

A Disaster Veterinary Contingency Plan Utilizing the One Health Model and The World  
Organization for Animal Health Guidelines

By

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## **Abstract**

Natural disasters have become increasingly prevalent; disasters in 2022 exceeded \$165.0 billion making it the third most costly year on record, behind 2017 and 2005. These calamities inflict various traumas upon companion animals, including injury, emotional distress, abandonment, and loss. While several established frameworks exist internationally to provide education, training, and contingency plan guidance for disaster management in veterinary services, the United States lacks many of these resources. This project aims to address this gap by developing a contingency plan for the Veterinary Emergency Group (VEG), a chain of emergency veterinary hospitals in the United States that has created a veterinary emergency travel team. The plan will be based on The One Health model and The World Organization for Animal Health guidelines, serving as a comprehensive framework for disaster management. Additionally, the plan will incorporate a detailed communication structure utilizing the Internal Communication System. By leveraging existing frameworks and establishing an effective communication system, this project seeks to enhance the preparedness and response capabilities of the veterinary community during disasters, ultimately improving outcomes for both humans and animals.

## TABLE OF CONTENTS

Abstract.....	1
CHAPTER 1: Introduction.....	11
Background.....	11
Research Question.....	12
Assumptions and Limitation.....	12
<i>Assumptions</i> .....	12
<i>Limitations</i> .....	13
Project Implications.....	13
CHAPTER 2: Literature Review.....	14
Purpose.....	14
Veterinary Services and Disaster Management.....	14
Education.....	15
<i>The World Organization for Animal Health</i> .....	17
<i>World Animal Protection</i> .....	18
Legislation .....	19
<i>Bulgaria</i> .....	20
<i>Australia</i> .....	20

<i>New Zealand</i> .....	21
<i>United States</i> .....	22
<i>Chile</i> .....	23
<i>Italy</i> .....	24
Emotional Effects.....	25
Disaster Management Contingency Methodology Development.....	26
One Health.....	26
History Of One Health.....	26
<i>Manhattan Principles</i> .....	27
One Health Animal Disaster Management.....	28
<i>Planning</i> .....	28
<i>Prevention</i> .....	29
<i>Mitigation</i> .....	29
<i>Preparedness</i> .....	30
<i>Response</i> .....	31
<i>Recovery and Reconstitution</i> .....	31
The World Organization for Animal Health.....	32
<i>The World Organization for Animal Health Disaster Management Guideline</i> ...	32

<i>Mitigation And Prevention</i> .....	33
<i>Preparedness</i> .....	36
<i>Response</i> .....	37
<i>Recovery</i> .....	37
Disaster Management, Animal Welfare, and The Incident Command System.....	38
Incident Command System.....	39
Command Staff .....	40
<i>The Public Information Officer</i> .....	40
<i>The Safety Officer</i> .....	41
<i>The Liaison Officer</i> .....	41
General Staff .....	42
<i>Operations</i> .....	42
<i>Planning</i> .....	42
<i>Logistics</i> .....	42
<i>Finance and Administration</i> .....	43
Disaster Management Guidelines Utilizing the Incident Command System.....	43
<i>Mitigation</i> .....	44
<i>Preparedness</i> .....	45

<i>Response and Emergency Relief</i> .....	45
<i>Recovery</i> .....	46
Veterinary Emergency Group Travel Team.....	47
CHAPTER 3: Methods.....	49
Scope and Objectives.....	49
Conducting a Risk Assessment.....	50
Reviewing Existing Guidelines.....	50
Engaging Stakeholders.....	51
Developing a Disaster Management Framework.....	52
Implementing Contingency Plans.....	52
<i>Mitigation and Prevention</i> .....	52
<i>Preparedness</i> .....	53
<i>Response</i> .....	54
<i>Recovery</i> .....	55
CHAPTER 4: Results .....	56
Define Scope and Objectives.....	57
<i>Assess the Specific Disaster Situation</i> .....	58

Type of Disaster.....	58
Geographic Location.....	59
Historical Data and Patterns.....	59
Stakeholder Engagement.....	59
Previous Case Studies.....	60
<i>Define the Scope of the Contingency Plan.....</i>	<i>60</i>
Geographical Area.....	60
Type of Disaster.....	61
Resources Available for Response and Recovery Efforts.....	61
<i>Determine Objectives to Enhance Disaster Response Capabilities.....</i>	<i>62</i>
<i>Document the Scope and Objectives.....</i>	<i>62</i>
<i>Regularly Review and Update the Scope and Objectives.....</i>	<i>62</i>
Conduct Risk Assessment.....	63
<i>Identify Potential Hazards.....</i>	<i>63</i>
<i>Identify Vulnerabilities.....</i>	<i>64</i>
<i>Analyze Risks.....</i>	<i>64</i>
<i>Document and Communicate Findings.....</i>	<i>64</i>
Review Existing Guidelines.....	65
<i>Identify Relevant Authorities.....</i>	<i>65</i>

<i>Review Applicable Laws and Regulations</i> .....	66
<i>Explore Policies, Guidelines, and Protocols</i> .....	66
<i>Identify Roles and Responsibilities</i> .....	66
<i>Stay Updated on Changes</i> .....	67
Engage Stakeholders.....	67
<i>Communication and Information Sharing</i> .....	68
<i>Joint Planning and Decision Making</i> .....	68
<i>Resource Mobilization</i> .....	69
<i>Mutual Aid and Support</i> .....	69
<i>Public Awareness and Education</i> .....	69
<i>After-Action Review</i> .....	70
Develop Disaster Management Framework.....	70
<i>Get to know the Incident Command System (ICS)</i> .....	70
<i>Adapt the ICS for Veterinary Disaster Management</i> .....	71
<i>Establish the Incident Command</i> .....	71
<i>Develop Standard Operating Procedures (SOPs)</i> .....	71
<i>Establish Communication Channels</i> .....	73
<i>Conduct Training and Exercises</i> .....	73

<i>Continuously Evaluate and Improve</i> .....	73
Implement Contingency Plans.....	74
<i>Plan Activation</i> .....	75
<i>Communication and Coordination</i> .....	75
<i>Resource Mobilization</i> .....	75
<i>Triage and Treatment</i> .....	75
<i>Incident Command System (ICS)</i> .....	76
<i>Continual Assessment and Adaptation</i> .....	76
<i>Support and Care for Veterinary Personnel</i> .....	76
<i>Documentation and Reporting</i> .....	76
<i>Post-Disaster Recovery</i> .....	77
<i>Continuous Improvement</i> .....	77
Mitigation, Preparedness, Response, and Recovery Phases.....	77
<i>Mitigation Phase</i> .....	77
Risk Identification.....	78
Education and Awareness.....	78
Environmental Management.....	79
Early Warning Systems.....	79

Collaborative Partnerships.....	79
Training and Capacity Building.....	80
Documentation and Reporting.....	80
Continuous Monitoring and Evaluation.....	80
<i>Preparedness Phase</i> .....	<i>81</i>
Emergency Planning.....	81
Resource management.....	81
Training.....	82
Information Management.....	82
<i>Response Phase</i> .....	<i>83</i>
Activation and Mobilization.....	83
Assessment and Triage.....	84
Animal Evacuation and Sheltering.....	84
Communication.....	85
<i>Recovery Phase</i> .....	<i>85</i>
Damage Assessment.....	85
Emotional Support.....	86

Continuous Improvement.....	87
Post Evaluation for Future Adaptation.....	87
<i>Post-Response Evaluation</i> .....	88
<i>Training</i> .....	88
<i>Ongoing Monitoring</i> .....	89
CHAPTER 5: Conclusions.....	90
Discussion.....	90
Limitations to the current study.....	92
Directions of future research.....	93
Appendix.....	95
<i>Appendix A</i> .....	95
<i>Appendix B</i> .....	98
<i>Appendix C</i> .....	99
<i>Appendix D</i> .....	100
<i>Appendix E</i> .....	101
Work Cited.....	115

## CHAPTER 1: Introduction

### Background

Disasters have become increasingly prevalent worldwide and the devastating effects of these disasters extend beyond humans, impacting animals as well. As society's perception of animals has evolved, considering them as integral members of families, the focus on animal welfare has shifted accordingly. The United States, where 63% of households own pets, has seen a thriving \$43.2 billion pet industry (Tinsman, 2010). During times of disaster, companion animals face various challenges, including trauma, abandonment, and loss (Dalla Villa et al., 2019). Communities also struggle with the influx of displaced animals, local shelters becoming overwhelmed, and creating safety/biological concerns (Dalla Villa et al., 2019). As designated caretakers for animals, veterinarians and veterinary nurses bear the responsibility of providing medical care during such crises.

While numerous frameworks and guidelines exist for disaster management and contingency planning in veterinary services, access to comprehensive education and training in the United States remains limited (Dalla Villa et al., 2019). Existing courses are predominantly available in select European countries, leaving many American veterinarians uncertain about how to contribute to disaster management efforts or whom to contact. Effective disaster management contingency plans for veterinary services should incorporate avenues for proper communication and clearly define roles and responsibilities.

**Research Question**

Can a veterinary emergency contingency plan be developed for disaster management utilizing The One Health model, The World Organization for Animal Health framework guidelines, and Internal Communication System for the Veterinary Emergency Group?

**Assumptions and Limitation**

This thesis project is based on several assumptions and has certain limitations.

***Assumptions:***

1. The Veterinary Emergency Group (VEG) travel team is already an established entity within the Veterinary Emergency Group organization. Allowing for an easier development phase than for an organization without travel aspects established.
2. The One Health model and The World Organization for Animal Health framework guidelines are suitable and applicable for developing the disaster guideline contingency plan.
3. The Internal Communication System is an effective communication structure that can be integrated into the disaster guideline contingency plan.
4. The project assumes a certain level of willingness and cooperation from the involved stakeholders, including veterinary professionals, emergency management agencies, and other relevant parties, to effectively implement the proposed plan.

***Limitations:***

1. The project focuses on the Veterinary Emergency Group travel team and may not address the specific needs and challenges of other veterinary organizations or individual practitioners.
2. The project's scope is limited to the United States, and the findings and recommendations may not be directly applicable to other countries or regions.
3. The availability and accessibility of resources, such as funding, equipment, and personnel, may vary among different locations and organizations, which could impact the implementation of the disaster guideline contingency plan.

**Project Implications**

This thesis project aims to develop a disaster guideline contingency plan for the VEG travel team, considering the urgent need for comprehensive disaster management contingency plans in veterinary services and acknowledging the assumptions, limitations, and research question. The objective is to establish a structured plan that promotes effective communication and coordination among the travel team, veterinary clinics, and relevant stakeholders. The goal is to enhance disaster response capabilities and potentially save more lives, both human and animal, during disaster situations.

## **CHAPTER 2: Literature Review**

### **Purpose**

This thesis will develop a disaster guideline contingency plan for the Veterinary Emergency Group travel team. The contingency plan will use The One Health model and The World Organization for Animal Health as framework guidelines and utilize the Internal Communication System for the communication structure. Veterinary Emergency Group (VEG) is an emergency veterinary company in the United States. They have the first American veterinary travel team composed of veterinarians and veterinary technicians that provides emergency medical services and emergency response education to VEG locations across 15 different states. The disaster guideline contingency plan will be structured around the use of the VEG travel team and how that team can be incorporated within the Internal Communication System as well as existing emergency networks.

### **Veterinary Services and Disaster Management**

Natural disasters are increasing all over the world with more than 135 disasters declared in the United States alone (Huston & Ebers, 2020). Disasters can tear apart the social fabric of local communities and those effects are seen on both humans and animals (Squance et al., 2018). While the public health focus on animal welfare used to just be on epidemiology or livestock care the perspective on how animals are seen within the household have changed over the years with many animals being considered on the same level as family (Dalla Villa et al., 2019). 63% of the United States owns household pets, creating a \$43.2 billion pet industry (Tinsman, 2010).

During times of disaster, companion animals are subjected to a variety of distress, such as injury, emotional distress, abandonment, or loss (Dalla Villa et al., 2019). Communities face additional impacts because of displaced companion animals (Dalla Villa et al., 2019). Shelters become overwhelmed by pets surrendered to their care (Dalla Villa et al., 2019). Communities affected by disaster can become overwhelmed by lost roaming animals which can cause safety and biological concerns (Dalla Villa et al., 2019).

Veterinarians and veterinary technicians are the only designated members of the community responsible for providing medical care to animals (Madigan & Dacre, 2009).

There are a lot of frameworks already established to provide education, training, and contingency plan guidance (*One health basics*, 2022, OIE, 2016, and Madigan & Dacre, 2009). The United States lacks access to many of these educational platforms because courses are only provided in select European countries (Dalla Villa et al., 2020). Many veterinarians would like to participate in disaster management efforts but are unsure of what to do or who to contact (Huston & Ebers, 2020, Pimentel et al., 2021). Disaster management contingency plans for veterinary services should include avenues for proper communication as well as designated roles and responsibilities.

## **Education**

Disaster management training is not typically included in the veterinary curriculum (Huston & Ebers, 2020). Most of the disaster management education available to veterinarians is not offered until after graduation (Huston & Ebers, 2020). The education offered mainly centers around biological animal disasters and lacks information on disasters like droughts, floods, earthquakes, tornadoes, volcanoes, or other extreme

weather events (Vroegindewey & Kertis, 2020). There is a large disconnect between available disaster management contingency plans and veterinary knowledge/education. One survey assessing 706 practitioners in Mississippi found that only 43% of veterinarians had an emergency/disaster plan established at their clinic (Huston & Ebers, 2020). A study of Bulgarian veterinarians found that only 62% of participants had a clinic disaster plan (Balieva & Ivanov, 2021). Veterinary practitioners who had previously experienced a disaster within the community were the most likely to have a plan in place for their clinic (Huston & Ebers, 2020).

This lack of training and education opportunities extends to a lack of communication between veterinary clinics as well as government disaster management resources (Huston & Ebers, 2020). One study found that veterinary practices do not tend to reach out to government services or emergency services during disasters (Huston & Ebers, 2020). One focus group in New York found that veterinarians who participated were unfamiliar with disaster terminology and were unaware of who to contact for further information about animal welfare services during emergencies (Huston & Ebers, 2020). Another survey in Mississippi found that only 10% of veterinarians would contact the emergency management agent during an animal related disaster (Huston & Ebers, 2020). In the same study, only 17% had emergency assistance agreements established with other veterinary practices (Huston & Ebers, 2020).

Although many veterinary providers have little to no education in disaster management and response techniques many have shown a desire to learn (Huston & Ebers, 2020). One example of this is from a study where only 20% of those surveyed had experienced

formal disaster training, over two-thirds of participants were interested in receiving disaster training (Huston & Ebers, 2020). Online education was the most popular form of desired training delivery (Huston & Ebers, 2020). Another survey assessing veterinary disaster management in rural veterinary clinics found that while 80% of participants had not received any training more than two thirds indicated a desire to receive training (Huston & Ebers, 2020). This desire to learn extends to many non-animal first responders (Pimentel et al., 2021). In one study 63% of first responders surveyed said that they had wanted to help animals during a disaster deployment but did not have the education or tools to know what to do (Pimentel et al., 2021).

### ***The World Organization for Animal Health***

The World Organization for Animal Health (OIE) has developed workshop programs in a variety of Eastern European countries to help them develop their own contingency plans within the veterinary industry (Dalla Villa et al., 2020). These workshops begin with discussion-based style teaching that are designed to brainstorm how contingency plans should be designed based on their individual needs (Dalla Villa et al., 2020). Students develop a contingency plan that they believe works best for their situation (Dalla Villa et al., 2020). A final workshop is set up that simulates their disaster and contingency plan (Dalla Villa et al., 2020). Students then review each other's plans and procedures discussing what worked and what did not so they can better develop contingency plans in the future (Dalla Villa et al., 2020). The services are currently only offered in Eastern Europe (Dalla Villa et al., 2020).

### ***World Animal Protection***

The World Animal Protection initiated a Veterinary Emergency Response Unit (VERU) training program in 2008 (Dalla Villa et al., 2020). The program is for veterinary students to learn how to take a leadership role within the community during a disaster that ensures animal health and welfare (Dalla Villa et al., 2020). Classes have been offered in eight different countries including Columbia, Costa Rica, India, Mexico, Myanmar, Nicaragua, Candia, and Thailand (Dalla Villa et al., 2020).

Costa Rica performs national drills that include companion animals as well as livestock (Dalla Villa et al., 2020). These drills are a great way to establish real-world coordination between veterinary services, the farm and livestock industry, and national emergency services (Dalla Villa et al., 2020). The World Animal Protection developed the manual the Costa Rican for their drills and teaches that information to other countries (Dalla Villa et al., 2020). World Animal Protection also created an online training tool called PrepVet, a learning tool designed to help improve communication between veterinary professionals and civil defense workers during times of disaster (Dalla Villa et al., 2020). This program is available in Spanish, English and Portuguese (Dalla Villa et al., 2020).

The World Organization for Animal Health recommends contingency plans be based around a solid communication strategy within the veterinary community (OIE, 2016). Currently there are some good education platforms in place like the World Animal Protection or the workshops provided by the OIE (Dalla Villa et al., 2020). However, there are plenty of surveys that suggest there is a serious lack of knowledge and

communication within the veterinary industry, first responders, and within public health (Huston & Ebers, 2020 and Pimentel et al., 2021).

### **Legislation**

There are a variety of national and regional disaster preparedness and response networks that frequently call on veterinary services to assist with efforts during times of disaster (Dalla Villa et al., 2020). However, veterinary services historically have not been included in positions of legal authority (Dalla Villa et al., 2020). Disasters can present additional challenges when veterinary services do not have a legally established authority to assist (Vroegindewey & Kertis, 2020). One way to improve public health organizations disaster response would be to develop legislation that includes veterinary services and animal welfare into the contingency plan (Pereira et al., 2021). The World Organization for Animal Health heavily recommends that all contingency plans consider the established legality for all veterinary services involved (OIE, 2016). Disaster management plans should also include what new legislation would be required to make contingency plans involving veterinary care legal and functional (OIE, 2016).

Many countries have developed legislation that establishes a framework for public health to include veterinary services in disaster management preparation. Some legislation, like in Bulgaria and Australia, can lack enough detail that it can unintentionally prevent veterinary services from engaging during disasters (Balieva & Ivanov, 2021). Some countries, like the United States or New Zealand, created legislation because of previous public health disasters that later went on to inspire international legislation (Dalla Villa et al., 2020 and Huston & Ebers, 2020). Finally, the following provides some examples of

the most current legislation that have taken previously developed framework to create some of the most progressive legislation regarding animal protection and disaster management education (Dalla Villa et al., 2020).

### ***Bulgaria***

The Bulgarian legal framework in 2018, developed a national strategy for reducing risk of disasters (Balieva & Ivanov, 2021). The purpose of the national strategy was to include veterinary services into disaster response networks (Balieva & Ivanov, 2021).

Unfortunately, they did not develop a full legal text that allowed veterinarians to be included in the emergency response (Balieva & Ivanov, 2021). This meant that in many cases where veterinary services had been intended, veterinarians were legally prohibited from participating (Balieva & Ivanov, 2021). Many veterinarians wanted to take part in disaster efforts but would have been in a legally questionable position to do so (Balieva & Ivanov, 2021).

### ***Australia***

Prior to 2009, the Australian legislation that was in place for wildfire and safety was known as “Prepare, Stay and Defend or Leave Early” (Travers et al., 2021). This policy emphasized self-responsibility and reliance during disasters and placed most of the responsibility on citizens (Travers et al., 2021). The policy was removed after the Black Saturday bushfires for a more shared responsibility policy under a One Health model (Travers et al., 2021). This new shared responsibility model now includes government support, environmental support, as well as reorienting health services towards promoting overall health (Travers et al., 2021).

Despite legislative changes the current disaster management's model still lacks definitive legislation regarding animal welfare (Travers et al., 2021). This has created confusion about where responsibility lies for emergency responders in Australia (Travers et al., 2021). One survey found that emergency responders still felt the responsibility of animal welfare should be the responsibility of different departments (Travers et al., 2021).

Legislation that would allow for already existing infrastructure to participate in emergency disaster framework could mitigate complication with current non-animal emergency groups (Anthony & De Paula Vieira, 2022). The feelings of the Australian emergency responders are a great example of how rhetoric and legislation can affect the disaster management response. By developing legislation that includes already existing animal service structures, nonanimal emergency groups would not have to be burdened with the additional responsibilities of animal welfare (Anthony & De Paula Vieira, 2022).

### ***New Zealand***

In 2006, the New Zealand government established the National Animal Welfare Emergency Management Adversary Group (NAWEM) as a response to the 2004 Lower North Island flood (Dalla Villa et al., 2020). This legislation was led by the Ministry of Agriculture and Forestry as well as the Ministry of Civil Defense and Emergency Management (Dalla Villa et al., 2020). These organizations connected with the New Zealand Veterinary Association, the New Zealand Society for the Prevention of Cruelty to Animals, Massey University's Veterinary School, and Federated Farmers (a rule advocacy organization) as stakeholders for their public health planning (Dalla Villa et al.,

2020). This legislation was so successful because it included a wide variety of members from the veterinary community (Dalla Villa et al., 2020).

By 2015 the national civil defense emergency management plan had been updated to include animals for the first time (Dalla Villa et al., 2020). By 2019 the NAWEM has been replaced with its own animal welfare subfunction (Dalla Villa et al., 2020). All these developments have allowed the New Zealand government to provide animal emergency assistance such as food, water, and shelter (Dalla Villa et al., 2020). The government also provides preparation and response guidance for animal owners to improve their knowledge of disaster management contingency plans (Dalla Villa et al., 2020). Their overall goal is to improve planning for adverse events from animal and livestock owners all the way to emergency government response (Dalla Villa et al., 2020).

### ***The United States***

During Hurricane Katrina, an estimated 10 to 22% of hurricane victims did not evacuate because emergency evacuation services would not accept animals (Huston & Ebers, 2020). Around \$43 million in funds were raised to assist Hurricane Katrina pet care specifically because of pet owners' refusal to evacuate (Huston & Ebers, 2020). This animal welfare disaster became international news and resulted in the most powerful animal welfare legislation in the United States for disaster management (Huston & Ebers, 2020). It is not uncommon for pet owners to behave in a way that compromises their own safety during a disaster to take care of their animals (Pereira et al., 2021). One survey in North Carolina assessing pet owners from coastal households found that they were

significantly less likely to evacuate if it meant leaving their pets behind (Huston & Ebers, 2020). During one North Carolina hazardous chemical spill 41% of people who had evacuated without their pets later attempted to rescue them causing additional strain on first responders and putting themselves in harm's way (Huston & Ebers, 2020). Studies have shown that overall is more expensive to rescue and shelter animals than it is for owners to individually provide for their animals (Huston & Ebers, 2020).

In 2016, the United States government passed the Pet Evacuation and Transportation Standards (PETS) Act (Dalla Villa et al., 2020). This legislation protects companion animals and service animals during and following major disasters (Dalla Villa et al., 2020). State and local level emergency services are now required to ensure transportation and shelter to individuals and their pets during times of disaster (Dalla Villa et al., 2020). The government will also reimburse states for any shelter and care provided to animals during and following the disaster (Dalla Villa et al., 2020). As a result of this legislation, animal response teams on the state and local level have been developed (Dalla Villa et al., 2020). One of the reasons these teams were created was so pet owners would never have to make the choice again between evacuation and their animals (Dalla Villa et al., 2020).

### ***Chile***

In 2013, the Chilean government enacted the animal protection law 20.380 (Dalla Villa et al., 2020). This legislation plays animal production and transportation providers as well as agricultural and livestock service to develop contingency plans for disaster management (Dalla Villa et al., 2020).

## *Italy*

In January 2018, the Italian government enacted a legislative decree that ensures animals are fully included under the Italian civil protection services (Dalla Villa et al., 2020). This legislative decree allows veterinary services to assist animals during times of disaster (Dalla Villa et al., 2020). Local and regional veterinary services operate under the National Civil Protection System to assist with animal health/welfare, food safety, and veterinary public health (Dalla Villa et al., 2020).

All emergency contingency plans must include legislative backing and emergency animal welfare planning is no different (OIE, 2016). Without properly developed legislation unintended consequences like in Bulgaria and Australia can occur (Balieva & Ivanov, 2021). Learning from consequences, like with Hurricane Katrina, creates the opportunity to improve current legislation to include animal welfare (Dalla Villa et al., 2020). It is also important, like with New Zealand, to include as many stakeholders in the legislation process as possible to create the most effective and progressive changes (Dalla Villa et al., 2020). As a result of changes like New Zealand and the United States other countries such as Chile and Italy have developed their own progressive laws regarding disaster management and animal welfare (Dalla Villa et al., 2020). Legislation matters not only for the countries creating it, but it can also inspire others to improve upon their own legislation.

## **Emotional Effects**

The emotional effects of participating during a disaster affects the veterinary community as well (Vroegindewey & Kertis, 2020). One study from the Netherlands found that after six months of participating in a disastrous event veterinarians were still experiencing mood swings and some suicidal thoughts (Vroegindewey & Kertis, 2020). In the same study up to 40% of the participating veterinarians displayed signs of traumatic stress six years after participation (Vroegindewey & Kertis, 2020). Traumatic stress from veterinary related disasters during emergencies can sometimes involve very gruesome acts such as culling entire herds during biological disasters (Vroegindewey & Kertis, 2020). In 1995, a program to control the Johne's disease outbreak in Australia had to be halted due to the severe psychological distress farmers, non-farming families, and government employees faced from the mass euthanasia (Vroegindewey & Kertis, 2020). Currently, there is not a lot in place to safeguard veterinarians who are participating in disaster assistance from the adverse physical and emotional toll it can take (Vroegindewey & Kertis, 2020). Some researchers have recommended that national veterinary services involved in disaster management incorporate current health and wellness options available from their regions into the local veterinary framework (Vroegindewey & Kertis, 2020).

## **Disaster Management Contingency Methodology Development**

### **One Health**

The One Health model uses local, regional, national, and global levels to address public health outbreaks and disasters (*One health basics*, 2022). The One Health model incorporates all aspects of environmental hazards by including environmental, animal, and human health into the public-health model (*One health basics*, 2022). Incorporating animal health into the public-health conversation protects overall human health (*One health basics*, 2022). For example, many diseases found in livestock or companion animals can spread to humans, keeping animals free of diseases in turn keeps humans healthy (*One health basics*, 2022). One reason the health of companion animals can impact disaster management is because many families recognize companion animals as an addition to their family (Huston & Ebers, 2020). It is important when planning for disaster management programs to understand how the bond between humans and their animals can negatively impact decision-making during times of crisis (Squance et al., 2018). One Health has developed into a fully functioning framework for including the impact of animal welfare in disaster preparation.

### **History of One Health**

One Health is an approach to public health that recognizes how our health is tied to animals and our shared environment (*One health basics*, 2022). The origins of One Health began in 1821 when a German pathologist, Dr. Virchow, realized that the roundworms found in swine could be passed on to humans (*One health basics*, 2022). He defined this concept for pathogen transfer between animals and humans as zoonotic

diseases (*One health basics*, 2022). The understanding of human health and zoonotic diseases continued to develop its importance in the public health community.

In 1947, Dr. James H Steele founded the veterinary public health division at the CDC focusing on the role of animals in epidemiology of zoonotic diseases (*One health basics*, 2022). The development of the public-health division allowed the veterinary community to contribute to zoonotic/biological disasters on an international scale (*One health basics*, 2022). Some of their accomplishments include their public health responses to rabies, brucellosis, salmonellosis, Q fever, bovine tuberculosis, and leptospirosis (*One health basics*, 2022).

Dr. Calvin Schwab developed the Department of Epidemiology and Preventative Medicine at the Veterinary School at the University of California Davis in 1966 (*One health basics*, 2022). Dr. Schwab's felt that human medicine and veterinary medicine contribute to one another to develop the well-being and health of society called, One Medicine (Zinsstag et al., 2011). Over time One Medicine developed into One Health to include the effects of ecological systems on human and animal health (Zinsstag et al., 2011). The One Health concept became more popular as an interdisciplinary approach to biological disasters/diseases and veterinary medicine (*One health basics*, 2022).

### ***Manhattan Principles***

In 2004, The Wildlife Conservation Society organized an international health symposium to outline the priorities for an international response to epidemic and epizootic disasters (Cook et al., 2004). The Manhattan Principles that were presented at the symposium, was a way to define and outline the One Health approach and its 12 leading standards (Cook

et al., 2004). The 12 standards (See Appendix A) urged the health community at all levels to include One Health in their disaster preparation and planning (Cook et al., 2004). Since the Manhattan Principles the One Health approach has been used for pandemic prevention and disease control on an international scale (Cook et al., 2004). These principles can be included when developing a One Health disaster preparation plan.

### **One Health Animal Disaster Management**

One Health creates cooperative groups between human health professionals, animal health professionals, environmental specialists, and other areas of expertise who understand the relationship between the health of animals and its effect on overall public health (*One health basics*, 2022). One Health has moved beyond just biological disasters and is used as a framework for animal welfare during wildfires, floods, droughts, and more (Anthony & De Paula Vieira, 2022). It is important to create a preparation framework that promotes a healthy and sustainable human animal ecosystem (Anthony & De Paula Vieira, 2022). The One Health model breaks the framework down into six categories of disaster management: planning, prevention, mitigation, preparedness, response, recovery, and reconstitution (Anthony & De Paula Vieira, 2022).

#### ***Planning***

During the planning phase of the One Health model professionals should focus on more than just how these disasters affect humans and our environment (Anthony & De Paula Vieira, 2022). A thorough planning phase should include how any species in the targeted area, either companion animal or wildlife, might be affected by the disaster (Anthony & De Paula Vieira, 2022). Organizations should seek to plan for things like medical

necessities, pain management, end-of-life protocols, and disease outbreak management (Anthony & De Paula Vieira, 2022).

### ***Prevention***

The prevention stages should involve how to educate non-animal related personnel (Anthony & De Paula Vieira, 2022). A recent survey of the United States Public Health Service Commission Core found that awareness for planning strategies of the One Health model were weakest in the United States public health workforce (Pimentel et al., 2021). One third of the non-veterinary officers who were surveyed reported encountering animals during a disaster-based deployment (Pimentel et al., 2021). 72% wanted a clear understanding of what to do with animals during emergencies (Pimentel et al., 2021). Planning a prevention strategy that connects public health officials with already existing animal welfare infrastructure is crucial to educating non-animal related personnel on One Health disaster management techniques (Anthony & De Paula Vieira, 2022).

### ***Mitigation***

The mitigation phase for the One Health model uses legislation and regulation to create a framework that seeks to “reduce the physical, behavioral and psychological costs to animals” (Anthony & De Paula Vieira, 2022). Many existing emergency response frameworks are not geared towards animal welfare and must be considered or sometimes altered when developing disaster preparation plans (Anthony & De Paula Vieira, 2022).

### ***Preparedness***

The preparedness phase of the One Health model takes into consideration how to define a responsible human to animal relationship during a crisis (Anthony & De Paula Vieira, 2022). Different types of disasters will have different definitions of what a responsible relationship looks like (Anthony & De Paula Vieira, 2022). During times where a pathogen is spreading heavier to various animal species it may be more responsible to focus more heavily on the animal welfare (Anthony & De Paula Vieira, 2022). During public health outbreaks like COVID it is clear human health should take priority. It can become more complicated during disasters like Hurricane Katrina with the solution being to evacuate the people (USDA, *Animal Care Emergency Programs*). However, many people refused evacuation services due to the fact there was no viable option to evacuate with their pets (USDA, *Animal Care Emergency Programs*). As a result, public health officials had to reevaluate their stance and include animal welfare and evacuation protocols (USDA, *Animal Care Emergency Programs*). The responsible relationship between animals and humans changes drastically depending on the type of disaster in the preparedness stage can help define those roles (Anthony & De Paula Vieira, 2022). The preparedness phase should help to guide the variety of roles and responsibilities for animal and non-animal organizations (Anthony & De Paula Vieira, 2022).

### ***Response***

During the response phase of the One Health model focus is prioritized on minimizing morbidity and mortality (Anthony & De Paula Vieira, 2022). First responders have a lot of pressure to make fast-acting ethical decisions that hopefully maximize lives saved and simultaneously keep themselves safe (Anthony & De Paula Vieira, 2022). This can be complicated because the roles that animals play during disasters can be extremely hard to recognize at the moment. Animals have the potential to be reservoirs for diseases while at the same time have the potential to require lifesaving assistance (Anthony & De Paula Vieira, 2022). Education and communication on the One Health model can help integrate helpful tools for first responders to utilize on deployment (Anthony & De Paula Vieira, 2022).

### ***Recovery and Reconstitution***

During this phase the impacts of the disaster can be assessed (Anthony & De Paula Vieira, 2022). The assessment should include a diverse portfolio of research that includes biological effects, impacted animal/human populations, environmental effects, the effects on disaster management team personnel, caretaker safety, and psychological impact for animals/human populations (Anthony & De Paula Vieira, 2022). One example of this is the Covid 19 pandemic, the lockdown created heightened linkages between humans and animal welfare (Anthony & De Paula Vieira, 2022). That heightened relationship should be studied and further understood so we can improve the One Health framework for the next pandemic.

The One Health model is a complete framework that recognizes the impact that animal and environmental health have on human health. This model attempts to address how to approach each disaster keeping in mind how animal welfare should be responsibly applied. The One Health approach may have started as a biological disaster approach, but it has grown into a format that can be utilized for any major disaster such as floods, earthquakes, or fires.

### **The World Organization for Animal Health**

The World Organization for Animal Health (OIE) was founded as the Office International de Epizooties in 1924 to improve overall public health by preventing the spread of animal diseases (WOAH, 2022). Over the last hundred years they have developed a mission to create a more sustainable and mutually beneficial environment by improving the health of animals globally (WOAH, 2022). Part of their approach includes the One Health model that recognizes the relationship between animal health, human health, and the environment (WOAH, 2022). Recent natural disasters and events have highlighted a need for a framework that veterinary professionals can utilize to develop their own disaster management plans (OIE, 2016).

### ***The World Organization for Animal Health Disaster Management Guideline***

OIE wanted to improve the culture within veterinary services to include preparation for disasters (Dalla Villa et al., 2020). In 2014, OIE began assisting 53 world organizations for animal health within Eastern European countries to improve the international standard for animal welfare in times of disaster (Dalla Villa et al., 2020). The OIE has developed a methodology for disaster management that integrates the mutual benefits of animal and

human health (WOAH, 2022). The OIE plan incorporates both national and international levels as well as a broad variety of stakeholders to create a disaster management plan that supports networks already in place (OIE, 2016). The importance of intra-and inter-institutional coordination is emphasized at every level (OIE, 2016). As well as intentionally designing plans that fall within the larger national legal framework for veterinary services (OIE, 2016). Legal logistics can vary from location to location, and it is important that each group utilizing the OIE disaster management guideline consider the specifics of local laws (OIE, 2016). Therefore, these guidelines should be used with some flexibility in mind to incorporate the multifaceted nature of disaster management and animal welfare (OIE, 2016). The OIE disaster management framework breaks the disaster management cycle into four phases: Mitigation and Prevention, Preparedness, Response, and Recovery (OIE, 2016).

### ***Mitigation and Prevention***

The mitigation phase utilizes lessons from previous disasters to develop prevention strategies and working relationships with existing organizations (OIE, 2016). The OIE disaster management guideline is most heavily focused in this mitigation phase (OIE, 2016). The success of later phases in the disaster management cycle heavily depends on the effectiveness of the mitigation process (OIE, 2016). Many government and nongovernment disaster management roles are already developed and in place on the local and national levels (OIE, 2016). Disaster managers can build off the already in place disaster management organizations and risk reduction plans (OIE, 2016).

Veterinary service contingency plans can be nestled into an overall veterinary service plan that connects national, regional, local, and private sector planning (See Appendix B). A thorough contingency plan includes the type of disaster being planned for, information on animal population, rapid assessment plan, legislation, detailed chain of command, details for coordination with other relevant government agencies, financial arrangements, human resource plan, communication plan, and established sustainability (OIE, 2016). Veterinary service professionals need to be included in mitigation conversations and take an active role in developing plans that include veterinary assistance for each level of the contingency plan (OIE, 2016).

The veterinary community needs to establish a leadership role when developing disaster management guidelines for animal welfare (OIE, 2016). Many professionals within the veterinary industry do not have clearly defined roles and responsibilities during times of disaster (OIE, 2016). A lot of the OIE mitigation process is centered around defining those roles and responsibilities for all phases of the disaster management cycle (OIE, 2016). Contingency plans can vary drastically depending on the type of disaster plan developed such as floods, fires, or disease outbreaks (OIE, 2016). The defining roles and responsibilities may change depending on the standard operating procedures of various contingency plans (OIE, 2016). The mitigation process for each contingency plan should be well-defined for the short and long-term (OIE, 2016).

Another reason the mitigation process is so important for the veterinary community is to include and educate as many stakeholders as possible (OIE, 2016). Veterinary stakeholders could include farmers, animal owners, veterinarians, pharmaceutical

industry, search/rescue services, food industry/producers, traders, slaughterhouses, laboratories, transportation, and volunteer associations (OIE, 2016). Many of these organizations are not outright linked with one another for disaster management purposes and will need guidance on how to be included in the disaster management plan (OIE, 2016). This will require communication strategies that include every level involved from stakeholders, the general public, and all government agencies (OIE, 2016).

Communication strategies should be a two-way path that allows stakeholders to include their needs and perspectives in the project (OIE, 2016). Communication should include clear and defined roles and responsibility for all key staff during every phase of the disaster management cycle (OIE, 2016). These roles should also include clear training and education for job responsibilities and where this position fits in the larger disaster management framework (OIE, 2016).

A detailed risk analysis should be concluded during the mitigation process to assess the specifics related to that region (OIE, 2016). A full detailed report should include hazard identification, hazard mapping, risk assessment, vulnerability analysis, capacity analysis, risk evaluation, and risk communication (OIE, 2016). Emergency services may change how they approach the relative risk of the situation depending on the current veterinary services and disaster management structures (OIE, 2016). For example, it is a lot easier to utilize animal search and rescue when a volunteer group is already established rather than having to develop it prior to implementation.

The same understanding can be applied to creating a budget (OIE, 2016). Identifying the sources of funding for risk management is critical to deciding which risk mitigation

strategies are possible (OIE, 2016). It is crucial during the mitigation phase to reasonably identify all available and not available outlets to effectively plan how to implement them (OIE, 2016).

The OIE guideline follows existing international legal frameworks based on the International Strategy for Disaster Reduction of the United Nations (OIE, 2016). This means any organization utilizing these guidelines must consider the national and local legislation that will affect how veterinary services can be performed (OIE, 2016). In many cases it is possible that specific veterinary service legislation has not been developed and will need to be implemented by government agencies (OIE, 2016).

### ***Preparedness***

The phase includes the earliest response for an impending disaster (OIE, 2016). A wide variety of contingency plans should have been developed in the mitigation phase allowing for veterinary services to activate as soon as a warning is received (OIE, 2016). The established command system should contact relevant agencies to implement the emergency mode of the desired contingency plan (OIE, 2016). Established leadership should assess current human resources and financial support as soon as the preparedness phase begins to guarantee resources are available to implement the contingency plan as is (OIE, 2016). The stronger the mitigation phase the easier the preparedness phase will be. However, things can change quickly, and flexibility may be required depending on resources available (OIE, 2016).

### ***Response***

Once the preparedness phase has implemented the desired contingency plan the response phase goes into effect (OIE, 2016). During this period the impact assessment and situation awareness should be conducted to prioritize with government officials and stakeholders the best use of resources (OIE, 2016). Steps taken during the mitigation phase should be used as guidance, but officials should recognize the ability to adapt quickly depending on the circumstances of reality (OIE, 2016).

### ***Recovery***

After any response plan is implemented veterinary officials and stakeholders should conduct a gap analysis (OIE, 2016). The gap analysis identifies any weaknesses within the contingency plan and allows for the development of more effective mitigation strategies in the future (OIE, 2016). The gap analysis needs to include feedback from significant stakeholders, leadership teams, and victims affected by the disaster (OIE, 2016). The gap analysis needs to analyze how current legislation or governments agencies hindered disaster management effectiveness (OIE, 2016). The gap analysis should also include an overall evaluation of the communication strategies implemented during the contingency plan (OIE, 2016). Being honest about monitoring and evaluating the success and failures of the response phase is the most important thing about the recovery phase because it gives disaster management researchers the strongest chance for improving the mitigation phase (OIE, 2016).

The World Organization for Animal Health Disaster Management Guideline is a liquid process developed to face the challenges brought with each new disaster. This guideline

covers public health, animal health, and the animal welfare aspects of disaster management (OIE, 2016). The OIE utilizes a One Health approach to combine existing structures with the veterinary community and their stakeholders. This approach is heavily fortified in the mitigation and preparation phase to establish clearly defined roles and communication strategies to implement veterinary services during a disaster (OIE, 2016).

### **Disaster management, Animal Welfare, and the Incident Command System**

The University of California as well as the World Society for Protection of Animals have created a disaster management plan that includes the established principles from the One Health methodology as well as keeping up the standards of the Federal Emergency Management Association (FEMA) and the OIE disaster management guidelines (Madigan & Dacre, 2009). Both the One Health model and the OIE disaster management guidelines stress the importance of creating solid communication between veterinarians within their communities as well as communication with government entities (Anthony & De Paula Vieira, 2022 and OIE, 2016). Many studies have shown that while both veterinary communities and non-animal related emergency responders lack the knowledge on how to participate during emergencies creating a large disconnect between available disaster management frameworks and communities that would like to help (Balieva & Ivanov, 2021, Huston & Ebers, 2020 , and Vroegindewey & Kertis, 2020). Incorporating the ICS into both disaster management planning and education practices could be the most effective tool for improving the knowledge and communication issues facing animal welfare and disaster management services today.

The ICS disaster management guide suggests that the veterinarians included in the contingency plans contain prior working knowledge of emergencies and disaster management protocols (Madigan & Dacre, 2009). Veterinarians are expected to have a knowledge of health and husbandry needs for a variety of species (Madigan & Dacre, 2009). Veterinarians should have a comprehensive knowledge of emergency procedures such as surgery or medical management for infections, wounds, burns, and shock (Madigan & Dacre, 2009). Veterinary practitioners should be updated on the health consequences of flooding, fire, and other natural disasters as well as treating exposure to toxic or hazardous substances (Madigan & Dacre, 2009). They should have the ability to perform humane methods of euthanasia (Madigan & Dacre, 2009). Once veterinarians are up to date on all required knowledge a training should be included that involves the Incident Command System of operations (Madigan & Dacre, 2009).

### **Incident Command System**

The Incident Command System (ICS) is a command structure responsible for the overall management of disaster preparation and response (Duke & Long, 2017). ICS is a standardized approach for the communication process for the command, control, and coordination for disaster management situations (Duke & Long, 2017). ICS creates a hierarchical structure that organizations can use to guide them to define roles and communication structures (Duke & Long, 2017). The structure is currently used at all levels of government and can be used for any contingency plan (Duke & Long, 2017). The ICS created for this disaster management platform was developed from the ICS

provided by the Federal Emergency Management Association (FEMA) with the addition of the OIE and One Health perspective (See Appendix C) (Madigan & Dacre, 2009).

The ICS approach identifies one veterinary staff member as the Incident Commander (Duke & Long, 2017). The Incident Commander is designed to create unity between multijurisdictional or multi agency disaster management by establishing one single Incident Commander for the disaster (Duke & Long, 2017). Each participating partner in the ICS is responsible for maintaining their authority and accountability for their specific tasks and simultaneously each member of the ICS is responsible for keeping other members informed (Duke & Long, 2017). Incident Commanders communicate to head command staff as well as leaders in the ICS general staff (Duke & Long, 2017). The command staff is typically comprised of a Public Information Officer, Safety Officer, and Liaison Officer (Duke & Long, 2017). The general staff are commanded by four subsections: operations, planning, logistics, and finance/administration (Duke & Long, 2017).

## **Command Staff**

### ***The Public Information Officer***

The command staff is typically comprised of a Public Information Officer, Safety Officer, and Liaison Officer (Duke & Long, 2017). The Public Information Officer is responsible for public and media representation (Duke & Long, 2017). The public will need to know additional information regarding public health safety and animal welfare (Duke & Long, 2017). The Public Information Officer is also responsible for keeping up

to date on what other various sources of media and public information are saying about public health safety and animal welfare (Duke & Long, 2017).

### ***The Safety Officer***

The Safety Officer is specifically in charge of safety for incident personnel (Duke & Long, 2017). This veterinary official should understand the hazards that come with a specific contingency plan (Duke & Long, 2017). They will need to be able to assess, communicate, and mitigate hazardous environments in a rapidly changing situation (Duke & Long, 2017). Their overall goal is to prevent or stop unsafe approaches to disaster management efforts (Duke & Long, 2017).

### ***The Liaison Officer***

The Liaison Officer acts as a point of contact for organizations that are outside of veterinary services such as governmental agencies, jurisdictions, NGOs, and private sector organizations (Duke & Long, 2017). The ICS works to structure veterinary components in an efficient way (Duke & Long, 2017). The Liaison Officer simplifies the chain of communication to one person who can then direct the desired information to the correct organizational structure (Duke & Long, 2017). This role tends to be large and sometimes requires adding on additional assistance to the Liaison Officer (Duke & Long, 2017).

## **General Staff**

### ***Operations***

Operations involves a variety of divisions broken down into strike teams, task forces, and single resource sources (Duke & Long, 2017). These groups will be actively utilizing boots on the ground during the disaster (Duke & Long, 2017). The Operations Section Chief should be selected based on the type of disaster, organizations involved, and the required priorities, objectives, and strategies (Duke & Long, 2017). The veterinary professional in this position should be able to implement strategies and tactics specific to that disaster (Duke & Long, 2017).

### ***Planning***

The planning section is broken up into four units: resources, situation, demobilization, and documentation (Duke & Long, 2017). These units are responsible for organizing situational information and relaying it to the Incident Commander (Duke & Long, 2017). They should be monitoring resources and anticipating future resource needs (Duke & Long, 2017). The documentation used in the planning section is important for communication during a disaster as well as analyzing the effectiveness of the disaster management efforts (Duke & Long, 2017).

### ***Logistics***

The logistics section takes responsibility for ongoing incident management (Duke & Long, 2017). The logistics section is broken into eight subsections: service branch, support branch, communication unit, supply unit, medical unit, facilities unit, food unit,

and a ground support unit (Duke & Long, 2017). Each group is responsible for ordering and processing their related resources (Duke & Long, 2017). They are responsible for setting up, maintaining, securing, and demobilizing all facilities related to their specific unit (Duke & Long, 2017).

### ***Finance and Administration***

The finance and administration section is designed to take care of incident management activities and supportive care services (Duke & Long, 2017). Broken up into four subunits time, securement, costs, and compensation claim, the finance and administration section take care of every aspect of the financial burdens included in the ICS as well as the contingency plan (Duke & Long, 2017). These roles include tracking costs, recommending cost saving alternatives, managing leasing and vendor contracts, recording time for incident personnel and leased equipment, analyzing financial concerns, and any reimbursement grant funding (Duke & Long, 2017).

### **Disaster Management Guidelines Utilizing Incident Command System**

This disaster management guide breaks down the disaster management cycle into four components: mitigation, preparedness, response/emergency relief, and recovery (Madigan & Dacre, 2009). Each phase in the disaster management cycle should involve a contingency plan that includes an ICS communication structure (Madigan & Dacre, 2009).

### ***Mitigation***

The mitigation process for veterinary personnel should involve establishing as much groundwork as possible to reduce overall impact on animal welfare (Madigan & Dacre, 2009). Some of the most basic risk reduction measures include proper storage and protection of food, water, and medical supplies (Madigan & Dacre, 2009). Mitigation teams should analyze what would be required depending on disasters in their region (Madigan & Dacre, 2009).

Some examples of this would be if the contingency plan was centered around a flooding disaster (Madigan & Dacre, 2009). First personnel need to decide which animals will need to be targeted for evacuation such as companion animals or livestock (Madigan & Dacre, 2009). Evacuation requires a lot of additional support such as transportation, areas of safety that are appropriate for the desired species, food, medical care, and a lot of specialized equipment (Madigan & Dacre, 2009). If animals during evacuation processes have been lost or separated it is important to find a way to identify and return animals to their proper home (Madigan & Dacre, 2009). Animal shelters may need additional support to house displaced animals (Madigan & Dacre, 2009).

Electricity or other sources of power are not always available during a flood it is common during disasters to lose power and require backup resources (Madigan & Dacre, 2009).

Veterinary personnel in this phase need to ask themselves how loss of power or other likely inconvenient scenarios will affect their ability to perform tasks such as evacuation (Madigan & Dacre, 2009). Rising water and the combination of wildlife could increase the chances of things like the spread of leptospirosis (Madigan & Dacre, 2009).

Veterinary personnel should analyze if waterborne diseases like leptospirosis pose a large enough risk that a vaccination is in order (Madigan & Dacre, 2009). All of these are just examples for scenarios in just one type of disaster, each disaster should receive as much thought and attention.

### ***Preparedness***

Veterinary personnel should assess and prepare for all contingency options deliberated in the mitigation phase (Madigan & Dacre, 2009). For example, the logistics of a successful evacuation requires working parts from both animal and nonanimal first responders (Madigan & Dacre, 2009). The preparation phase should have an evacuation plan completely establish long before an actual disaster is present (Madigan & Dacre, 2009). This is also a good time to raise awareness within community efforts (Madigan & Dacre, 2009). People need to have time to become familiar with disaster preparation efforts and community warning systems (Madigan & Dacre, 2009).

### ***Response and Emergency Relief***

There are five major emergency relief efforts that veterinary services are frequently utilized for (Madigan & Dacre, 2009). Search and rescue for animals and humans, arranging temporary shelters for displaced or evacuated animals, housing displaced livestock, medical support, and preventative interventions for zoonotic diseases (Madigan & Dacre, 2009).

Logistics teams need to be trained ahead of time on how to accomplish all these goals depending on the type of disaster the contingency plan is for (Madigan & Dacre, 2009).

Additional training should include how to catch large animals, handling trapped or injured animals, and specific housing requirements for stressed and/or injured animals (Madigan & Dacre, 2009).

Veterinary personnel can utilize a variety of international and national agencies that are already in place such as the World Society for the Protection of Animals, the Humane Society, The International Fund for Animals, and the Federal Emergency Management Agency (Madigan & Dacre, 2009). Many of these organizations contain additional training modules and educational courses (Madigan & Dacre, 2009).

### ***Recovery***

The priority of the recovery phase is to return living conditions to as normal as possible (Madigan & Dacre, 2009). Many animals that have been displaced during this time will need to be identified and returned to owners (Madigan & Dacre, 2009). Animal husbandry may need to be provided to restore animal welfare (Madigan & Dacre, 2009).

The University of California as well as the World Society for Protection of Animals created a thorough methodology for designing a disaster contingency plan with veterinary services and experience in mind. The ICS is a great addition to the OIE guideline because it allows veterinarians to see a complete communication structure, they can plug their intended roles into. Previous surveys have suggested that there is a lack of communication, understanding, and training within the disaster management framework (Balieva & Ivanov, 2021, Huston & Ebers, 2020, and Vroegindewey & Kertis, 2020). This guideline seems to be the most effective at addressing those issues while still

including a One Health perspective and upholding OIE standards (Madigan & Dacre, 2009).

### **Veterinary Emergency Group Travel Team**

The Veterinary Emergency Group (VEG) travel team, established in May of 2021, is a dedicated group of 25 Veterinarians and 13 Veterinary Nurses who practice veterinary medicine nationwide. The team's primary responsibility is to provide high-quality emergency veterinary care to VEG locations across the country and play a crucial role in educating fellow professionals on current emergency veterinary medicine. With their ability to respond swiftly to hospital needs and travel to different locations, the team is well-equipped to handle emergency situations and adapt to the new environments and situations required for disaster relief care.

The team currently lacks specific certifications in disaster relief work. Their licensing is limited to states with VEG locations and will require additional medical licenses to practice in additional states. To ensure their optimal contribution during disasters, additional training, supplies, and evaluation would be required to equip the team with the necessary skills and resources for disaster relief. VEG does provide funding for unlimited continuing education opportunities for their medical team and is set up to provide any additional disaster relief training needed to create this program.

The VEG travel team's strengths lie in their extensive veterinary expertise, adaptability, and their ability to provide rapid response in emergency situations. Moreover, their capacity to work in unfamiliar locations and collaborate with new colleagues allows them to quickly integrate into different emergency environments. Their ability to fly out at a

moment's notice demonstrates their preparedness to handle urgent veterinary needs across the country.

### **CHAPTER 3: Methods**

This section will outline the methodology that was employed to develop a comprehensive disaster management plan for veterinary emergency services. The methodology drew upon the expertise and information derived from various sources, including the World Organization for Animal Health (OIE), the Incident Command System (ICS), and the insights provided throughout this discussion. The primary objective was to establish a structured disaster management plan for the emergency veterinary community. The methodology encompassed several key steps, including defining the scope and objectives, conducting a risk assessment, reviewing existing guidelines, engaging stakeholders, developing a disaster management framework, and implementing contingency plans across the mitigation, preparedness, response, and recovery phases. Additionally, the methodology emphasized the ongoing evaluation, documentation, training, and continuous improvement to ensure the plan remains effective and adaptive in the face of evolving challenges and circumstances.

#### **Scope And Objectives**

Using the tools laid out in this methodology the scope of the disaster relief plan was easily defined. Each disaster is different so the scope of each new plan will focus on objectives that enhance disaster response capabilities, and improve the communication and coordination. The contingency plan used the ICS to pre-designate an Incident Commander who will develop the scope and objectives for each new disaster.

### **Conducting A Risk Assessment**

The contingency plan included a guideline for conducting a risk assessment for disasters by accessing stakeholder knowledge, historical data, local demographics, and geographical factors to understand the most likely risks and their potential impact on animal populations. The plan utilized the recommendations from organizations like FEMA's emergency response team to identify potential hazards, vulnerabilities, and risks associated with various disaster scenarios. The plan included recommendations to evaluate factors such as natural disasters, disease outbreaks, and other emergencies that could impact veterinary services and animal welfare. As well as guided in assessing the potential consequences of these hazards on animal health.

### **Reviewing Existing Guidelines**

Legislation played a crucial role in disaster relief work and the inclusion of veterinary services and animal welfare. The FEMA Disaster Assistance Policy created through the Stafford Disaster Relief and Emergency Assistance Act as well as the Pets Evacuation and Transportation Standards Act (PETS Act) of 2006 was important for maintaining existing legal guidelines.

The disaster relief program focused on providing veterinary medical care during disasters while adhering to FEMA's Disaster Assistance Policy as well as state and national legal guidelines. By aligning the VEG Travel Team's strengths and expertise with the FEMA guidelines, the disaster relief program planned to provide effective and efficient veterinary medical care during disasters to the locations that need it most. Continuous coordination and communication with FEMA representatives will be essential to

maximize funding opportunities and ensure the successful implementation of the program. If the contingency plan adheres to the existing guidelines, veterinary hospitals are eligible to receive federal funding to practice emergency medicine both within their own hospital or by setting up teams in local shelters during disaster situations.

Currently federal funding is available for veterinary practices during emergency scenarios who provide the following services: veterinary diagnosis, triage, treatment, and stabilization. The contingency plan outlined training that included rapid assessments, diagnose medical conditions, prioritize cases based on urgency, and administer appropriate treatments to stabilize injured or ill animals. This included immediate medical interventions to alleviate pain, control bleeding, stabilize fractures, manage respiratory distress, and address other urgent medical needs.

### **Engaging Stakeholders**

The contingency plan included extensive knowledge on engagement with stakeholders prior, during, and after disaster relief aid is administered. This has allowed for a contingency plan that grows and develops based on the communication and results from previous engagements. This included established relationships with government agencies, Veterinary Associations and Organization, Veterinary Colleges. A full list of example stakeholders and contact information in Appendix E.

### **Developing A Disaster Management Framework**

The contingency plan was designed to appoint the Incident Commander to develop a management framework that is appropriate for the scope and objectives of each individual disaster. The Incident Commander, Public Information Officer, Liaison Officer, and Safety Officer work directly with the established stakeholders to define the needs and requirements for all aspects of the relief work VEG is participating in. From there, the contingency plan further defined their management structure within operations, planning, logistics, and finance/administration based on the individual needs of each disaster. Some of these roles within the management framework can also be filled by stakeholder groups and organizations as well as VEG themselves.

### **Implementing Contingency Plans**

The contingency plan developed details for implementing contingency plans that engaged in all phases of disaster relief work including the mitigation/prevention, preparedness, response, and recovery phases. This work must be done prior, during, and post disaster to further create a program that continuously emphasizes ongoing evaluation, documentation, training, and continuous improvement.

### ***Mitigation***

The contingency plan prioritized education and training initiatives to build the capacity of their team members and other stakeholders involved in the disaster relief program. This included providing continuing education on disaster relief programs provided through stakeholders. The contingency plan also encouraged collaborating with veterinary

schools, colleges, and professional associations to develop and deliver specialized training programs for veterinary professionals and volunteers involved in the response efforts.

The contingency plan established a resource management guide to ensure the availability and proper allocation of essential resources during emergencies. Resources are regularly reviewed and updated to their resource management protocols to adapt to changing circumstances and emergent needs. The contingency plan suggested regularly evaluating the effectiveness of their contingency plans and making necessary adjustments based on the feedback from stakeholders and the VEG team. This included conducting post-disaster reviews to identify areas for improvement and update their mitigation strategies accordingly.

### ***Preparedness***

The contingency plan created guides for comprehensive Standard Operating Procedures (SOPs) that outline the roles, responsibilities, and protocols to be followed by team members during a disaster. These SOPs covered various aspects, including resource management, triage procedures, medical treatment protocols and communication channels. The SOP was outlined in a way that VEG can establish reliable communication networks to facilitate real-time information sharing among team members, local authorities, and other response organizations. This may involve utilizing radios, mobile communication systems, online platforms, and social media channels to ensure efficient and coordinated communication before, during, and after a disaster.

The contingency plan utilized educational programs for its team members to ensure they are equipped with the necessary knowledge and skills to respond effectively during a disaster. The plan suggested consulting with other stakeholders to develop a proactive veterinary disaster relief training program. This training may include emergency medical procedures, disaster response protocols, personal safety measures, and coordinated communication strategies including the ICS. Training may also look like developing response drills and exercises to further train the VEG team. VEG will potentially work with stakeholders to conduct disaster response drills and exercises to simulate emergency situations and test the effectiveness of their contingency plan. These simulations have helped identify areas for improvement, refine response strategies, and enhance team coordination and communication.

### ***Response***

The contingency plan guided the team on how to activate their emergency response upon receiving notification or confirmation of a disaster from previously defined stakeholders such as government agencies. The contingency plan suggested that team members be notified, and their roles and responsibilities be assigned based on their expertise and the specific needs of the situation. Once the needs of each specific disaster have been established, the contingency plan guided personnel how to mobilize their resources, including personnel, equipment, and supplies, to the affected area.

The contingency plan suggested establishing clear communication channels to coordinate with local authorities, other response teams, and stakeholders. This plan allowed for emergency groups to work together to ensure a unified approach to veterinary care, avoid

duplication of services, and maximize the impact of their response. Veterinary professionals were encouraged to continuously monitor the evolving situation and assess the effectiveness of their response efforts. They would remain flexible and adaptive, making necessary adjustments to their plans and strategies based on the changing needs and challenges encountered during the response phase.

The contingency plan was built around the services that VEG could perform with government assistants. This created a contingency plan to provide emergency medical treatment to injured or ill household pets. This included triage, stabilization, wound care, pain management, and administration of necessary medications. The plan includes guidelines to document the veterinary services provided, including medical treatments, surgeries, vaccinations, and any other interventions, and to maintain accurate records for future reference and reporting.

### ***Recovery***

Finally, the contingency plan centered around staff's evaluation of their disaster response activities during the recovery phase. Personnel were instructed to collect and analyze data related to the impact of the disaster on animal health, the effectiveness of their response efforts, and any lessons learned. They are to identify areas of improvement, evaluate the effectiveness of their contingency plan, and make necessary adjustments to enhance their future response capabilities. This information was designed to help improve future disaster preparedness and response strategies.

## CHAPTER 4: Results

The results section of this thesis presents a structured disaster management plan for the emergency veterinary community. The chapter focuses on various categories that form the foundation of an effective disaster management plan. These categories include defining the scope and objectives, conducting a risk assessment, reviewing existing guidelines, engaging stakeholders, developing a disaster management framework, implementing contingency plans, addressing the mitigation, preparedness, response, and recovery phases, and conducting post-evaluations for future adaptation.

In the section on defining the scope and objectives, the essential steps are established to create clear goals and boundaries for the contingency plan. This includes identifying the specific objectives that enhance disaster response capabilities and improve communication and coordination among veterinary emergency teams. The risk assessment category delves into the importance of identifying and understanding the unique characteristics, challenges, and risks associated with various disaster scenarios. By conducting a comprehensive risk assessment, veterinary emergency teams can effectively mitigate potential hazards and vulnerabilities. Reviewing existing applicable state and federal guidelines allows teams to leverage established best practices and incorporate them into their contingency plan. It provides a valuable foundation of knowledge and expertise to enhance the team's disaster management strategies. Engaging stakeholders is crucial for a collaborative approach in disaster management. Involving veterinary professionals, disaster management authorities, public health agencies, and

community organizations ensures a holistic perspective and access to necessary resources and support. A full list of stakeholders and contacts are included in Appendix E.

The development of a disaster management framework establishes a structured plan that guides the team's actions during emergencies. It includes considerations for communication, coordination, and response capabilities, with the primary objective of saving lives and mitigating the impact on both human and animal health. Implementing contingency plans encompasses the critical phases of mitigation, preparedness, response, and recovery. Each phase plays a significant role in enhancing the team's readiness, resilience, and effectiveness in managing veterinary emergencies during disasters. Finally, post-evaluations for future adaptation allow teams to reflect on their response efforts, identify areas for improvement, and implement necessary changes. It emphasizes the importance of continuous evaluation, learning, and adaptation to ensure that the contingency plan remains effective and responsive to evolving challenges.

### **Define Scope and Objectives**

When a disaster emerges the first thing that veterinary personnel should look at is defining the scope and measurable objectives of the current emergency. They should begin by assessing the specific disaster including type, geographic location, and lessons learned from previous data. From that information they can go on to define the scope of the contingency plan as well as determine the objectives to enhance disaster response capabilities.

### ***Assess the Specific Disaster Situation***

Gather all relevant information about the specific disaster scenario. Understand the unique characteristics, challenges, and risks associated with the disaster. Relevant information should include type of disaster, geographic location, relevant historical data and patterns, stakeholder engagements, and any previous case studies relevant to the specific disaster.

#### **Type of Disaster**

In the process of rebuilding the scope and objectives section for disaster management, it is crucial to conduct comprehensive research on the specific type of disaster occurring. This involves delving into the intricacies of the disaster, such as hurricanes, earthquakes, floods, disease outbreaks, industrial accidents, or man-made incidents. Researchers should aim to gain a deep understanding of the unique characteristics, challenges, and risks associated with each disaster scenario.

During this research phase, investigators need to identify and analyze critical factors such as the historical occurrence of similar disasters in the region, the geographical and climatic conditions that might exacerbate the impact, and the vulnerable populations that could be affected. They should explore the potential environmental and ecological consequences of the disaster on both humans and animals, as well as the existing infrastructure and resources available for emergency response and recovery efforts.

Lastly, investigate the previous disaster response strategies employed in similar situations and their outcomes, drawing insights from past successes and lessons learned to inform the development of an effective contingency plan. By gathering all relevant information related to the specific disaster, a solid foundation can be established to define the scope and objectives of the disaster management plan, ensuring it is tailored to the unique demands and requirements of the situation at hand.

### **Geographic Location**

Study the geographical location where the disaster is occurring or likely to occur. Factors such as climate, topography, infrastructure, and population density can significantly impact the severity and consequences of the disaster. This research will help identify the specific vulnerabilities and risks that may arise in that area.

### **Historical Data and Patterns**

Analyze historical data and patterns of similar disasters in the region. Look for trends, common challenges, and lessons learned from previous events. This information will provide valuable insights into the unique characteristics and challenges associated with the specific disaster and help anticipate potential risks and consequences.

### **Stakeholder Engagement**

Engage with relevant stakeholders who have experience or expertise in dealing with similar disasters. This may include local government agencies, public health organizations, veterinary professionals, emergency responders, and community leaders. Consultation with these stakeholders will help identify the local context,

identify specific challenges, and gather valuable insights into the risks and opportunities for effective disaster management.

### **Previous Case Studies**

Study case studies and reports from previous disasters, both nationally and internationally, that share similarities with the current situation. Analyze the challenges faced, successful interventions, and areas for improvement in those cases. To find previous case studies on veterinary emergency management and disaster response, consider checking academic databases, renowned veterinary journals such as JAVMA and Journal of Veterinary Emergency and Critical Care, websites of organizations like World Vets and AVMA, government agencies like FEMA, veterinary colleges/universities, and attending relevant conferences and symposiums. These sources offer valuable insights and research findings that help develop informed strategies for effective disaster management.

### ***Define the Scope of the Contingency Plan***

Identify the boundaries and parameters of the plan based on the geographical area, type of disaster, and resources available for response and recovery efforts.

#### **Geographical Area**

Define the affected geographical area by considering the extent of the disaster's impact. This could range from a localized area, such as a neighborhood or town, to a larger region or even multiple regions. Consider the geographic boundaries, such as geographical features, transportation routes, or administrative divisions, that may affect the response and recovery operations. Include any unique

characteristics of the area, such as high-risk zones, sensitive ecosystems, or critical infrastructure, which may require specific attention and planning.

### **Type of Disaster**

Assess the specific characteristics and requirements of the disaster type. Different types of disasters pose varying risks and challenges, requiring tailored approaches. Identify the primary hazards and associated consequences related to the disaster type. This includes understanding the potential impacts on human and animal health, infrastructure, environment, and community well-being. Consider the timeline and progression of the disaster. Some disasters may unfold rapidly, while others may have a prolonged duration, influencing the scope and duration of the plan.

### **Resources Available for Response and Recovery Efforts**

Evaluate the available resources, both internal and external, that can be utilized for response and recovery efforts. This includes assessing the capacities of veterinary personnel, equipment, facilities, and supplies. Identify any potential resource gaps or limitations that may affect the response and recovery operations. This includes categorization of resources based on the type of disaster. This could include shortages of personnel, specialized equipment, or specific expertise. Consider the support and collaboration that can be sought from external entities, such as governmental agencies, non-governmental organizations, or other veterinary and public health stakeholders.

### ***Determine Objectives to Enhance Disaster Response Capabilities***

Identify specific goals and objectives that align with the scope of the plan. Consider the resources, expertise, and infrastructure available for disaster response. Analyze the challenges and gaps identified in the assessment of current response capabilities. As well as linking the previously defined objectives to the needed resources. Determine the areas where improvements are most needed to enhance the overall response effectiveness. This assessment helps identify the baseline from which objectives can be developed to enhance these capabilities.

Establish clear and measurable objectives that align with the defined scope. These objectives should be specific, achievable, relevant, and time bound. Examples of objectives could include improving triage procedures, implementing effective animal evacuation protocols, enhancing communication systems, and strengthening partnerships with local emergency response agencies.

### ***Document the Scope and Objectives***

Clearly document the defined scope and objectives for the contingency plan. Ensure the documentation is accessible to all relevant team members and stakeholders.

### ***Regularly Review and Update the Scope and Objectives***

Continuously evaluate the effectiveness of the contingency plan. Regularly update the scope and objectives based on lessons learned, changes in regulations, and emerging best practices.

## **Conduct Risk Assessment**

Conducting a comprehensive risk assessment specific to a disaster is crucial for understanding potential hazards, vulnerabilities, and risks. A complete risk assessment that identifies potential hazards, vulnerabilities, and risks associated with each new disaster scenario. As well as documents and communicates assessment findings.

### ***Identify Potential Hazards***

To better identify potential hazards, gather information on the specific disaster scenario to identify potential hazards associated with it. For natural disasters, such as earthquakes, consider the seismic activity history of the region, local geological conditions, and susceptibility to landslides. In the case of hurricanes, investigate historical data on storm intensity, wind patterns, and storm surges. For floods, analyze river flow data, rainfall patterns, and past flood occurrences.

When dealing with human-made disasters, such as chemical spills, gather information on the types of industries or facilities in the area that handle hazardous materials and assess their safety protocols. In the event of disease outbreaks, study the prevalence of specific diseases in the region, the population density of susceptible animals, and potential vectors for transmission.

Include historical data, local reports, expert opinions, and relevant studies to determine the range of hazards that could occur in the affected geographical area. Document the identified hazards, ensuring a comprehensive and accurate understanding of the potential threats for the development of an effective veterinary emergency management plan.

### ***Identify Vulnerabilities***

Evaluate how these hazards create vulnerabilities within the veterinary services or organization that could be exposed to the identified hazards. This includes examining the weaknesses or deficiencies in infrastructure, systems, resources, and preparedness measures. Consider factors such as the physical location of facilities, availability of critical supplies, staffing capacity, training levels, and communication systems. Assess the vulnerabilities in terms of their potential impact on disaster response and the ability to effectively mitigate and recover from the identified hazards.

### ***Analyze Risks***

Combine the information gathered on hazards and vulnerabilities to analyze the specific risks associated with the disaster scenario. Evaluate the likelihood of each hazard occurrence and the potential consequences it could have on the veterinary services, staff, animals, and the surrounding community. Consider the interdependencies between various risks and their potential cascading effects on response and recovery efforts. Use risk assessment methodologies and tools, such as probability-impact matrices or risk scoring systems, located in appendix D, to prioritize and quantify the identified risks.

### ***Document and Communicate Findings***

Document the findings of the risk assessment process in a clear and organized manner. This includes creating a risk register or report that outlines the identified hazards, vulnerabilities, and risks. Clearly describe the nature of each hazard, the vulnerabilities that may be exploited, and the potential consequences and impacts associated with the

identified risks. Communicate the risk assessment findings to key stakeholders within the veterinary team, relevant authorities, and other involved parties. This ensures a shared understanding of the risks and facilitates collaborative decision-making and resource allocation.

Insights gained from the risk assessment to inform the development of mitigation measures and strategies. Identify specific actions and interventions that can reduce the likelihood of hazards occurring, minimize vulnerabilities, and mitigate the potential impacts of identified risks. Prioritize the mitigation measures based on their effectiveness, feasibility, and alignment with the overall objectives and resources available. Continuously review and update the risk assessment as new information becomes available or the disaster scenario evolves.

### **Review Existing Guidelines**

Research legal and regulatory framework related to disaster management in the region. This includes relevant authorities, laws, policies, guidelines, and protocols that govern disaster response and veterinary services. Identifying the roles and responsibilities of the veterinary community. As well as staying up to date on all current changes.

### ***Identify Relevant Authorities***

Determine the key authorities responsible for disaster management in the region, such as government agencies, departments, or organizations. These entities may include emergency management agencies, public health departments, or veterinary regulatory

bodies. Research and compile a list of the relevant authorities to ensure a comprehensive understanding of the entities involved in both disaster response and veterinary services.

### ***Review Applicable Laws and Regulations***

Conduct a thorough review of the laws and regulations related to disaster management in the region. These may include specific legislation or acts that outline the legal framework for disaster response and veterinary services. Identify the provisions that directly pertain to the veterinary sector, animal health, and emergency response during disasters. Pay attention to specific requirements, obligations, and protocols outlined in the legislation, such as reporting procedures, resource allocation mechanisms, or coordination mechanisms with other agencies.

### ***Explore Policies, Guidelines, and Protocols***

Research and explore policies, guidelines, and protocols that have been developed to support disaster management efforts in the region. These documents provide practical guidance and instructions for implementing effective disaster response measures. Look for policies and guidelines specific to veterinary services, animal welfare, and the role of veterinary professionals in disaster situations. Analyze these documents to understand the recommended best practices, standards, and procedures for veterinary disaster management.

### ***Identify Roles and Responsibilities:***

Determine the roles and responsibilities assigned to the veterinary sector within the legal and regulatory framework. This includes identifying the specific tasks and functions that

veterinary professionals are expected to perform during disaster response and recovery. Identify the coordination mechanisms established between veterinary services and other relevant entities, such as public health agencies or emergency management organizations. Clarify the reporting lines, communication protocols, and collaboration requirements outlined in the legal and regulatory framework.

***Stay Updated on Changes:***

The legal and regulatory framework for disaster management is subject to revisions and updates over time. Establish a system for staying informed about any changes or amendments to the laws, policies, guidelines, and protocols. This can involve regular monitoring of government websites, official announcements, or subscribing to relevant newsletters or publications. Ensure that the veterinary disaster management team remains up to date with the latest legal requirements, ensuring compliance and alignment with the evolving legal and regulatory landscape. A list of relevant government websites and legal regulation suggestions are available in appendix E.

**Engage Stakeholders**

Engage key stakeholders, including veterinary professionals, disaster management authorities, public health agencies, and community organizations. Regular communication and ongoing collaboration with stakeholders are key to maintaining strong relationships. This includes organizing meetings, workshops, and training sessions to facilitate knowledge exchange, joint planning, and capacity building. By nurturing these relationships, a network of support can be established that strengthens disaster

management capabilities and enhances the collective ability to respond effectively to veterinary emergencies.

During the actual disaster contingency plan development stakeholders should be included in communication and information sharing, joint planning and decision-making, resource mobilization, mutual aid and support, public awareness and education, and after-action review.

### ***Communication and Information Sharing***

Establish clear communication channels with stakeholders, including disaster management authorities, public health agencies, and other relevant organizations.

Regularly exchange information on the status of veterinary services, available resources, and emerging needs. This real-time information sharing promotes situational awareness and enables stakeholders to make informed decisions.

### ***Joint Planning and Decision Making***

Collaborate with stakeholders to develop and implement coordinated response plans.

Engage in joint planning meetings to discuss priorities, allocate resources, and coordinate activities. By involving stakeholders in decision-making processes, veterinary professionals can benefit from diverse perspectives and ensure a comprehensive approach to disaster response.

***Resource Mobilization***

Work closely with stakeholders to identify and mobilize necessary resources for veterinary services. This includes equipment, supplies, personnel, and logistical support. By engaging with stakeholders, veterinary professionals can tap into additional resources and enhance their capacity to provide comprehensive care to animals affected by the disaster.

***Mutual Aid and Support***

Establish mutual aid agreements and protocols with neighboring veterinary clinics, animal shelters, and veterinary organizations. These agreements facilitate the sharing of resources, expertise, and personnel during emergencies. Engaging with stakeholders in this way promotes a unified response and maximizes the available resources for veterinary care.

***Public Awareness and Education***

Collaborate with stakeholders to develop and disseminate public awareness campaigns and educational materials related to animal safety and disaster preparedness. By working together, veterinary professionals can leverage the reach and influence of stakeholders to promote locations for emergency services, evacuation plans for animals, and other essential information to protect both human and animal lives.

### ***After-Action Review***

Engage in post-disaster evaluation and review processes with stakeholders. This collaborative assessment allows for the identification of lessons learned, areas for improvement, and best practices. By involving stakeholders in this feedback loop, veterinary professionals can continually enhance their disaster response capabilities and ensure ongoing coordination for future emergencies.

### **Develop Disaster Management Framework**

To develop a comprehensive disaster management framework the following will need to be established. Getting to know the incident command system (ICS), how to adapt the ICS for specific veterinary disaster management concerns, establish the incident command, develop a standing operating procedure, establish communication channels, conducts training exercises, and continuously evaluate to improve existing management framework.

### ***Get to know the Incident Command System (ICS)***

Gain a thorough understanding of the principles, structure, and components of the ICS. This includes knowing the roles and responsibilities of key positions such as the Incident Commander, Operations Section Chief, Planning Section Chief, Logistics Section Chief, and Finance/Administration Section Chief. Have a firm understanding of the standardized ICS organizational structure, communication protocols, and decision-making processes. The disaster management framework must fit into the communication style of the ICS. Information for FEMA ICS courses are in Appendix E.

### ***Adapt the ICS for Veterinary Disaster Management***

Assess the specific needs and requirements of veterinary services during a disaster.

Identify how the ICS can be tailored to address these unique challenges. Consider the roles and responsibilities specific to veterinary professionals, such as veterinary care, triage, and transportation of animals. Determine how the ICS can integrate with existing veterinary systems and protocols to ensure seamless coordination and communication.

### ***Establish the Incident Command***

Designate an Incident Commander (IC) who will have overall authority and responsibility for managing the veterinary disaster response effort. Ensure that the IC has the necessary training and experience to fulfill this role effectively. Assemble a multidisciplinary team of veterinary professionals to support the IC and fulfill key roles within the ICS structure. This team should include individuals with expertise in operations, planning, logistics, and finance/administration.

### ***Develop Standard Operating Procedures (SOPs)***

Create clear and concise SOPs that outline the specific procedures, protocols, and guidelines for veterinary services within the ICS framework. These SOPs should cover areas such as animal triage, medical treatment, resource management, and communication. Ensure that the SOPs align with the principles of the ICS and are compatible with the overall incident scope and objectives.

Identify the key processes and tasks that need to be performed during a disaster. This includes triage and treatment protocols, communication procedures, equipment usage,

and coordination with other response agencies. Clearly outline step-by-step procedures for each critical process. Use concise and easy-to-understand language, ensuring that each step is detailed enough to guide responders without being overwhelming. SOPs should be organized in a logical manner, making them easy to navigate and reference during high-stress situations.

Conduct thorough training sessions to ensure all team members are familiar with the SOPs and understand their roles and responsibilities. Before actual implementation, validate the drafted SOPs with the users of the disaster management plan, including veterinary professionals and other stakeholders. Gathering feedback from these individuals will contribute to content validity, ensuring that the SOPs are relevant, accurate, and appropriate for the specific disaster scenario.

Share the drafted SOPs with the team and stakeholders for review and feedback. Incorporate their suggestions to improve clarity, completeness, and practicality. Regularly revisit and update the SOPs to reflect evolving knowledge, technology, and lessons learned from previous disaster responses. Encourage open communication among team members to gather insights and make necessary revisions to the procedures.

By validating SOPs through feedback and collaboration with users, the disaster management team can enhance the credibility and usability of the procedures, promoting effective response and maximizing the potential for successful outcomes during emergencies.

### ***Establish Communication Channels***

Identify and establish effective communication channels within the ICS structure. This includes designated communication protocols for internal veterinary team communication as well as external communication with other ICS elements, stakeholders, and relevant agencies. Implement redundant communication systems to ensure reliable and continuous communication, considering the potential challenges posed by a disaster environment.

### ***Conduct Training and Exercises***

Provide comprehensive training on the ICS and the veterinary-specific components of the disaster management framework to all relevant veterinary professionals. Conduct regular exercises and simulations to practice implementing the ICS and test the effectiveness of the veterinary disaster management framework. These exercises should involve coordination with other response agencies and stakeholders to simulate real-world scenarios.

### ***Continuously Evaluate and Improve***

To ensure the effectiveness and adaptability of the disaster management framework, establish mechanisms for both formative and summative evaluation. During the customization and implementation of the contingency plan, conduct formative evaluations to assess its alignment with specific disaster scenarios, stakeholder requirements, and available resources. Solicit feedback from veterinary professionals and stakeholders to identify potential improvements and make necessary adjustments before full implementation.

Following the post-implementation of the contingency plan, conduct summative evaluations, such as after-action reviews, to assess its performance during real incidents. Identify strengths, areas for improvement, and lessons learned from actual disaster responses. Incorporate insights from veterinary professionals, stakeholders, and participants to enhance the framework and address any identified gaps or deficiencies.

Regularly update the Standard Operating Procedures (SOPs) and training materials based on evolving best practices, changes in regulations, and the lessons learned from previous incidents. Continuous evaluation and improvement will enable the Veterinary Emergency Team to remain agile and well-prepared, bolstering their response capabilities and ensuring effective management of future disaster scenarios.

### **Implement Contingency Plans**

To ensure an effective response, comprehensive contingency plans must be implemented. The guideline developed encompasses various aspects, such as plan activation, communication and coordination, resource mobilization, triage and treatment, the Incident Command System, continual assessment and adaptation, support for veterinary personnel, documentation and reporting, post-disaster recovery, and continuous improvement. These elements collectively contribute to a structured and well-coordinated disaster management approach for veterinary services.

***Plan Activation***

Activate the contingency plan as soon as the disaster occurs or when an imminent threat is identified. This includes notifying the designated Incident Commander and key team members, as well as initiating the communication channels outlined in the plan. Ensure that all relevant team members are aware of the plan activation procedures and understand their roles and responsibilities.

***Communication and Coordination***

Establish effective communication channels with internal and external stakeholders, including veterinary professionals, relevant authorities, and partner organizations. Ensure clear lines of communication to facilitate information sharing, resource coordination, and collaborative decision-making.

***Resource Mobilization***

Assess the available resources, including personnel, equipment, and supplies, and mobilize them according to the needs identified in the contingency plan. Coordinate with local and regional veterinary facilities and organizations to share resources and support each other during the response.

***Triage and Treatment***

Implement the established triage and treatment protocols to prioritize and provide appropriate care to affected animals. Allocate resources based on the severity of injuries or illnesses, ensuring that critical cases receive immediate attention.

### ***Incident Command System (ICS)***

Activate the ICS structure outlined in the contingency plan to establish clear command, control, and coordination of the response efforts. Assign roles and responsibilities to team members, including Incident Commander, Operations Chief, Logistics Chief, and other necessary positions, based on the ICS framework.

### ***Continual Assessment and Adaptation***

Regularly assess the evolving situation and adjust the response strategies as needed. Monitor the effectiveness of the implemented contingency plan, identify any gaps or challenges, and make necessary adjustments to ensure an efficient and effective response.

### ***Support and Care for Veterinary Personnel***

Provide necessary support and care for veterinary personnel involved in the response. This includes managing their well-being, ensuring adequate rest and nutrition, and addressing any physical or emotional needs they may have. Rotate staff if necessary to prevent exhaustion and maintain the quality of care provided.

### ***Documentation and Reporting***

Maintain accurate and detailed documentation of all response activities, including medical treatments, resources used, and communication exchanges. Capture lessons learned, challenges faced, and successful strategies for future reference and improvement of the contingency plan.

### ***Post-Disaster Recovery***

Transition from response to recovery by actively participating in post-disaster assessments and veterinary services dismantled. Collaborate with relevant authorities, organizations, and communities to support the recovery efforts for affected animals and the overall restoration of local veterinary services.

### ***Continuous Improvement***

Conduct a comprehensive evaluation of the response efforts following the disaster. Analyze the strengths and weaknesses of the implemented contingency plan and identify areas for improvement. Incorporate lessons learned into future revisions of the plan to enhance its effectiveness and adaptability.

### **Mitigation, Preparedness, Response, and Recovery Phases**

The four phases of disaster management, Mitigation, Preparedness, Response, and Recovery are used to delegate each stage of disaster. This guide provides a comprehensive framework for veterinary professionals to execute these phases, ensuring a coordinated and efficient approach to disaster management.

### ***Mitigation Phase***

The success of the subsequent phases relies on a strong foundation created in the mitigation phase. The following is a guideline to ensure when implementing contingency plans during the mitigation phase that all aspects of this phase are considered. I have broken up this phase into risk identification, education and awareness, environmental

management, early warning systems, collaborative partnerships, training and capacity building, documentation and reporting, and continuous monitoring.

### **Risk Identification**

Identify potential hazards and risks specific to the disaster scenario that may impact animal health and welfare. Consider factors such as structural damage, environmental hazards, disease outbreaks, and resource limitations. Conduct thorough assessments to determine the severity and likelihood of each identified risk. Develop and implement preventive measures to minimize the impact of hazards on human and animal populations. This may include securing animal shelters or hospital locations, implementing biosecurity protocols, and establishing evacuation plans for at-risk areas. Collaborate with local authorities and animal welfare organizations to ensure a coordinated and comprehensive approach to mitigation.

### **Education and Awareness**

Conduct educational campaigns and outreach initiatives to raise awareness among the public, animal owners, and relevant stakeholders about disaster preparedness and mitigation strategies. Provide guidance on proper injured animal handling, evacuation procedures, and the importance of early intervention to mitigate risks.

**Environmental Management**

Implement measures to manage and mitigate environmental risks that may arise during a disaster. This includes addressing issues such as water contamination, air quality, and hazardous waste management. Collaborate with environmental agencies and experts to ensure the safe handling and disposal of hazardous materials and to mitigate any negative environmental impacts.

**Early Warning Systems**

Establish early warning systems to detect and monitor potential threats to animal health and welfare. Utilize technology, such as monitoring devices, weather alerts, and communication systems, to receive timely information on impending disasters. Ensure that the veterinary emergency team is well-equipped to interpret and respond to early warning signals effectively.

**Collaborative Partnerships**

Forge partnerships and collaborations with local, regional, and national stakeholders involved in disaster management, including government agencies, non-profit organizations, and community groups. Foster a multidisciplinary approach to mitigation efforts, leveraging the expertise, resources, and support of diverse stakeholders.

### **Training and Capacity Building**

Provide ongoing training and capacity-building programs for the veterinary emergency team to enhance their knowledge and skills in disaster mitigation. This includes training on risk assessment, hazard identification, emergency response protocols, and the use of specialized equipment and technologies. Regularly conduct drills and simulations to ensure readiness and proficiency in executing mitigation strategies.

### **Documentation and Reporting**

Maintain comprehensive documentation of mitigation activities, including risk assessments, preventive measures, training programs, and collaborative efforts. Keep detailed records of actions taken and outcomes achieved. This documentation will facilitate post-disaster analysis, enable accountability, and support future mitigation planning and decision-making.

### **Continuous Monitoring and Evaluation**

Continuously monitor and evaluate the effectiveness of mitigation efforts during and after a disaster. Collect data, gather feedback, and conduct assessments to identify areas for improvement and refine mitigation strategies. Document lessons learned to share the best practices within the veterinary community to enhance future mitigation efforts.

## ***Preparedness Phase***

The preparedness phase is a critical component of effective disaster management. By diligently preparing in advance, veterinary professionals can enhance their response capabilities and minimize the impact on animal health and welfare. This guide provides a framework for executing the preparedness phase including Emergency Planning, Resource Management, Training, Information Management, and Stakeholders

### **Emergency Planning**

Develop a detailed emergency response plan that outlines roles, responsibilities, and procedures for the veterinary emergency team. Ensure the plan aligns with established protocols and incorporates lessons learned from previous disasters.

Identify and assess potential risks and hazards specific to your region, considering natural disasters, disease outbreaks, and other potential emergencies.

### **Resource Management**

Conduct a thorough inventory of necessary resources, including medical supplies, equipment, and personnel. Identify potential gaps and develop strategies for acquiring and maintaining these resources during a disaster. Establish relationships and agreements with external organizations, such as veterinary clinics, animal welfare agencies, and emergency management authorities, to ensure access to additional resources if needed. Develop a system for resource tracking and replenishment to ensure readiness for future incidents.

## **Training**

Provide regular training sessions for veterinary personnel to enhance their knowledge and skills in disaster response. Focus on topics such as triage, emergency medical care, animal handling, and incident management. Conduct drills and simulations to test the effectiveness of the emergency response plan. Practice different disaster scenarios to improve coordination, decision-making, and communication among team members. Encourage participation in external training opportunities and workshops offered by disaster response organizations, veterinary associations, and public health agencies.

## **Information Management**

Establish communication protocols and channels to ensure seamless information flow within the veterinary emergency team and with external stakeholders.

Maintain up-to-date contact information for team members, partner organizations, and relevant authorities. Designate primary and alternate communication methods in case of network disruptions. Develop a system for collecting and disseminating critical information, including situational updates, animal tracking, and resource availability, to facilitate effective decision-making and response coordination.

Stakeholders: Engage with key stakeholders, such as local veterinary professionals, disaster management authorities, public health agencies, and community organizations. Foster collaboration to leverage expertise, resources, and support during a disaster. Participate in community preparedness initiatives and engage in joint training exercises with other response agencies to promote a

coordinated approach. Establish and maintain relationships with local media outlets to facilitate timely and accurate dissemination of public information during a disaster.

### ***Response Phase***

During the response phase, prompt and efficient action is essential to provide immediate assistance to affected animals and communities. This guide outlines key steps and considerations for executing the response phase, ensuring effective coordination and swift response during a veterinary emergency. This phase should include activation and mobilization, assessment and triage, emergency medical care, animal evacuation and sheltering, and communication.

#### **Activation and Mobilization**

Activate the veterinary emergency team in accordance with the established emergency response plan. Designate an Incident Commander and ensure clear communication channels for rapid mobilization. Conduct a roll call to confirm the availability and readiness of team members. Verify that necessary resources, equipment, and supplies are accessible and in working condition. Coordinate with relevant authorities and agencies to integrate the veterinary response efforts with overall disaster response operations.

### **Assessment and Triage**

Conduct rapid assessments of affected areas to evaluate the extent of damage and identify priority areas for animal assistance. Assess the needs of both domestic and wildlife populations. Implement a triage system to categorize animals based on their medical condition and urgency of treatment. Prioritize critical cases and allocate resources accordingly. Ensure the safety of the veterinary team by assessing and addressing any potential hazards or risks in the response area.

Emergency Medical Care: Provide immediate medical care and treatment to injured or sick animals. Administer first aid, stabilize critical patients, and address urgent medical needs. Establish temporary veterinary treatment facilities to handle a large influx of animals. Ensure these facilities have the necessary equipment, supplies, and personnel to provide adequate care. Implement infection control measures to prevent the spread of diseases and ensure biosecurity within the response area.

### **Animal Evacuation and Sheltering**

Develop and implement plans for animal evacuation and temporary sheltering. Coordinate with local animal welfare organizations, veterinary clinics, and other facilities to provide suitable accommodations for displaced animals. Ensure proper identification, documentation, and tracking of evacuated animals to facilitate reunification with their owners or appropriate long-term care. Address the specific needs of different animal species, including companion animals, livestock, and wildlife, during the evacuation and sheltering process.

## **Communication**

Maintain effective communication within the veterinary emergency team and with external stakeholders. Regularly update team members on the status of operations, resource needs, and emerging challenges. Collaborate with local authorities, public health agencies, and community organizations to align response efforts and maximize available resources. Provide accurate and timely public information regarding animal welfare and available veterinary services to help alleviate concerns and facilitate community engagement.

## ***Recovery Phase***

After the immediate response efforts, it is essential to shift focus towards long-term recovery and rebuilding. This guide outlines key steps and considerations for executing the recovery phase which includes damage assessment, emotional support, and continuous improvement.

## **Damage Assessment**

Conduct a comprehensive assessment of the extent of damage to animal facilities, infrastructure, and resources. Document the losses and identify areas that require rehabilitation or reconstruction. Prioritize the rehabilitation of veterinary clinics, and other veterinary infrastructure to resume essential services. Repair or replace damaged equipment, supplies, and medications as necessary.

## **Emotional Support**

To provide emotional support for veterinary professionals participating in disaster relief, it is essential to establish a supportive and empathetic environment.

Encourage open and confidential discussions among team members, allowing them to share their experiences, emotions, and coping strategies. Offer access to mental health resources, such as counseling services or support groups, where veterinary professionals can seek assistance and guidance in processing their experiences and emotions. Implement Critical Incident Stress Management (CISM) programs to address acute stress reactions and foster emotional resilience.

Recognize and validate the emotions of veterinary professionals, acknowledging the emotional toll that disaster response can have on them. Provide scheduled rest and recuperation periods during extended disaster missions to allow time for emotional recharge and self-care. Continue to offer emotional support and counseling after the disaster response and collaborate with Employee Assistance Programs (EAPs) to provide additional resources and support for veterinary professionals' emotional well-being. Organize resilience-building activities that promote team bonding and self-care. By prioritizing emotional support, veterinary professionals can better cope with the challenges of disaster relief and maintain their well-being throughout the entire process.

### **Continuous Improvement**

Maintain accurate records of the disaster response and recovery activities, including the number of animals treated, veterinary procedures performed, and resources utilized. Collect data on the effectiveness of response strategies and identify areas for improvement in future emergency operations. Conduct post-disaster evaluations in collaboration with relevant stakeholders to assess the effectiveness and efficiency of the recovery phase. Identify gaps, challenges, and successes encountered during the recovery process and develop strategies for continuous improvement. Foster ongoing communication and collaboration among veterinary professionals, disaster management authorities, and community stakeholders to strengthen future response and recovery efforts.

Veterinary emergency teams can effectively execute the mitigation, preparedness, response, and recovery phases during a disaster. The successful implementation of these phases requires a proactive and coordinated approach, emphasizing risk mitigation, preparedness planning, swift response actions, and focused recovery efforts.

### **Post Evaluation for Future Adaptation**

Each section of this guideline has emphasized the importance of evaluating the effectiveness of every implementation within the disaster management framework. When looking for post evaluations and assessing the importance of future adaptations the following should be considered a post response evaluation, training, and ongoing monitoring.

### ***Post-Response Evaluation***

Gather feedback from team members, stakeholders, and partners involved in the disaster response. Conduct interviews, surveys, and focus groups to collect their perspectives and insights on the effectiveness of the team's actions. Analyze response data, including response times, resource utilization, and outcomes, to identify strengths, weaknesses, and areas for improvement. Evaluate communication channels and protocols to assess their effectiveness in facilitating coordination, information sharing, and decision-making during the response. Review and revise standard operating procedures (SOPs) based on identified gaps or shortcomings. Ensure that SOPs are up to date, align with best practices, and reflect the team's evolving needs. Enhance coordination and collaboration with other response agencies, stakeholders, and partners to foster better integration and effectiveness in future joint operations.

### ***Training***

Identify specific training needs and develop a comprehensive training program for team members. This may include specialized disaster response training, technical skill development, or communication and leadership training. Establish regular training exercises and simulations to practice response procedures, test coordination mechanisms, and assess the team's readiness for future emergencies. Provide opportunities for professional development and continuing education for team members to stay updated on the latest advancements in veterinary emergency management.

### ***Ongoing Monitoring***

Implement mechanisms for continuous monitoring and evaluation of the team's preparedness and response capabilities. Regularly assess the team's performance through drills, exercises, and tabletop simulations. Maintain an open feedback loop with team members, stakeholders, and partners to encourage ongoing communication and improvement. Regularly review and update the team's disaster response plans, incorporating new knowledge, technologies, and lessons learned from recent responses.

By conducting thorough evaluations, documenting lessons learned, implementing necessary adaptations, and investing in training and development, the team can continuously improve their preparedness and effectiveness in future emergency responses. Ongoing monitoring and evaluation, along with a commitment to open communication and collaboration, ensure that the team remains adaptable and responsive to the evolving challenges of veterinary emergency management.

The results of this thesis have provided valuable insights and guidelines to establish a structured disaster management plan for the emergency veterinary community. By addressing key categories such as defining scope and objectives, conducting risk assessments, reviewing existing guidelines, engaging stakeholders, developing a disaster management framework, implementing contingency plans, and conducting post-evaluations for future adaptation, veterinary professionals can significantly enhance their disaster response capabilities.

## **CHAPTER 5: Conclusions**

The purpose of this study was to develop a disaster guideline contingency plan for the Veterinary Emergency Group travel team, focusing on comprehensive disaster management in veterinary services. Throughout the research process, several key findings were identified, which contribute to the theoretical understanding of the topic and provide insights for future research and practical applications. However, it is essential to acknowledge the limitations of the study and recognize the need for further investigation to refine the theoretical framework.

### **Discussion**

The findings of this study significantly contribute to the theoretical understanding of disaster management in the context of veterinary services. By formulating a comprehensive disaster guideline contingency plan for the Veterinary Emergency Group travel team, integrating The One Health model, the World Organization for Animal Health (OIE) framework guidelines, and the Incident Command System (ICS), this research significantly adds to the knowledge base concerning effective disaster response in veterinary services.

The development of the contingency plan serves as a tangible demonstration of the practical application and effectiveness of integrating multiple theoretical frameworks into a cohesive approach. The One Health model, as defined by the World Health Organization (WHO), recognizes the interconnectedness of human, animal, and environmental health, emphasizing the importance of collaboration between multiple sectors to achieve optimal health outcomes (WHO, 2015). In parallel, the OIE's

framework guidelines facilitate the establishment of veterinary health standards and promote international cooperation to combat animal diseases (OIE, 2017). Furthermore, the Incident Command System, as described by the Federal Emergency Management Agency (FEMA), is a standardized approach that enables effective coordination, communication, and response during emergencies (FEMA, 2020).

The integration of The One Health model, the OIE guidelines, and the ICS into the contingency plan reveals their potential to bolster the preparedness, response, and recovery capabilities of veterinary emergency teams during disasters. By aligning with these well-established models, the contingency plan ensures a holistic and interdisciplinary approach in disaster management, acknowledging the intertwined welfare of both human and animal health.

Moreover, the contingency plan serves as a practical blueprint for veterinary emergency teams to efficiently communicate, coordinate, and respond during disasters. It underscores the significance of clear and efficient internal communication systems, which, according to The One Health model, fosters cooperation among human and animal health professionals, environmentalists, and other relevant stakeholders (WHO, 2015).

The thesis highlights the essential role of policy development and implementation in veterinary disaster management. The findings emphasize the necessity for policies that embrace the principles and objectives of The One Health model, the OIE guidelines, and the ICS, ensuring seamless integration into veterinary emergency practices. Policymakers and stakeholders can utilize this information to design and implement policies that

prioritize comprehensive disaster management in veterinary services, considering the broader perspective of public health and animal welfare.

This study's comprehensive disaster guideline contingency plan, founded on The One Health model, the OIE framework guidelines, and the ICS, not only enriches theoretical understanding but also offers a practical framework to optimize disaster response in veterinary services. By incorporating the perspectives and strategies of these renowned models, the contingency plan exemplifies a cohesive and interdisciplinary approach that paves the way for enhanced preparedness, communication, and cooperation among veterinary professionals, stakeholders, and public health authorities during times of crisis.

#### **Limitations to the current study**

The project focuses on the Veterinary Emergency Group travel team and may not address the specific needs and challenges of other veterinary organizations or individual practitioners. While the developed disaster guideline contingency plan provides valuable insights and recommendations, it is important to recognize that different veterinary organizations may have unique requirements and operational constraints. Therefore, future research should aim to explore and adapt the contingency plan to cater to a broader range of veterinary emergency teams, considering their specific contexts and capabilities.

The project's scope is limited to the United States, and the findings and recommendations may not be directly applicable to other countries or regions. Each country or region has its own unique infrastructure, regulatory frameworks, and disaster management systems in place. These factors can significantly influence the implementation and effectiveness of a contingency plan. Therefore, future research should consider conducting cross-

national or cross-regional studies to account for the diverse contexts and adapt the guidelines accordingly to ensure their relevance and applicability worldwide.

The availability and accessibility of resources, such as funding, equipment, and personnel, may vary among different locations and organizations, which could impact the implementation of the disaster guideline contingency plan. While the developed plan provides a comprehensive framework, it is essential to acknowledge that not all veterinary organizations may have equal access to resources required for effective disaster management. Future research should address resource disparities and explore strategies to overcome these challenges, such as seeking partnerships, securing funding, or developing alternative approaches that are adaptable to different resource capacities.

By recognizing these limitations and taking them into account, future research can strive to develop more inclusive and context-specific disaster guideline contingency plans that encompass a broader range of veterinary emergency teams and address resource disparities among different locations.

### **Directions of future research**

There are several promising avenues for future research in the field of veterinary emergency management. Firstly, conducting empirical studies to validate and refine the developed contingency plan in real disaster situations would provide valuable insights into its effectiveness and practicality. Additionally, exploring the integration of emerging technologies, such as telemedicine and data analytics, into veterinary disaster management could enhance communication, decision-making, and resource allocation during emergencies. Furthermore, investigating the psychological and emotional well-

being of veterinary professionals involved in disaster response and recovery can contribute to developing support systems and strategies to mitigate the potential negative impacts of such high-stress environments. Lastly, comparative studies across different regions and contexts can shed light on the effectiveness of various disaster management approaches and facilitate the sharing of best practices.

In conclusion, this study has made significant strides in advancing theoretical understanding and practical applications of disaster management in the veterinary emergency context. The developed disaster guideline contingency plan for the Veterinary Emergency Group travel team serves as a valuable tool for enhancing preparedness, response, and recovery efforts. However, it is crucial to recognize the limitations of the study, including its focus on a specific veterinary organization, limited geographical scope, and potential resource variations among different locations and organizations. Future research should expand on these findings, refine the theoretical framework, adapt the guidelines to diverse veterinary organizations, explore cross-national or cross-regional applications, and address resource disparities. By addressing these areas, we can further improve the effectiveness and applicability of disaster management contingency plans.

## **Appendix A**

### **The Manhattan Principles on “One World, One Health”**

1. Recognize the essential link between human, domestic animal and wildlife health and the threat disease poses to people, their food supplies and economies, and the biodiversity essential to maintaining the healthy environments and functioning ecosystems we all require.
2. Recognize that decisions regarding land and water use have real implications for health. Alterations in the resilience of ecosystems and shifts in patterns of disease emergence and spread manifest themselves when we fail to recognize this relationship.
3. Include wildlife health science as an essential component of global disease prevention, surveillance, monitoring, control and mitigation.
4. Recognize that human health programs can greatly contribute to conservation efforts.
5. Devise adaptive, holistic and forward-looking approaches to the prevention, surveillance, monitoring, control and mitigation of emerging and resurging diseases that take the complex interconnections among species into full account.
6. Seek opportunities to fully integrate biodiversity conservation perspectives and human needs (including those related to domestic animal health) when developing solutions to

infectious disease threats.

7. Reduce the demand for and better regulate the international live wildlife and bushmeat trade not only to protect wildlife populations but to lessen the risks of disease movement, cross-species transmission, and the development of novel pathogen-host relationships.

The costs of this worldwide trade in terms of impacts on public health, agriculture and conservation are enormous, and the global community must address this trade as the real threat it is to global socioeconomic security.

8. Restrict the mass culling of free-ranging wildlife species for disease control to situations —where there is a multidisciplinary, international scientific consensus that a wildlife population poses an urgent, significant threat to human health, food security, or wildlife health more broadly.

9. Increase investment in the global human and animal health infrastructure commensurate with the serious nature of emerging and resurging disease threats to people, domestic animals and wildlife. Enhanced capacity for global human and animal health surveillance and for clear, timely information-sharing (that takes language barriers into account) can only help improve coordination of responses among governmental and nongovernmental agencies, public and animal health institutions, vaccine / pharmaceutical manufacturers, and other stakeholders.

10. Form collaborative relationships among governments, local people, and the private

and public (i.e.- non-profit) sectors to meet the challenges of global health and biodiversity conservation.

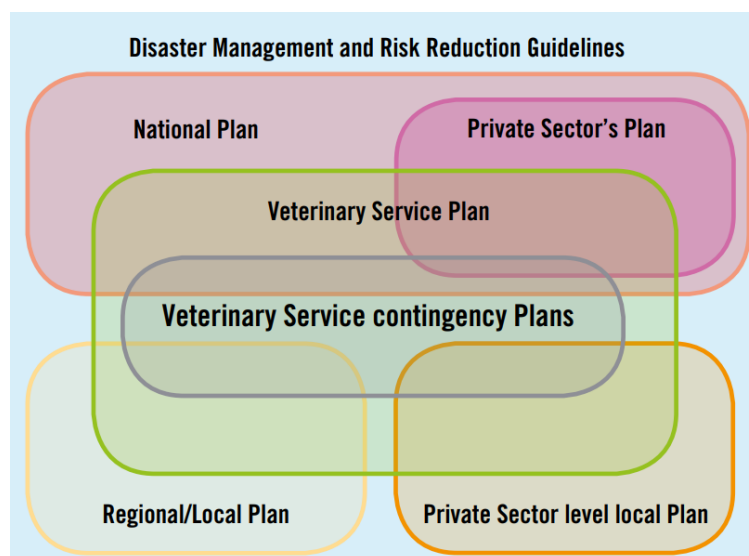
11. Provide adequate resources and support for global wildlife health surveillance networks that exchange disease information with the public health and agricultural animal health communities as part of early warning systems for the emergence and resurgence of disease threats.

12. Invest in educating and raising awareness among the world's people and in influencing the policy process to increase recognition that we must better understand the relationships between health and ecosystem integrity to succeed in improving prospects for a healthier planet.

(Cook et al., 2004)

## Appendix B

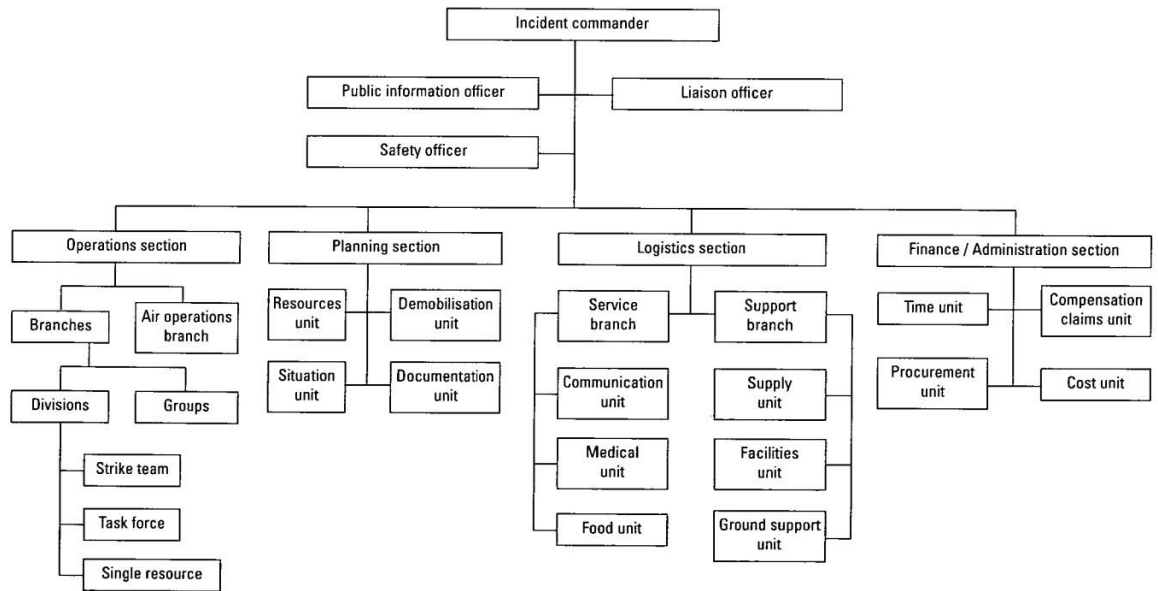
### The World Organization for Animal Health Disaster Management and Risk Reduction Guidelines



(OIE, 2016).

## Appendix C

### Incident Command System Outline



(Madigan & Dacre, 2009).

## Appendix D

### risk assessment matrix

<b>LIKELIHOOD</b> (probability) How likely is the event to occur at some time in the (Linear Scale time specific matrix)	<b>CONSEQUENCES</b>				
	<b>What is the Severity of injuries /potential damages / financial impacts (if the risk event actually occurs)? (Logarithmic Scale, property industry specific matrix)</b>				
	Insignificant	Minor	Moderate	Major	Catastrophic
	No Injuries First Aid No Envir Damage << \$1,000 Damage	Some First Aid required Low Envir Damage << \$10,000 Damage	External Medical Medium Envir Damage <<\$100,000 Damage	Extensive injuries High Envir Damage <<\$1,000,000 Damage	Death or Major Injuries Toxic Envir Damage >>\$1,000,000 Damage
Almost certain -	<b>MODERATE</b>	<b>HIGH</b>	<b>HIGH</b>	<b>CRITICAL</b>	<b>CRITICAL</b>
expected in normal circumstances (100%)	<b>RISK</b>	<b>RISK</b>	<b>RISK</b>	<b>RISK</b>	<b>RISK</b>
Likely -	<b>MODERATE</b>	<b>MODERATE</b>	<b>HIGH</b>	<b>HIGH</b>	<b>CRITICAL</b>
probably occur in most circumstances (10%)	<b>RISK</b>	<b>RISK</b>	<b>RISK</b>	<b>RISK</b>	<b>RISK</b>
Possible -	<b>LOW</b>	<b>MODERATE</b>	<b>HIGH</b>	<b>HIGH</b>	<b>CRITICAL</b>
might occur at some time. (1%)	<b>RISK</b>	<b>RISK</b>	<b>RISK</b>	<b>RISK</b>	<b>RISK</b>
Unlikely -	<b>LOW</b>	<b>MODERATE</b>	<b>MODERATE</b>	<b>HIGH</b>	<b>HIGH</b>
could occur at some future time (0.1%)	<b>RISK</b>	<b>RISK</b>	<b>RISK</b>	<b>RISK</b>	<b>RISK</b>
Rare -	<b>LOW</b>	<b>LOW</b>	<b>MODERATE</b>	<b>MODERATE</b>	<b>HIGH</b>
Only in exceptional circumstances 0.01%)	<b>RISK</b>	<b>RISK</b>	<b>RISK</b>	<b>RISK</b>	<b>RISK</b>

(Manager, 2023)

## Appendix E

### A Comprehensive List of Stakeholders for A Veterinary Disaster

#### Contingency Plan:

##### **Veterinary Professionals**

Veterinarians, veterinary technicians, and other veterinary staff involved in providing animal care during disasters. This should include a full roster of all staff members participating. Please continue the list with the names, positions, and contact information of all the veterinary professionals involved in your team. Make sure to include relevant details such as their roles, specializations, and any specific training or certifications they possess.

##### 1. Example Roster

Name: [Full Name]

Position: [Veterinarian/Veterinary Technician/Other]

Contact Information: [Phone Number/Email]

##### **Veterinary Associations and Organizations**

National and international associations representing veterinary professionals and promoting animal health and welfare.

##### *National Associations (United States)*

##### 1. American Veterinary Medical Association (AVMA)

Website: [www.avma.org](http://www.avma.org)

2. American Animal Hospital Association (AAHA)

Website: [www.aaha.org](http://www.aaha.org)

### ***International Associations***

1. World Veterinary Association (WVA)

Website: [www.worldvet.org](http://www.worldvet.org)

2. Federation of Veterinarians of Europe (FVE)

Website: [www.fve.org](http://www.fve.org)

3. Canadian Veterinary Medical Association (CVMA)

Website: [www.canadianveterinarians.net](http://www.canadianveterinarians.net)

4. Australian Veterinary Association (AVA)

Website: [www.ava.com.au](http://www.ava.com.au)

5. British Veterinary Association (BVA)

Website: [www.bva.co.uk](http://www.bva.co.uk)

6. New Zealand Veterinary Association (NZVA)

Website: [www.nzva.org.nz](http://www.nzva.org.nz)

7. World Vets

Website: [worldvets.org/](http://worldvets.org/)

## **Government Agencies**

Local, state, and national government agencies responsible for disaster management, public health, and animal welfare.

### ***Local***

1. Local Emergency Management Agency

Website: [www.localagency.gov](http://www.localagency.gov)

2. City/County Department of Public Health

Website: [www.cityhealthdept.gov](http://www.cityhealthdept.gov)

### ***State***

1. State Emergency Management Agency

Website: [www.stateagency.gov](http://www.stateagency.gov)

2. State Department of Agriculture

Website: [www.stateagriculturedept.gov](http://www.stateagriculturedept.gov)

### ***National***

1. Federal Emergency Management Agency (FEMA)

Website: [www.fema.gov](http://www.fema.gov)

2. Centers for Disease Control and Prevention (CDC)

Website: [www.cdc.gov](http://www.cdc.gov)

3. United States Department of Agriculture (USDA)

Website: [www.usda.gov](http://www.usda.gov)

### **Emergency Management Authorities**

Agencies overseeing disaster response and coordinating efforts with various stakeholders.

1. Federal Emergency Management Agency (FEMA)

Website: [www.fema.gov](http://www.fema.gov)

2. State Emergency Management Agency

Website: [www.stateema.gov](http://www.stateema.gov)

3. County Emergency Management Agency

Website: [www.countyema.gov](http://www.countyema.gov)

4. City Emergency Management Agency

Website: [www.cityema.gov](http://www.cityema.gov)

### **Public Health Agencies**

Organizations focused on protecting and promoting public health, including zoonotic disease control and prevention.

1. Centers for Disease Control and Prevention (CDC)

Website: [www.cdc.gov](http://www.cdc.gov)

2. World Health Organization (WHO)

Website: [www.who.int](http://www.who.int)

3. State Department of Health

Website: [www.statehealth.gov](http://www.statehealth.gov)

4. County Department of Health

Website: [www.countyhealth.gov](http://www.countyhealth.gov)

5. The Administration of Strategic Preparedness and Response (ASPR)

Website: [www.aspr.hhs.gov](http://www.aspr.hhs.gov)

### **Animal Control Agencies**

Agencies that are responsible for handling and managing animals during emergencies.

1. National Animal Control Association (NACA)

Website: [www.nacenet.org](http://www.nacenet.org)

2. American Society for the Prevention of Cruelty to Animals (ASPCA)

Website: [www.aspca.org](http://www.aspca.org)

3. State Department of Animal Control

Website: [www.stateanimalcontrol.gov](http://www.stateanimalcontrol.gov)

4. County Department of Animal Control

Website: [www.countyanimalcontrol.gov](http://www.countyanimalcontrol.gov)

### **Animal Welfare Organizations**

Non-profit organizations dedicated to animal welfare, rescue, and rehabilitation.

1. American Society for the Prevention of Cruelty to Animals (ASPCA)

Website: [www.aspca.org](http://www.aspca.org)

2. Humane Society of the United States (HSUS)

Website: [www.humanesociety.org](http://www.humanesociety.org)

3. World Animal Protection

Website: [www.worldanimalprotection.org](http://www.worldanimalprotection.org)

4. Best Friends Animal Society

Website: [www.bestfriends.org](http://www.bestfriends.org)

5. International Fund for Animal Welfare (IFAW)

Website: [www.ifaw.org](http://www.ifaw.org)

6. Local Animal Rescue Organization (LARO)

Website: [www.larorescue.org](http://www.larorescue.org)

7. National Alliance of State Animal and Agricultural Emergency Programs  
(NASAAEP)

Website: [www.thenasaaep.com](http://www.thenasaaep.com)

## **Animal Shelter and Rescue Organizations**

Organizations providing temporary housing, care, and support for animals during disasters.

1. American Society for the Prevention of Cruelty to Animals (ASPCA)

Website: [www.aspca.org](http://www.aspca.org)

2. Humane Society of the United States (HSUS)

Website: [www.humanesociety.org](http://www.humanesociety.org)

3. World Animal Protection

Website: [www.worldanimalprotection.org](http://www.worldanimalprotection.org)

4. Best Friends Animal Society

Website: [www.bestfriends.org](http://www.bestfriends.org)

5. International Fund for Animal Welfare (IFAW)

Website: [www.ifaw.org](http://www.ifaw.org)

6. Local Animal Rescue Organization (LARO)

Website: [www.larorescue.org](http://www.larorescue.org)

## **Agricultural Agencies**

Agencies involved in the management and protection of livestock and farm animals during disasters.

1. United States Department of Agriculture (USDA)

Website: [www.usda.gov](http://www.usda.gov)

2. Animal and Plant Health Inspection Service (APHIS)

Website: [www.aphis.usda.gov](http://www.aphis.usda.gov)

3. National Agricultural Library (NAL)

Website: [www.nal.usda.gov](http://www.nal.usda.gov)

4. State Department of Agriculture (e.g., California Department of Food and Agriculture)

Website: [www.agriculture.state.us](http://www.agriculture.state.us)

5. County Agricultural Extension Office

Website: [www.extension.org](http://www.extension.org)

## **Public Safety and Law Enforcement**

Agencies ensuring public safety and enforcing laws and regulations during emergencies.

1. Federal Emergency Management Agency (FEMA)

Website: [www.fema.gov](http://www.fema.gov)

2. Department of Homeland Security (DHS)

Website: [www.dhs.gov](http://www.dhs.gov)

3. State Emergency Management Agency (e.g., California Emergency Management Agency)

Website: [www.emergencymanagementagency.state.us](http://www.emergencymanagementagency.state.us)

## **Community Organizations**

Local community groups, including neighborhood associations, faith-based organizations, and volunteer groups.

1. National Council of Nonprofit Organizations

Website: <http://www.councilofnonprofits.org>

## **Educational Institutions**

Universities and colleges with veterinary programs and research facilities have disaster management programs.

1. Ross University School of Veterinary Medicine Disaster Research Working Group

Website: [http://www.lsu.edu/vetmed/disaster\\_prep/index.php](http://www.lsu.edu/vetmed/disaster_prep/index.php)

Email: [cgallagher@rossvet.edu.kn](mailto:cgallagher@rossvet.edu.kn)

2. Louisiana State University School of Veterinary Medicine Disaster Preparedness  
And Response

Website: <http://www.councilofnonprofits.org>

### **Media and Communication Agencies**

News outlets, social media platforms, and communication agencies responsible for disseminating information during disasters.

1. CNN

Website: [www.cnn.com](http://www.cnn.com)

2. BBC

Website: [www.bbc.co.uk](http://www.bbc.co.uk)

3. The New York Times

Website: [www.nytimes.com](http://www.nytimes.com)

### ***Local examples such as Tennessee***

1. Tennessee Emergency Management Agency (TEMA)

Website: [www.tn.gov/tema](http://www.tn.gov/tema)

2. WKRN News 2

Website: [www.wkrn.com](http://www.wkrn.com)

3. WSMV News 4

Website: [www.wsmv.com](http://www.wsmv.com)

4. NewsChannel 5

Website: [www.newschannel5.com](http://www.newschannel5.com)

5. The Tennessean

Website: [www.tennessean.com](http://www.tennessean.com)

6. WATE 6 News

Website: [www.wate.com](http://www.wate.com)

### **Animal Owners and Guardians**

Individuals responsible for the welfare and safety of their pets and livestock.

1. Red Rover: A volunteer organization that helps animals in crisis and provides temporary emergency shelter

Website: [redrover.org](http://redrover.org)

### ***Local Examples of Owners and Guardians***

1. Pet Owners:

John Smith

Contact Information: (615) 555-1234

Email: [johnsmith@email.com](mailto:johnsmith@email.com)

2. Livestock Owners:

Michael Davis

Contact Information: (423) 555-9876

Email: [mdavis@email.com](mailto:mdavis@email.com)

Please note that these are fictional names and contact details provided for illustrative purposes only. It's important to consider privacy and data protection laws when obtaining and sharing contact information for individuals.

### **Local Businesses**

#### ***Local Examples for Tennessee***

1. Business Name: Nashville Veterinary Specialists

Type of Business: Veterinary Clinic

Contact Information: (615) 386-0107

Address: 2971 Sidco Dr, Nashville, TN 37204

2. Business Name: PetSmart

Type of Business: Pet Store

Contact Information: (615) 383-4443

Address: 719 Thompson Ln, Nashville, TN 37204

3. Business Name: The Farm at Natchez Trace

Type of Business: Animal Supply Provider

Contact Information: (615) 662-6628

Address: 9479 Highway 96 W, Franklin, TN 37064

4. Business Name: West Bearden Veterinary Hospital

Type of Business: Veterinary Clinic

Contact Information: (865) 588-7387

Address: 8706 Unicorn Dr, Knoxville, TN 37923

5. Business Name: Pet Supermarket

Type of Business: Pet Store

Contact Information: (615) 777-2275

Address: 11136 Parkside Dr, Knoxville, TN 37934

Businesses in the veterinary and animal care sector, such as veterinary clinics, pet stores, and animal supply providers. Please continue the list with the names, types of businesses,

contact information, and addresses of all the veterinary and animal care businesses in your area.

It is important to note that the specific list of stakeholders may vary depending on the local context, the type of disaster, and the resources available. Engaging and collaborating with these stakeholders will ensure a coordinated and effective response to safeguard animal and public health during emergencies.

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