Long Term Acute Care (LTAC – Inpatient)
- Rehabilitative Services (Outpatient/Inpatient)
- Diagnostics and Imaging (Outpatient/Inpatient)
- Emergency Room (Outpatient)

Suburban Outpatient Surgery Center (OPSC)

The outpatient surgery center that was used in the study and is located in a busy urban area, which has four outpatient operating suites. This center conducts non-acute outpatient surgeries five days a week, with traditional business hours. This center offers the following services:

- General Surgery
- GI Surgical Procedures
- Ophthalmology

Rural Skilled Nursing Facility (SNF)

The skilled nursing facility that was used in the pilot project has a licensed bed capacity of 120 beds and is located in a rural county.. This facility is an inpatient facility that does not offer outpatient rehabilitative services. This facility is budgeted and regularly operates at 95% of their capacity throughout the year. This facility offers the following services:

- Skilled Nursing (Inpatient)
- Rehabilitative Services (Inpatient)

Metropolitan Physician Practice – Family Medicine (PP)

The identified physician practice for this pilot project has twelve active exam rooms that specialize in internal medicine and is located in an urban area. The practice employs 15 full-time physicians, with other advanced practitioners as part of their staffing. The practice is operational Monday-Friday with traditional business hours. This facility offers the following services:

- Primary Care – Family Medicine (Outpatient)

Pilot Study Results

Top Identified Hazards

All four facilities were able to collect the necessary data to complete the pilot modules of the KP-HVA. There was a wide range of hazards selected by the four facilities for this module. The most commonly identified hazards were HVAC Failure (n=2), and tornado (n=2). Other potential hazards were communication/telephone failure, internal flood, inclement weather, IT system outage, generator

failure, water interruption, and epidemic. The hazards were identified by using historical data of the listed hazards that have directly or indirectly affected the operations of that particular facility.

The historical data for each of the facilities was collected from the South Carolina Emergency Management Division (SCEMD) and the county emergency management department where the facility is located. Participants were given instructions to score any hazard that occurs more than once a year as a “high” probability, hazards that occur every 2-3 years as “moderate” probability, hazards that occur 3 or more years as a “low” probability, and any hazard that is not possible as “N/A”.

Two similarities were noted in the results; both were with alike provider types. Both the inpatient facilities, ACH and SNF had listed tornado as one of the top three hazards to their facility, with the ACH ranking the tornado as the highest risk and the SNF ranking it the third highest risk. The rationale and discussion behind ranking tornado in the top three for both inpatient facilities was that a tornado can cause significant damage, facility evacuations, and long-term inability to utilize the facility. Additionally, both of the outpatient facilities ranked HVAC failure as their third highest ranking hazard for their facilities. HVAC was chosen in the top three due to the inability to render any services while the HVAC was not operational. The outpatient surgery center and physician practice would elect to cancel appointments and surgeries until the HVAC system was restored. The outpatient surgery center added that they would not be able to maintain humidity levels, or ensure sterile environments for their patients in the event of this type of failure, while the physician practice cited that the patients’ comfort and satisfaction would be greatly impacted.

Estimated Length of Disruptions

The length of disruptions is estimated in the total hours that the facility is closed or unable to render services during the different hazards. The length of disruptions is calculated in hours, as some disasters are short-lived, while others are calculated in days. The identification of hazards that would completely disrupt services, along with the length of time during which they could disrupt services is especially important in the continuity planning and risk mitigation, as this calculation results in the highest operational and financial impacts.

Both the inpatient facilities scored the disruption length of services from each of their hazards as lower than their outpatient counterparts. The inpatient facilities scored the length of disruptions as low due to the fact that their patient population would remain in their care, unless evacuation was warranted. The SNF did estimate that both the water interruption and tornado would cause 10 hours of disruption to their services, specifically inpatient rehab. The SNF identified that while the rehabilitative services are for inpatient use only, the providers for those services are outsourced from a different company, which would likely result in cancellation of rehabilitation patient services. The cancelled services would not be billable to insurance, unless they were rescheduled, which would be at the discretion of the provider.

Both the outpatient facilities estimated full-day closures (10 hours) for their third highest ranking hazard, HVAC failure. Communication/telephone failure and epidemic were estimated to not cause any disruption to operations, the internal flood was estimated to disrupt 30 hours, and severe weather was estimated to disrupt 20 hours. Both the facilities indicated that in both circumstances they would attempt to reschedule or reassign appointments to an unimpacted same facility type if possible, which they have done in the past successfully.

Increased Additional Expenses

Increased additional expenses were broken down into four different categories for groups to estimate potential costs based on the hazards they were scoring. The four categories were increased labor costs, increased supplies and consumable costs, increased contractual expenses (excluding labor) and increased repair and replacement costs. These four categories were identified due to their applicability to historical damage categorization by FEMA, and discussion of them in the literature review.

The estimated additional expenses for both the inpatient facilities (ACH and SNF) were significantly higher than the two facilities that solely provided outpatient services. The participants for each of the inpatient services referenced the need for them to continually maintain sufficient levels of care to their patients, throughout any disaster. The increased labor (estimated to be $5,000-$15,000 per

incident/per service type) and contract costs ($10,000-$25,000 per incident/per service type) were identified as two “major additional expenses that usually accompany disasters.”

The research showed that the increased repair and replacement costs estimated for HVAC failure were the same for both the PP and OPSC, and HVAC failure was ranked as their third highest hazard. The potential reasoning for the same projections for the replacement/repair costs was the same engineering/facility representative was present for both the facility types.

The feedback from the hospital group idicated that knowing the hourly loss of revenue rate as $16,162.00 per hour for all services would be beneficial during and after a disaster to financial analysts and organization leaders. The group went on to add that currently they are able to track the number of surgeries/procedures rescheduled; however they are unable to determine if those rescheduled appointments were kept.

Estimated Percentage of Normal Operations to be Maintained During a Disaster

The estimation of normal operations to be maintained during a disaster is aimed at capturing the lesser percentage of disruptions to services, instead of the total closure of the facility as documented in the total disruption of services. The estimated reductions in services is a way to quantify the impact that hazards can have on the various types of services.

Again, there were notable differences between inpatient and outpatient facilities, with the inpatient facilities showing a lesser impact of operations from disasters than outpatient facilities. As previously outlined, inpatient services maintain their services unless there is an evacuation of all or part of the patient population. The outpatient services scored the ability to maintain services at 0% for all of their top hazards, with the exception of HVAC failure, which was scored at 25% capacity and 85% for communication/telephony failure for the physician practice. The physician practice concluded that a telephone failure could impact future appointments being scheduled, but would have minimal impact on the current day’s operations. Additionally, the physician practice rated the HVAC failure at 25% due to some patients choosing to be seen, regardless of this failure.

Estimated Percentage of Services That Could be Recovered

Capturing the difference between total revenue loss and temporary revenue loss from an interruption in services, estimated percentage of services being recovered is intended to identify the services that the facility can recover following the interruption of services. The calculation of services recovered is illustrated as a percentage which is subtracted from the service type revenue losses during the interruption.

Both inpatient and outpatient groups commented the majority of their services could be rescheduled; however the financial directors admitted this data is something that is not readily available nor has it been tracked in the past. The participants mentioned that this capability could be present in their EHR, but if so, it could only outline the initial rescheduling of the appointment, not the participant keeping the appointment.

The outpatient services identified that the majority of their services were able to be recovered or rescheduled, as their caseload was predominantly elective cases. Additionally, the outpatient services did again mention that they would attempt to reassign patient appointments to other unaffected similar locations, and/or extend operating hours of their site upon resuming operations. Inpatient services again mentioned that their inpatient populations would remain in the facility, causing them to score all of their recovered services at 100%.

Stakeholder Feedback

Results of the post-survey group discussion include the following themes. First, each facility found the additional information insightful into the impacts of the hazards, citing that historically they had not considered the implications that these hazards could have on their facilities. Each setting identified specific features and benefits that were more useful than others. A common theme was that the additional information gives leadership and managers a basis to make informed decisions during disasters. Specifically, skilled nursing and outpatient representatives felt that projecting additional expenses from disasters is helpful for managers to understand. These two stakeholder types also indicated the additional tracking of financial and operational disruption would be a useful addition when completing the annual KP-HVA. The family practice group has never completed an annual KP-HVA, as

this is a new CMS requirement for the setting. The physician practice respondent also noted that differentiating between appointments that are rescheduled and those that are fulfilled would be beneficial to know and this capability does not currently exist. Although this is their first time completing this type of exercise, the practice leadership views this information favorably, and believes it will be helpful when determining closures or alterations in operational hours.

Discussions from the outpatient surgery group were focused on the decision-making process of closures and alterations of traditional schedules during disasters, with some desire from the group to more firmly outline timelines for making these decisions, as several of their patients have pre-surgery preparation activities at their residence, which would not be needed if cancellations were to take place. The group also discussed the post-disaster rescheduling of patients, factoring in the potential need for increasing hours of operations to ensure that the patients receive their care in a timely manner, for their surgery schedules are set many months in advance. Lastly, the group considered the potential need to increase operating hours to their site, as well as the feasibility of shifting canceled cases to other affiliated surgery centers.

All facility respondents agreed that a reference table of previous disasters and the average length of disruption the disasters caused similar institutions would be useful when projecting the length of disruption. The description and intention of the new fields in the "data" table of the KP-HVA tool were described to the groups, with the groups agreeing that over time the collection of similar events could help to limit the subjectivity of this particular scoring field.

Each financial director voiced concerns about the subjectivity of scoring the estimated length of disruptions for each of their identified top hazards, with some disagreements and questions being voiced by the participants. There were some questions and confusion from each of the respondents. Specifically, they were asking for additional clarification, predominantly around the intensity of the hazard being discussed.

Survey of Leadership

Immediately following the completion of the annual KP-HVA scoring and the proposed financial calculations, each respondent was given a paper survey asked four questions.

All four facility representatives agreed on three of the four items (Table 4):

1. The data enhanced their knowledge of financial and operational vulnerabilities from disasters;
2. The new data made the KP-HVA more meaningful to their leadership position; and
3. The new additional data will help make a stronger case for justifying mitigation efforts and planning

The timing of the additional data was intended to determine if the new additional information to be collected would increase the time it takes to complete the KP-HVA by more than 15 minutes. The survey showed that 75% of the participants said that the additional information took less than 15 minutes to complete, while the rural acute care hospital cited it took longer than 15 minutes to complete.

The conclusion of this survey reveals that healthcare leaders that participated in this study do see a benefit in the additional calculations, even when there is a lengthier time commitment for completion. Leadership participants were geninuely curious about the tools' ability to anticipate financial and operational impacts from hazards, citing that historically they have not known of these impacts when making decisions.

Table 4: Post Study Completion – Participant Survey Results

Post Pilot Survey Questions	Acute Care Hospital	Skilled Nursing Facility	Outpatient Surgery Center	Physician Practice
(Response Choices)	(Yes – No – Not Sure)	(Yes – No – Not Sure)	(Yes – No – Not Sure)	(Yes – No – Not Sure)
Leadership – Does new data enhance your knowledge of financial/operational vulnerabilities from disasters?	**Yes**	**Yes**	**Yes**	**Yes**
Leadership – Does new data make KP-HVA more meaningful to your position?	**Yes**	**Yes**	**Yes**	**Yes**
General – Do you feel as though this new additional data will help make a stronger case for mitigation efforts?	**Yes**	**Yes**	**Yes**	**Yes**
HVA Group – Did additional data input take less than <15 minutes?	**No**	**Yes**	**Yes**	**Yes**

Regional Healthcare Coalition

Results of the regional consortium survey indicate that there are some similarities and differences in responses from the different healthcare facility types, as well as the non-healthcare community participants.

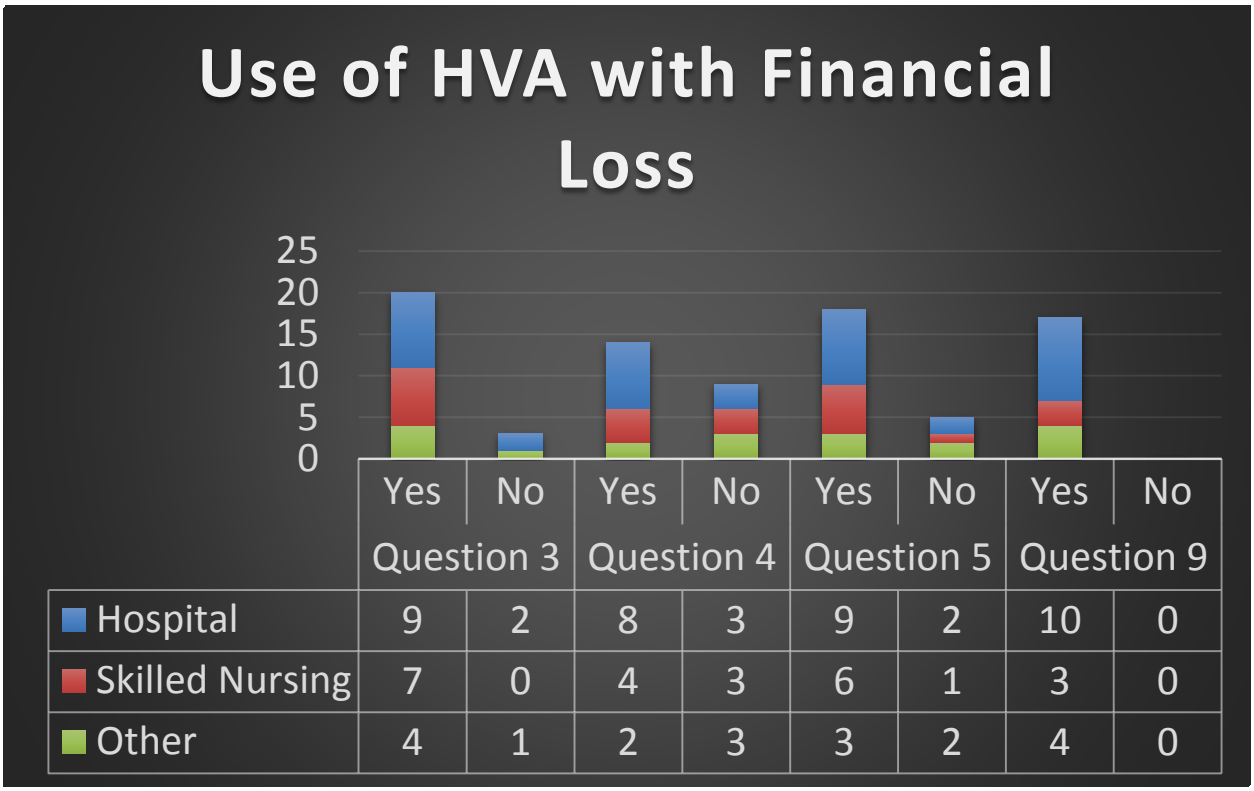
The similarities across respondents shows the current summary of information on the risk assessment or HVA is meaningful to facility leadership. Additionally, across all respondents and facility types, a large majority use the HVA to determine the length of disruption of their services. A notable similarity across the majority of all healthcare providers, as well as non-healthcare entities is that they do not currently use their risk assessments to determine financial impacts from the potential hazards.

Identified differences amongst the different facility types are most notable in the responses for the use of the HVA to prioritize business continuity planning with 100% of skilled nursing facility

respondents answering that they use their HVA to determine business continuity planning while only 22% of hospital respondents and 25% other healthcare facility types use the information for that purpose.

The collected survey was intended to illustrate basic views and uses of different healthcare facility types and non-healthcare entities. The survey shows that healthcare preparedness professionals in this consortium do feel as though the information summarized in the HVAs is useful to their leadership, for capturing financial and operational risks to their organizations is not something being calculated or represented in their hazard assessments.

Table 5: Regional Healthcare C



oalition Survey Results

(Question 3): Do you use the data from your risk assessment or HVA tool to prioritize business continuity planning?
(Question 4): Do you use the data from your risk assessment or HVA tool to determine potential financial losses during a disaster?
(Question 5): Do you determine the potential length of disruption of health services for the facility, based on the identified hazards in the HVA?
(Question 9): Do you feel as though the current summary of information on the risk assessment or HVA is meaningful to facility leadership?

CHAPTER 5

DISCUSSION

Introduction

The intent of this doctoral project was to identify the inadequacies and shortfalls of the existing framework and regulations regarding the process for scoring and prioritizing risks and vulnerabilities to healthcare providers. The identification of the gaps within the annual risk and hazard assessments led to development and incorporation of the new elements designed to overcome the identified shortfalls into the process and create more meaningful and compelling information regarding the risks and hazards, namely to identify: what do these risks and vulnerabilities mean to the organization. Quantifying the potential financial and operational impacts to a healthcare facility will help healthcare leadership make informed decisions about investing in mitigation measures to protect their facility before the storm, as well as supporting their operational decisions during a disaster.

Identifying and including the potential operational and financial impacts from each of the hazards on the Kaiser Permanente – HVA tool provides quantifiable comprehensive look into the impacts that hazards will have on a facility. The inclusion of projected length of disruption and financial losses from each hazard into the KP-HVA tool was identified through the survey as enhancing the purpose and understanding meaning of the annual risk assessment for healthcare leaders.

The various group participants and leadership for each of the different facility types overwhelmingly acknowledged the benefit that this additional information could make in prioritizing business continuity and resiliency planning, as well as in making operational decisions before, during, and after a disaster has impacted their facility. The conclusions of the pilot study and surveys show that there is a lack of utilization of the HVA, due largely to the lack of information compelling healthcare leadership to act on their identified risks and vulnerabilities.

Overview of Findings

The findings of this study suggest that various types of healthcare facilities and leadership understand the importance and intentions of completing risk and hazard assessments, but are unable to make the results of these tools minimize operational and financial risks to their facilities, as they are intended to do. Group discussions and results of the study suggest that there is a lack of meaning in the output of the existing risk and hazard assessment tools. Currently different individuals from all facility types outlined various ways of utilizing the collected data before, during, and after a disaster. The facilitated discussions led to a more thorough understanding of the impacts that disasters can have on their facilities, both short and long-term.

Facility leadership communicated that they feel more comfortable discussing risks to their facilities with quantitative projections of operational and financial impacts from the identified hazards. Additionally, leadership cited that in the past they often understood the hazards to their facilities and even some of the vulnerabilities; however, they felt as though there was a lack of communication to them regarding the next steps to minimize the presented risks. The Chief Opporating Officer of the acute care hospital revealed that cost-benefit analysis and proposals from departmetns were an everyday part of their responsibilities, making them feel more comfortable with numbers and projections in front of them to aide in their decisions. In his summary, he wants to know, what happens if we do not do this (mitigation efforts)?

Research Question # 1 Findings

This study set out to determine the benefits to healthcare facilities of prioritizing their business continuity planning efforts, for the research has shown that 48% of healthcare facilities as of 2017 felt as though they were not able to meet the requirement of creating business continuity plans. Research completed from this study has shown that through the identification of quantifiable operational and financial impacts to a facility, healthcare leadership is more likely to seek out risk reduction and mitigation strategies to lessen the impact that the hazards can have on

their facility. Leadership cited that the ability for them to reference quantifiable financial risks to the facility could be paired with a standard cost-benefit analysis to determine the financial feasibility of implementing risk reduction measures.

Research Question # 2 Findings

The additions to the KP-HVA tool illustrate that it is possible to calculate potential financial losses to a healthcare facility during disasters or interruptions to their normal operations. Additionally, the tool is able to determine the revenue generated each hour for the various facility types, meaning that even if the disruption of services were to last longer than initially anticipated, the facility could determine financial losses for the new length of disruption to their services. The various man-made, naturally occurring, and technological hazards that are included in the KP-HVA all have the potential to interrupt business operations, available services, and revenue streams. The new additions to the KP-HVA tool will allow healthcare facilities the ability to quantify those interruptions and impacts from the aforementioned hazards.

Research Question # 3 Findings

Through the exploration of the pilot study and facilitated discussions following the completion of the study, the ability to utilize the financial and operational information to determine fiscal management policies and procedures was confirmed by financial analysts and facility leaders. This information prompts revisting business interruption insurance levels and quantify financial and operational disruptions to services by the different hazards identified in the KP-HVA tool. Future versions should include additional clarification and instructions, predominantly around the intensity of the hazard being discussed. In addition, sample data estimating the length of disruption for hazards would help financial directors to better project the amount of time a facility could be impacted.

Discussion of Results in Consideration of Future Research

As enterprise-wide healthcare business continuity is still in the infancy stages of development, there are numerous areas within this field of study that could benefit from further research. The topics of disaster risk assessment and hazard vulnerability assessment on

healthcare facilities have been lacking in the field of academic research studies. The lack of research studies in the fields of risk and hazard assessments in healthcare has prompted skepticism and uncertainty regarding the required annual assessment. Lack of buy-in is especially true in healthcare leaders who are one of the intended audiences for the results of the assessment.

The research from the collected pilot study survey responses shows that facility leadership appreciates and is more comfortable with objective financial and operational data, as this is what they are accustomed to when making other leadership decisions. Future research should incorporate this finding as a basis for additional research projects. The identification and customization of additional data in the presentation of risk and hazard assessments to a targeted audience of healthcare executives and decision-makers should be a priority, as these persons in healthcare are the ones who determine financial and organizational priorities. In addition, future studies should examine the accuracy of the projected data such as the estimated hours of disruption that occur in a healthcare facility during a disaster. A discussion item identified in the ACH group discussion was the feasibility of projecting patient satisfaction scores or Hospital Consumer Assessment of Healthare Providers and Systems (HCAHPS) following a disaster. The recommendation for this potential inclusion into facility predictions of the risks stems from the HCAHPS score being tied to CMS reimbursements, meaning potential additional financial impacts (short-term and long-term) that these various hazards can have on an facility.

Implications of the Study

The financial and operational impacts that hazards have on healthcare facilities continue to rise. While healthcare facilities have been required to complete an annual risk and vulnerability assessment for nearly two decades. The information being collected and understanding of the intended audiences have not minimized the impacts that hazards have on healthcare organizations since the regulatory mandate went into effect. The continued increase in

operational interruptions from hazards, despite this mandate, has led to the evaluation and questioning of existing risk identification efforts.

The inability of healthcare facilities to meet the new business continuity planning standard could have severe regulatory financial penalities, in addition to the financial losses of a disaster. CMS outlines that any participating facilities that receive reimbursements from their program must meet the new standard, or they are in immediate jeopardy of having their reimbursements withheld.

The finding of the research has shown that the decision makers within healthcare organizations feel more comfortable when they have comprehensive and quantifiable information when making operational and financial decisions for the organization. With this information healthcare leaders feel as though they are better able to determine the need for pre-disaster mitigation efforts, operational decisions during the disaster, and post-event recovery actions.

The incorporation of more objective and quantifiable information into existing mandated risk and hazard assessment tools will reduce misunderstanding, and increase usefulness of the annual risk assessments, and better addressing the identified needs of healthcare executives in making informed decisions regarding the operational and financial security of their facilities.

Policy Implications

The literature review and results of this study show that healthcare facilities and leaders consider business continuity planning as a top priority for their organizations, despite the prediction that they will not being able to address this requirement (Office of the Assistant Secretary for Preparedness and Response, 2017). The lack of confidence of healthcare facilities to meet this new CMS requirement of implementing and maintaining a business continuity plan suggests the need for additional guidance. The ability of the leaders to prioritize their business continuity planning efforts will help healthcare facilities focus their efforts on the identified top hazards to their facility.

Existing annual regulatory requirements have facilities prioritizing their risks and hazards in order to focus on hazard mitigation and inform planning efforts of healthcare facilities. The aforementioned addition to the widely used KP-HVA tool could help prioritize business continuity planning, in the same way that mitigation and planning efforts are prioritized with the intention of helping healthcare facilities focus on the top vulnerabilities of their facilities.

The intent of the additional information in the KP-HVA tool is to mimic the requirement of the current annual HVA, but with the identification of risks and vulnerabilities to the business and operational aspects of the healthcare facility. An emphasis on annually re-evaluating the priorities of business continuity should be combined with the annual re-evaluation of risks to the healthcare organization. With the changing of business continuity planning to one of the top four priorities for healthcare facilities to focus on in 2017-2022, the ability to guide healthcare facilities in the prioritization of this undertaking should be made available. As risks to a healthcare organization change, so do business continuity priorities. Annual review and prioritization will help enable healthcare facilities to focus on the needed efforts to make their facilities more resilient during disasters.

Recommendations

If the facility is seeking a more detailed analysis of losses per each department, the survey tool should be filled out by each department leader and support team, and then the collected information can be used independently or collectively. The inclusion of all departments in this process would provide greater detail into the interruptions and possible additional expenses from disasters; however, the ability to engage all departments within a facility could be logistically difficult and time consuming for both the departments and the group collecting the information.

As recommended by the surveyed outpatient surgery department, the capturing of actual disruption lengths, financial , and additional expenses from events would be beneficial to this tool. Continued tracking and capturing of events throughout the year in keeping with these

elements added to the KP-HVA tool, would enable facilities to collate needed information to better project impacts of hazards.

This proposed addition to the KP-HVA tool was constructed in collaboration with the Director of Business Continuity and Emergency Preparedness at Kaiser Permanente and subject matter experts in the field of healthcare business continuity and preparedness. The collaboration is intended to potentially release a new optional version of the KP-HVA tool, allowing the user to determine an operational and financial impact projection to accompany their ranking hazards. As this dissertation is meant to add to the preparedness, mitigation, response and recovery efforts of healthcare providers, all works and collaborations will be made publicly available for providers to use at their discretion.

The proposed additions to the KP-HVA tool are intended to engage healthcare leadership, risk managers, and financial analysts within the facility to make the existing information and ranking of hazards more meaningful to intended audiences. By projecting and presenting the operational and financial risks a hazard may have on the facility, a clear overview of hazard impacts upon the facility will help prioritize business continuity planning and mitigation efforts with the intent of lessening the impacts of these hazards. In addition to prioritizing efforts, the new quantitative information will help facility leadership make informed decisions to protect their facility from the threat of a hazard.

Limitations of the Study

The study employed a scoping review of archival published texts and data to answer the study questions. This method of research was chosen due to the limited sources of published articles and data on this subject due to the infancy of this new federal mandate. This methodology allowed for a review of available literature directed to healthcare organizations and the general public on this topic, both in regulatory guidance and published texts. The primary limitation of this study is the dependence on publications of this topic, as well as the nature of government regulatory guidance documents.

With limited guidance and research being available for reference, the review of the literature and scholarly articles was limited due to healthcare business continuity being an emerging topic. Most of the literature in this field is about healthcare information services and technology business continuity and disaster recovery planning, as a specific sub-topic of the broader topic of enterprise-wide healthcare business continuity. The literature and background of the healthcare information services continuity planning were reviewed, with some consideration of similar findings incorporated into this project.

The pilot study portion of this project was limited to one health system with identification of four different healthcare provider types to determine the validity of this effort to the most prominent healthcare provider types. While the four healthcare provider types were piloted successfully, there are a remaining thirteen different provider types that were not included in this pilot project. Additionally, with the pilot study being composed of facilities within one healthcare organization, there could be varying characteristics and variables in other healthcare organizations that might skew or alter the intent and/or output of the information being collected. Differing financial and budgeting reporting and projecting tools as well as differing organizational business priorities could affect the usability of this tool.

Conclusion

The need for healthcare providers to be more operationally and financially resilient from the effects of both man-made and naturally occurring disasters, as well as technological hazards is apparent, as healthcare providers have continued to falter during and following disasters over the past two decades, despite efforts to identify, prioritize, and mitigate their hazards. As healthcare's financial modeling and regulatory landscapes continue to evolve, interruptions in provided services may create financial and regulatory hardships for healthcare providers.

As outlined in the final rule by CMS, operational and business continuity planning and ability is listed as one of the top three priorities identified for healthcare providers to incorporate into their emergency preparedness planning. The recent release of the final rule in November of

2017 has tied business continuity planning to federal reimbursement funds, making the penalty for non-compliance by providers more severe.

As enterprise-wide healthcare business continuity planning and the federal CMS guidance regarding this requirement are still in the infancy stages, the long-term outlook and compliance ratings of this effort are still largely unknown. While the future of business continuity planning in healthcare is still largely unknown, the refining of risk and hazard identification and of prioritization in healthcare is present in nearly every facet of healthcare. Truly minimizing the impacts that risks and hazards may have on an organization requires more than the identification and prioritization of risks. It requires that the scoring of those risks is meaningful and actionable by healthcare leaders. In order to evoke action and needed change to mitigate hazards and risks to the organization, leaders need to understand the information and implications of the information being presented in a format that they understand. Healthcare leaders are compelled by objective and quantifiable data regarding operations and finances,and for that reason the inclusion of this information into the summary of identified risks and hazards makes sense.

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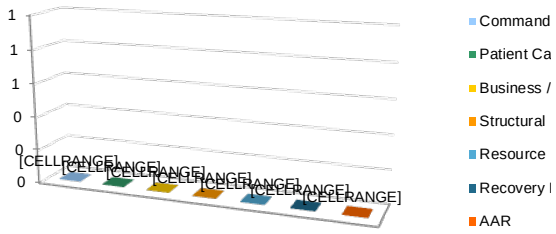
Appendix: Kaiser Permenente Emergency Management Tool

Event	PROBABILITY	ALERTS	ACTIVATIONS	SEVERITY = (MAGNITUDE - MITGATION)						RISK
				HUMAN IMPACT	PROPERTY IMPACT	BUSINESS IMPACT	PREPARED-NESS	INTERNAL RESPONSE	EXTERNAL RESPONSE	
	Likelihood this will occur			Possibility of death or injury	Physical losses and damages	Interuption of services	Preplanning	Time, effectiveness, resources	Community/Mutual Aid staff and supplies	* Relative threat
SCORE	0 = N/A 1 = Low 2 = Moderate 3 = High	Number of Alerts	Number of Activations	0 = N/A 1 = Low 2 = Moderate 3 = High	0 = N/A 1 = Low 2 = Moderate 3 = High	0 = N/A 1 = Low 2 = Moderate 3 = High	0 = N/A 1 = High 2 = Moderate 3 = Low	0 = N/A 1 = High 2 = Moderate 3 = Low	0 = N/A 1 =High 2 = Moderate 3 = Low	0 - 100%
Active Shooter										
Acts of Intent										
Bomb Threat										
Building Move										
Chemical Exposure, External										
Civil Unrest										
Communication / TelephonyFailure										
Dam Failure										
Drought										
Earthquake										
Epidemic										
Evacuation										
Explosion										
External Flood										
Fire										
Flood										
Forensic Admission										
Gas / Emmissions Leak										
Generator Failure										
Hazmat Incident										
Hazmat Incident with Mass Casulaties										
Hostage Situation										
Hurricane										
HVAC Failure										
Inclement Weather										
Infectious Diseae Outbreak										
Internal Fire										
Internal Flood										
IT System Outage										
Landslide										
Large Internal Spill										
Mass Casualty Incident										
Natural Gas Disruption										
Natural Gas Failure										
Other										
Other Utility Failure										
Pandemic										
Patient Surge										
Picketing										
Planned Power Outages										
Power Outage										
Radiation Exposure										
Seasonal Influenza										
Sewer Failure										
Shelter in Place										
Strikes / Labor Action / Work Stoppage										
Suicide										
Supply Chain Shortage / Failure										
Suspicious Odor										
Suspicious Package / Substance										
Temperature Extremes										
Tornado										
Transportation Failure										
Trauma										
Tsunami										
VIP Situation										
Water Contamination										
Water Disruption										
Weapon										
Workplace Violence / Threat										
Zombies										

Kaiser Permanente Summary Page

ALERT TYPE	OCCURRENCE
Command Center Activation	0
Patient Care Impacts	0
Business / Operational Impacts	0
Structural Impacts	0
Resource Request	0
Recovery Plan Activated	0
AAR	0
Total Alert	**0**



2018

TOP 10 HVA	RANK	OCCURRENCE
	1	
	2	
	3	
	4	
	5	
	6	
	7	
	8	
	9	
	10	

2018

TOP 10 ACTUAL ALERTS	OCCURRENCE	HVA RANK
	0	

Proposed Addition to Kaiser Permanente HVA Tool – Financial Impact Summary Tab

0		Projected Length of Disruption to Service Types (Hours)			Projected Financial Loss to Service Types ($)			Est. $ Loss
TOP 10 HVA - FINANCIAL IMPACTS	RANK	LOD - Inpatient	LOD - Outpatient	LOD - ER	Inpatient $ Loss	Outpatient $ Loss	ER $ Loss	
	1	0	0	0	$	$	$	$
	2	0	0	0	$	$	$	$
	3	0	0	0	$	$	$	$
	4	0	0	0	$	$	$	$
	5	0	0	0	$	$	$	$
	6	0	0	0	$	$	$	$
	7	0	0	0	$	$	$	$
	8	0	0	0	$	$	$	$
	9	0	0	0	$	$	$	$
	10	0	0	0	$	$	$	$
Total Hourly Revenue Per Service Type					$	$	$	$

Proposed Addition to Kaiser Permanente HVA Tool – Financial Impact Data Input Tab

		Inpatient Services						Outpatient Services						Emergency Room					
		Operational Hours Each Week	FACILITY FINANCIALS	OPERATIONAL IMPACTS		FINANCIAL IMPACTS		Operational Hours Each Week	FACILITY FINANCIALS	OPERATIONAL IMPACTS		FINANCIAL IMPACTS		Operational Hours Each Week	FACILITY FINANCIALS	OPERATIONAL IMPACTS		FINANCIAL IMPACTS	
		# of Hours Open Each Week (24/7=168 hrs)	Budgeted Annual Gross Revenue	Projected # of Hours Impacting Services	% of Operations Able to be Maintained	% of Svcs to be Recovered	Total $ of Additioal Expenses	# of Hours Open Each Week (24/7=168 hrs)	Budgeted Annual Gross Revenue	Projected # of Hours Impacting Services	% of Operations Able to be Maintained	% of Svcs to be Recovered	Total $ of Additional Expenses	# of Hours Open Each Week (24/7=168 hrs)	Budgeted Annual Gross Revenue	Projected # of Hours Impacting Services	% of Operations Able to be Maintained	% of Svcs to be Recovered	Total $ of Additioal Expenses
Rank	Top Three Identified Hazards																		
1																			
2																			
3																			
4																			
5																			
6																			
7																			
8																			
9																			
10																			

Facility Data Collection 1 of 2

Facility Name	
Person Filling Out Form	XXXXXXXX
Facility Leader	XXXXXXXX
Facility Financial Director	XXXXXXXX

Use facility annual budget to complete the step below

	Inpatient	**Outpatient**	**Emergency Room**
Projected Annual Gross Revenue ($)	$	$	$

Use the top three hazards in your Hazard Vulnerability Assessment (HVA) to complete the step below

Event 1	Event 2	Event 3

List the scheduled hours per week for each of the services listed below

	Inpatient	Outpatient	ER
Hours/Week			

List the estimated total disruption (hours) of services for each of the three listed events listed below

(Hours)	Inpatient	Outpatient	ER
Event 1	0	0	0
Event 2	0	0	0
Event 3	0	0	0

List the estimated percentage of normal operations you can maintain during/ following a disaster below

% Svcs Functional	Inpatient	Outpatient	ER
Event 1	0	0	0
Event 2	0	0	0
Event 3	0	0	0

Facility Data Collection 2 of 2

List the estimated percentage (%) of services lost or canceled during a disaster that would be recovered/rescheduled below

% Svcs Recovered	Inpatient	Outpatient	ER
Event 1	0	0	0
Event 2	0	0	0
Event 3	0	0	0

List any projected additional expenses to be incurred by the facility during each of the events listed below

Additional Expenses ($)	Increased Labor Costs($)	Increased Supplies/Consumable Costs ($)	Increased Contractual Expenses ($)	Increased Repair/Replacement Costs ($)
Event 1	$0	$0	$0	$0
Event 2	$0	$0	$0	$0
Event 3	$0	$0	$0	$0