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## Examining the U.S. Disaster Management Program: A Case Study of the U.S. Virgin Islands Hurricanes Irma and Maria Evacuation

Victoria F. Vachon  
*Walden University*

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# Walden University

College of Health Sciences and Public Policy

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Victoria Vachon

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Review Committee

Dr. W. Sumner Davis, Committee Chairperson, Public Health Faculty

Dr. David Anderson, Committee Member, Public Health Faculty

Chief Academic Officer and Provost  
Sue Subocz, Ph.D.

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2023

Abstract

Examining the U.S. Disaster Management Program: A Case Study of the U.S. Virgin  
Islands Hurricanes Irma and Maria Evacuation

by

Victoria Vachon

MS, University of Phoenix, 2007

BS, Minot State University, 1994

Dissertation Submitted in Partial Fulfillment  
of the Requirements for the Degree of  
Doctor of Philosophy  
Public Health

Walden University

August 2023

## Abstract

Whether from natural or human causes, every global community is at risk for overwhelming, destabilizing incidents. Hurricanes Irma and Maria devastated the U.S. Virgin Islands in late August and early September 2017, necessitating the urgent evacuation of hemodialysis patients over 1000 miles to the U.S. mainland. Because the damage and response to the U.S. territory were unprecedented, the public health implications of the government's strategies on the evacuated population subset were unexplored. However, available information suggested that some evacuees sustained avoidable harm while in the protracted care and custody of the government. This qualitative case study, conceptually framed by Bronfenbrenner's socioecological systems, examined the federal disaster management program's sufficiency to abate or preclude foreseeable risks to the evacuees. Structured interviews and documented evacuee and responder experiences, compared with programmatic specifications, informed equity and efficacy determinations. Decades of research described enhanced vulnerability among individuals impacted by social determinants of health. Despite these known risks, this study revealed operational activities that negatively impacted some evacuees' health, safety, wellbeing, and community reentry capability. Redirecting policy level disaster management priorities to those at the highest risk for worse outcomes can expose person level procedural gaps. As such, programmatic enhancements can spur transformative holistic positive social change, promoting equity in disaster response.

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## Dedication

I dedicate this document to the displaced and disparaged individuals around the world, whether driven from their communities by natural or human-generated forces.

## Acknowledgments

I am profoundly grateful to the supportive Walden University staff, perhaps most notably my Committee Chair, Dr. W. Sumner Davis, Methodologist, Dr. David Anderson, and Dr. Morris Bidjerano.

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## Chapter 1: Introduction to the Study

Hurricanes Irma and Maria devastated the Caribbean islands of Puerto Rico (PR) and the U.S. Virgin Islands (USVI) in late August and early September of 2017. These storms were among the most damaging in U.S. history (Blake, 2018; Chowdhury et al., 2019; Cox et al., 2019; Federal Emergency Management Agency [FEMA], 2018a; Government Accountability Office [GAO], 2019b; Larson et al., 2020; National Academies of Sciences, Engineering, and Medicine [NASEM], 2020b; USVI Hurricane Recovery and Resilience Task Force, 2018). All critical infrastructures within the USVI were compromised, including the healthcare delivery system and disaster management capabilities (Larson et al., 2020; Pokkriyath et al., 2020; USVI Hurricane Recovery and Resilience Task Force, 2018). Self evacuation by island-bound survivors, many inhibited by social determinants of health (SDH) challenges, was not optional (U.S. Census Bureau, 2019a, 2021; Veenema et al., 2019). Consequently, the U.S. president signed federal disaster declarations for the USVI in September 2017 (FEMA, 2021a; Larson et al., 2020). Due to the incident's scope, scale, and abatement needs, each federal department's emergency response components were activated (FEMA Public Affairs, 2017). The USVI disaster's unprecedented circumstances presented an opportunity to examine the quality and sufficiency of policies and procedures that governed the federally coordinated disaster response operations as an indicator of programmatic capacity to preserve public health following natural disasters.

Inadequacies and lapses in federal disaster management policies and procedures, which informed response strategies, oversight, and quality, may continue to risk survivor

safety and equitable community recovery. Predicted increases in significant hydrological events, possibly driven by climate change, compel urgent identification and remediation of national disaster management gaps to avert adverse outcomes and improve the quality of public-private, whole community disaster response strategies (Cox et al., 2019; Kirschenbaum, 2019; Knutson et al., 2019, 2020; Pasch et al., 2019; Shultz et al., 2019; Stripling et al., 2018; Veenema et al., 2019; Virgin Island Territory Emergency Management Agency [VITEMA], 2016; Zomorodi, 2020). Because the design of FEMA policies did not intend to address the needs of the most vulnerable populations, understanding the impact on communities at high risk for adverse disaster outcomes can prompt disparity reduction initiatives (Zomorodi, 2020). Threats to the vulnerable USVI citizens' health, safety, and wellbeing may have been foreseeable yet unabated. To that end, major components of this research focused on the operationalized federal policies, procedures, and outcomes relevant to U.S. Virgin Islanders affected by Hurricanes Irma and Maria.

### **Background**

The health and safety of citizens are integral to government roles and responsibilities. Hurricanes Irma and Maria overwhelmed the capabilities of the USVI government, inhibiting the local ability to conduct damage reconnaissance, formulate disaster declaration requests, or lead initial impact response activities (Larson et al., 2020). Additionally, gaps in preimpact development and postimpact adherence to federal response policies and procedures may have been instrumental in unmet survivor needs and inhibited local community recovery. Although research into the 2017 hurricane

season is ongoing, the subsequent coronavirus global pandemic may have impacted publication. Nevertheless, the available literature suggested that lapses in the federally coordinated response were inconsistent with the government's public safety responsibilities and the intent of the Stafford Act to provide disaster relief and emergency assistance to overwhelmed local governments (Robert T. Stafford Disaster Relief and Emergency Assistance Act, 1988).

Published research supported a foundational understanding regarding the federal government's preparation to lead an informed, collaborative disaster response. Risk cognizance and impact-reductive factors, such as SDH, environmental threats, preventive strategies, and available resources, bolster disaster management program efficacy (Gillum, 2019; Lichtveld, 2018; Willis et al., 2018). Despite the known catastrophic impact on the Caribbean region and diminished local resilience stores, the USVI territory was not prominent in postimpact research. As such, valuable lessons learned, to inform disaster management policies and procedure revisions, may remain undetected.

Valid information from lessons learned is instrumental to ensure disaster management programs are maintained and reflect current population risks and policies. However, the national disaster policies and strategies may not reflect valid research findings, which indicate that climate-change-driven hydrological assaults have disproportionately impacted disabled and low income individuals (Veenema et al., 2019). Integrating informative population based data into disaster management policy revisions and procedure updates could have improved the quality of response operations in 2017. The household poverty rate in the USVI in 2017 was 8% higher than the U.S. average

(Veenema et al., 2019). Additionally, 30% of Virgin Islanders were without healthcare insurance, compared to 7% of Puerto Ricans and 12% of the United States mainland (Artiga et al., 2018; Veenema et al., 2019). According to Bonilla-Félix and Suárez-Rivera (2019), Hurricane Maria caused an approximate 45% higher mortality rate in low income communities, but this increased mortality risk determination was limited to PR. It is unclear if the authoritative programmatic specifications, in place during the Caribbean response, positioned joint operations appropriately to abate these nuanced challenges. These socioeconomic challenges made a compelling case that U.S. Virgin Islanders may have been prepositioned for reduced postimpact survival and resilience, as relevant data excluded the USVI.

Research and population based knowledge gaps, specific to the USVI, may provide examples and evidentiary support for Kirschenbaum's (2019) global disaster management research regarding information fusion and response disparities. Specifically, global prevention and impact mitigation programs may not prioritize disenfranchised populations. Similarly, Zomorodi (2020) found that the U.S. disaster management program did not target geographies and populations at the highest risk of poor disaster survival and recovery. As a result, relevant due diligence may have been unsourced and equity gaps unbridged. While Bonilla-Félix and Suárez-Rivera (2019) and Veenema et al. (2019) highlighted the value of metrics to inform strategies, Kirschenbaum (2019) further explained that data accuracy was essential. Preparedness based on noncurrent data was a recurrent shortfall in global disaster management programs (Kirschenbaum, 2019). Additionally, failures to proceduralize lessons learned from prior incidents, such as



nuanced challenges to nonstate territories, may have contributed to avertable adverse outcomes and protracted recovery. Research and representation vacuity relative to disaster risk management justify further study to understand causal factors for postimpact outcomes and inform national, local, and individual disaster policies, procedures, and strategies.

### **Problem Statement**

The federal government holds the sole jurisdictional authority to direct disaster response cooperation and collaboration across state and territorial boundaries. Despite the availability of informative due diligence, such as incident precedents, population studies, and threat assessment research, federal policies and procedures may have been inadequate to ensure the health, safety, and wellbeing of the most vulnerable hurricane survivors. In this study, I examined the potential for recurrent and compromised disaster responses as information suggested the government did not develop, maintain, and operationalize a comprehensive and equitable disaster management program. Indeed, an example of one of the most indicative programmatic lapses resulted in allegations of lost medical evacuees, moved over 1000 miles from their communities by the federal government (Austin, 2018; Vora et al., 2018). It was unclear if, when, or how evacuee recovery and return to their families and communities would occur. Because of ongoing natural disaster risks to the United States and its territories, there is a time sensitive need to remedy insufficiencies in the government's capabilities to lead interjurisdictional, public-private disasters (Blum & Paradise, 2018; Lichtveld, 2018; NASEM, 2020b; Navarro, 2018; Pokkriyath et al., 2020; Roman-Basora & Bland, 2020). The federal

disaster management program maintenance may have been insufficient to guide a unified, multijurisdictional response force, thereby compromising the safe and fair posthurricane outcomes for the most vulnerable U.S. Virgin Islanders.

### **Study Purpose**

This qualitative case study was designed to explore the sufficiency of the federal disaster management program to meet public health, safety, and equity goals and expectations by examining the Hurricanes Irma and Maria response operations relative to the USVI. Programmatic sufficiency to achieve the desired outcomes was discernible by sourcing the experiences of evacuated USVI dialysis patients. Because government obligations included preserving the lives of citizens in harm's way, there was a public expectation that the federal government would engage in impact abatement activities, considering the scale of devastation and overwhelmed local mitigation capacities (Honoré, 2020; Kirschenbaum, 2019; NASEM, 2020a). Indeed, the federal government launched and led the public-private, all-of-government disaster response, including medical evacuations, to facilitate local government, critical infrastructure, and community restabilization (FEMA Public Affairs, 2017; NASEM, 2020b; Quarshie & Leuschner, 2018).

However, the quality of the operations, guided by programmatic specifications, was unclear. The catastrophic events in the Caribbean resulted in the entire disaster management system test under stress, illustrating the federal program's sufficiencies, and shortfalls. This study resolved to augment public health research literature and inform public health disaster readiness policies and response stratagem. Leveraging the

outcomes and experiences of underrepresented and vulnerable populations impacted by major disasters, such as the USVI dialysis evacuees, can contextualize the potential consequences of misaligned government policies, highlighting the need for meticulous and continuous programmatic review.

### **Research Questions**

1. How did the national disaster management policies and procedures mitigate the impact of the 2017 Hurricanes Irma and Maria on the United States Virgin Island's vulnerable dialysis population?
2. What procedures ensured, or failed to ensure, evacuees were provided with dignified, individualized care and services to support equitable access to daily living necessities while in the custody of the federal government?
3. How did federal response procedures facilitate multiagency cohesion, promoting a safe extraction to reintegration continuum for evacuees?

### **Conceptual Framework**

Bronfenbrenner's (1979) socioecological model provided the conceptual structure for this research study. The model delineated societal segments as interrelational systems of interdependence, engagement, and influence as components of a whole (Bronfenbrenner, 1979; Coreil, 2010). Using Bronfenbrenner's model as a conceptual framework, a qualitative contextual lens of the 2017 whole community disaster response facilitated examinations of level-specific roles, responsibilities, and consequences on the SDH-compromised survivors. Therefore, Bronfenbrenner's three socioecological

constructs of concentric, yet encapsulated and nested structures, which collectively formed whole societies were particularly well suited for this research.

As described, the societal levels extended outward from microlevel households, through mesolevel community support systems, to the external macrolevel (Bronfenbrenner, 1979; Coreil, 2010; McLeroy et al., 1988). Forasmuch as the macrolevel USVI and U.S. federal governments had jurisdictional authority over, and responsibility for, microlevel individuals, the Chapter 2 literature review captured interactions between the two distinct systems facilitated through mesolevel connections. Coreil (2010) detailed a subsequent deconstruction of Bronfenbrenner's three tiered model into a five tiered system. Nevertheless, the original three systems of engagement were pronounced in postimpact publications regarding the Caribbean disaster response.

Segmented qualitative systems reviews to evaluate the alignment between policy and practice in the response strategies following Hurricanes Irma and Maria can augment similar issue specific, postimpact research. The ecological approach has historically contributed to the literature regarding public health implications of hurricane disaster management and is described further in the literature review chapter. One antecedent to this research was a post Caribbean hurricane response study, conducted by the NASEM (2020a). The government agency's study leveraged the ecological model's multi strata interrelations to investigate postimpact communications challenges, extracting valuable lessons learned. The ecological model is suitable for multisystem research as a conceptual framework, revealing programmatic counterproductivities in isolated ecological segments or multisystem interoperability.

The all-of-government, whole community response in 2017 included multiple directly and indirectly involved societal and functional systems. Therefore, a structured, multisystem approach was appropriate to explore the specified research questions, including a review of federal policies, procedures, and strategies performed by macrolevel and mesolevel responders. Although no two complex disasters are identical, a qualitative perspective can inform improvements in directive policies and guiding procedures. To that end, this study illustrated the federal disaster management program efficacy by sourcing the experiential impact on microlevel survivors.

### **Nature of the Study**

National policies align with government principles and goals. Disaster response procedures operationalize policy specifications. Therefore, outcomes reflect the comprehensiveness and quality of the guidance in the federal procedures, such as the National Response Framework (NRF), the Response Federal Interagency Operations Plan (FIOP), and responder competence to perform delegated tasks. However, it was not apparent that the operationalized strategies effectively leveraged ecological stakeholders and response partners, sufficient to abate avoidable adverse outcomes. Case study methods were well suited to this research project because the USVI response operations were limited by time, geographic location, and impacted population (Creswell & Creswell, 2018; Harrison et al., 2017). Moreover, case study methods, influenced by a transformative paradigm, were suitable for understanding the impact of the disaster management operations on the dialysis evacuees as a representative vulnerable population sample (Creswell & Creswell, 2018; Harrison et al., 2017).

Accounts from experiencers and other knowledgeable sources increased the spectrum of descriptive content, bolstering data validity methods and research conclusions. Responders, evacuees, and family members provided valuable primary information regarding care in custody, transitions, and accommodation of daily needs experiences. Additionally, published reports, statements, and testimonies presented secondary perspective data to clarify operationalized procedures and connect disjointed accounts. Collectively, information from these groups informed the study, describing tangible and intangible outcomes, such as avoidable health declines, revictimization, and the provision of essential care and services, indicating gaps in procedures or a need for policy revision.

### **Definitions**

*Activities of daily living (ADL)*: Newnham et al. (2021) described ADLs as the mobility and capability to perform essential life functions such as self feeding, hygiene, and toileting. Individuals with physical or cognitive limitations may require assistance to perform these daily activities.

*Assistant Secretary for Preparedness and Response (ASPR)*: As a U.S. Department of Health and Human Services (HHS) component, the ASPR's responsibilities include collaborating with stakeholders in national public health disasters and medical emergency response efforts (Office of the ASPR, 2021).

*Disaster*: Disasters are major events that disrupt or destabilize geographic areas and may result in population, environmental, financial, or property losses (Clarke et al., 2021).

*Disaster case management:* Disaster case management facilitates human level social services assistance to boost resilience and promote recovery (FEMA, 2019). Interventions to bridge identified needs gaps may include ADL assistance, emotional support, or benefit registration (FEMA, 2019).

*End stage renal disease (ESRD):* ESRD refers to a life threatening medical condition in which kidneys cease removing toxins and excess bodily fluids (Lempert & Kopp, 2019). Treatment options are limited to regular dialysis treatments or kidney transplants (Lempert & Kopp, 2019).

*Federal Emergency Management Agency (FEMA):* As a U.S. Department of Homeland Security (DHS) component, FEMA is the principal federal disaster response agency for federally declared emergencies or disasters of any scale (FEMA, 2021a). Additionally, FEMA's mission includes assisting communities to prepare for and recover from incidences (FEMA, 2021b, 2021c).

*Hemodialysis:* This medical procedure replicates the renal system's critical task of filtering toxins and excess fluids from circulating blood (Lempert & Kopp, 2019). Treatment sessions may average 4 hours and are performed approximately 3 days per week (Lempert & Kopp, 2019).

*Nongovernment organization (NGO):* NGO discussions collectively refer to the broad range of community support organizations, such as humanitarian, medical, or faith based operations (Moke & Pfeiffer, 2018). Within the context of disaster management, incorporating NGOs into government operations increases the capacity of readiness, response, and recovery efforts (Moke & Pfeiffer, 2018).

*Nonmedical attendant (NMA)*: Also identified as caregivers, NMAs accompany displaced individuals with physical or cognitive challenges to assist with activities of daily living (Military Health System, 2016)

*Nonstate territory*: U.S. territorial status is a legally determined description of sovereign governments, which are under the authority of the U.S. government (Central Intelligence Agency [CIA], 2021). Territorial status describes intergovernmental relations between the United States and the USVI in state versus territorial rights, privileges, representation, and constraints (Rodríguez-Vilá et al., 2017).

*Resilience*: The World Health Organization (WHO) characterized resilience, in part, as a community support system's capacity to recover from a hazardous assault, maintaining or rehabilitating its essential infrastructures (Clarke et al., 2021).

*Social determinants of health (SDH)*: SDH describes conditions and circumstances that surround and influence an individual's health, longevity, and quality of life. SDH reflects public policy and includes demographics, environmental factors, inequities, and discrimination (Islam, 2019; Lathrop, 2020).

### **Assumptions**

A few assumptions were germane to this research. Presuming that participants in this case study would recount their experiences honestly and without fear of reprisals, antigovernment malicious intent, or financial benefit was particularly critical to research trustworthiness. The perspective of the dialysis evacuee was paramount to humanly contextualize the study, thereby promoting person centered systemic changes in the government's disaster response policies and procedures. Sourcing other knowledgeable



representatives (i.e., accompanying NMAs or community members) expanded the universe of potential information sources. This additional flexibility was planned because it was reasonable to assume that the criticality of the evacuee's health may have devolved into increased morbidities or mortalities. Moreover, it was anticipated that some potential participants may be unavailable if listed as missing or impacted by the global coronavirus pandemic. Knowledgeable individuals were vital to understanding response activities' impact on survivors, whether intended or inadvertent. Therefore, although influenced by human beliefs and emotions, the unique insights of individuals with intimate knowledge enabled the study to reach valid conclusions regarding shortfalls in, consistencies with, or departures from established government procedures.

### **Scope and Delimitations**

The federal government led the public-private collaborative disaster response, including strategy development, coordination, and oversight. This study inquired whether significant needs gaps were foreseeable, unmitigated, and resulted in avoidable harm to evacuated dialysis patients. I also sought to determine whether quality deficits and harm were attributable to the federal disaster management program as it existed in 2017. Nonhemodialysis patients were excluded from the study because dialysis patients from the USVI were the sole population subgroup selected for extraction.

A refined focus on circumstances surrounding the hemodialysis evacuees was integral to distinguish socioecological system component involvement. This was appropriate because the experiences of the intervention focus (i.e., the evacuees) would enhance understanding programmatic sufficiency and intervention quality, which

included each socioecological system. This population subgroup's complex clinical and social needs necessitated carefully coordinated transitions of care, disability-accessible accommodations, renal diets, and ADL assistance arrangements. As such, strategies and outcomes relative to the USVI dialysis evacuees contained generalizable considerations to edify and improve disaster management programs reducing undue harm to future populations impacted by natural disasters.

### **Limitations**

One of the first research limitations that became clear was the inaccessibility of government documents or information specific to the disaster management program that governed the 2017 Hurricanes Irma and Maria response and recovery facilitation. Expanded and repeated literature searches mitigated the impact of unfilled Freedom of Information Act requests, deactivated websites, and otherwise inaccessible materials described later in the Literature Review Search Strategies. Additionally, the subsequent global coronavirus pandemic likely reduced the publication of disaster response source literature, including research, as foci and resources were needed to combat the international public health crisis.

Bias jeopardizes the validity of the study design and findings. Potential biases relative to this study could have emerged from my familiarity with the USVI and involvement in the disaster response. However, this potential bias was abated because my roles did not involve the evacuation process or dialysis patients. The history of alleged government abandonment and disparities in the aftermath of prior hurricanes may result in participant bias and influence interview responses (Boersma et al., 2021; Honoré,

2020; Tierney et al., 2006). Participating respondents may have expected disparate treatment based on factors such as race or economic status, altering perceptions. To identify or preclude respondent bias, strategies included incorporating confirmatory or refuting alternative sources into the research and careful questionnaire crafting to preserve the integrity of the study (P. Fusch et al., 2018). This research project's capacity to reduce disparities and promote improved health, safety, and wellbeing of devastated survivors was a significant driver to include bias controls in the study design and execution.

### **Significance**

Available information supported concerns of worsening hydrological events increasing public health and safety threats. FEMA's (2021a) documented increases in disaster declarations suggest a reasonable expectation of continued escalation in coordinated mitigation activities (Knutson, 2019; Knutson et al., 2020; Shultz et al., 2019). The Insurance Information Institute (2021) noted 10 hurricanes in 2017; four made landfall in the United States. In the three subsequent years, the United States endured the assaults of 50 climate-related disasters, exceeding \$1 billion in damages (Office for Coastal Management, n.d.). Hurricane Maria alone was accountable for more than 2,900 morbidities (Office for Coastal Management, n.d.). As such, informed readiness to respond appropriately to impacted areas remains a local and federal government responsibility. Although hurricane risks do not extend to all U.S. geographies, all are at risk of natural disaster impact of some type.

Therefore, optimizing the response capacities has broad based implications and transferability. Informed disaster management minimally includes integrating threat assessment into actionable mitigation tactics. An immersive review of the 2017 hurricane response and recovery readiness can reduce disaster management program weaknesses by incorporating lessons learned into actionable, goal oriented revisions. Programmatic improvements based on high quality data, including current risks, align with morbidity and mortality reduction strategies and community reentry. Such revisions are warranted because discrepancies between meeting the needs of surviving vulnerable populations and policies have continued to emerge (Honoré, 2020; Laska et al., 2018; Zomorodi, 2020). This study is consistent with existing literature promoting government priorities reconsiderations to reduce response inequities. Researchers have agreed that elderly, low income, and disabled individuals are at high risk of reduced disaster survival and recovery (American Red Cross and American Academy of Nursing, 2020; Honoré, 2020; Horner et al., 2018; Laska et al., 2018). The USVI dialysis evacuee demographics were consistent with this high risk group determination and appropriate for response equity research. The federal disaster management program can extend beyond obscure and cursory directives, address predictable vulnerability threats, and integrate due diligent data into updated procedures reflecting informed restabilization options and considerations.

### **Summary**

In August 2017, Hurricane Irma ravaged the Caribbean, followed by Hurricane Maria within 2 weeks, destabilizing all USVI infrastructure systems, including

government operations and population support systems. Consequently, the federal government coordinated and led an all-of-government, whole community response, integrating public and private entities into a unified disaster response force. Because the storms disrupted the healthcare delivery system on the island territory, hemodialysis patients were evacuation foci for transport to the U.S. mainland for life sustaining treatment. The ultimate location and wellbeing status of each evacuee, relocated by the federal government, was unclear, indicating insufficiencies in the national disaster management policies or implemented procedures.

The purpose of the federal disaster management program was to support overwhelmed local governments when disaster response capabilities were insufficient to mitigate incident impacts. However, operational planning did not consistently bridge preventable needs gaps. To that end, in this study, I explored the sufficiency of the federal disaster management program's maintenance, oversight, comprehensiveness, and actionability to identify causal factors. Unactionable plans are counterproductive, whether caused by insufficiently detailed descriptions, misalignment with goals, poorly performed tasks, or other hindrances. Archbishop Desmond Tutu (n.d.) lamented the futility of retrieving individuals from a river without understanding causation. Reducing the recurrence of avoidable disadvantageous outcomes, attributable to operationalized procedures, remains a time sensitive concern as there are no indications of reduced natural disasters.

Improvements to federal disaster management components can also trigger informed updates and revisions to state and municipal governments and private

institutions' incident management programs. These systemic changes can translate into strengthened interoperability of future public-private response collaborations. The literature review in Chapter 2 described the interactivity and intersystem influences of public and private ecological social systems. Understanding these systems of engagement enabled the case study research to examine the priorities, roles, responsibilities, and inhibitions of interjurisdictional, interagency participation as a unified community response force. The all-of-society, encapsulating ecological model structure within the case study research design and methods are detailed further in Chapter 3.

## Chapter 2: Literature Review

Hurricanes Irma and Maria devastated several Caribbean islands in the Fall of 2017. Within 2 weeks, the Category 5 storms caused unprecedented devastation to PR and the USVI (Blake, 2018; Chowdhury et al., 2019; Cox et al., 2019; Einbinder, 2018; FEMA Public Affairs, 2017; FEMA, 2018a; GAO, 2019b; Larson et al., 2020; NASEM, 2020b; USVI Hurricane Recovery and Resilience Task Force, 2018). The combined impact destabilized USVI government operations and disrupted all critical infrastructure capacities, including public health and healthcare delivery systems (FEMA, 2018a; Larson et al., 2020; Stripling et al., 2018; USVI Hurricane Recovery and Resilience Task Force, 2018). Continuing research on the 2017 hurricanes and coronavirus pandemic, coupled with government materials availability scarcity, were likely significant contributors to the literature gaps specific to the USVI operations and outcomes.

Nevertheless, the available materials helped formulate an understanding of the 2017 iteration of the federal disaster management program. Fundamental comprehension of the disaster management structure was needed to perceive causal linkages between federal policies and survivor outcomes. Consequently, this chapter includes the conceptual framework leveraged to explore systemic structures, integral and prominent in descriptive literature. Also, subsequent narratives describe content reviews, sourcing, related research, and report summaries, revealing what was known and unknown regarding the federally led disaster response operations specific to the dialysis patient evacuation and extended displacement.

### **Description of Literature Review Search Strategies**

The search for relevant literature centered on materials relevant to evacuating dialysis patients from the USVI following Hurricanes Irma and Maria. Specifically, search strategies targeted referential materials regarding the federal disaster management program development and response operations. Methods to identify potential repositories of pertinent information sources included searches of websites for government and NGO, academic, community-support, and open source entities, such as news media or podcasts. Additional sources targeted for focused reference search methods included publications by emergency and disaster response entities and professional organizations.

Chain reference techniques facilitated the identification of relevant materials. Scans for background materials, such as descriptive information regarding the U.S. disaster preparation and policy development, necessitated a historical literature search. Government document revision dates and chain referencing methods indicated that some potentially relevant information remained unpublished. Therefore, Freedom of Information Act requests were submitted to the U.S. Census Bureau and HHS to obtain otherwise inaccessible documents. Lastly, strategies to obtain full documents for abstract only materials that suggested uniquely relevant content included submitting direct requests to the authors and via Walden University's library document delivery service. The compiled materials provided a framework and keywords for seeking peer reviewed materials specific to the government's command and control of the disaster response efforts reaching literature content saturation.



Scans for peer reviewed literature included the following repositories: The American Association for the Advancement of Science (AAS), Cumulative Index for Nursing and Allied Health Literature (CINAHL), Elton B. Stephens Company (EBSCO), Google Scholar, National Academies Press, PubMed, Research Gate, Science Direct, the University of Delaware Disaster Research Center, and the Walden University Library. Search terms and keywords used for repository scans included the following: *United States emergency response, United States disaster response, Hurricane Maria, Hurricane Irma, 2017 hurricane, US Virgin Island hurricane, USVI hurricane, federal disaster response, 2017 disaster response evacuation, US Virgin Island evacuation, and dialysis evacuee*. Searches of federal repositories and websites were limited to emergency and disaster response programs and included the previously noted keywords. These archives included the Center for Homeland Defense and Security (CHDS), congressional hearings, Homeland Security Digital Library (HSDL), and government agency websites. The remainder of this chapter captures the summarized results of the above literature search strategies regarding the development and operationalization of the federal disaster management program.

### **Conceptual Framework: Ecological Systems**

The whole-of-society involvement in the 2017 readiness, response, and recovery activities was uniquely aligned with socioecological systems models. Bronfenbrenner's (1979) ecological systems model described three societal levels (i.e., macro, meso, and microsystems) of interactive influence and engagement (Cash et al., 2019; Sallis & Owen, 2015). Community based mesolevel structures, described as aggregated

microlevel components, functioned as a critical multidirectional conduit, bridging the gap between the disconnected macrolevel government and microlevel individuals (Bronfenbrenner, 1979; Kitagawa, 2019). Later theorists and researchers expanded the ecological model to five levels, bisecting the micro and mesolevel systems (Coreil, 2010; McLeroy et al., 1988). Nevertheless, the original three tiered ecological model provided a more appropriate conceptual framework for this study, corresponding with the three social systems involved in the disaster response.

Because the ecological model emphasized encapsulated roles and intersystem influence, this model also facilitated causation examinations. For example, inadequate intersystem cooperation between social system dialysis centers and population supporting public transportation systems may delay evacuations (Coreil, 2010). Cash et al. (2019), Sallis and Owen (2015), and Narayanan (2020) concluded that disaster policies should explore potential vulnerabilities at the interpersonal level. This was suggested because policy level actions can alter or nullify the disconnected interpersonal environments in which activities take place, creating needs gaps (Cash et al., 2019; Sallis & Owen, 2015; Narayanan, 2020). This multilayered approach provided structural support for community based disaster readiness planning, resource sufficiency determinations, vulnerabilities, and outcomes research because of the scalable and comprehensive framework (American Red Cross and American Academy of Nursing, 2020; Furman et al., 2021; Honoré, 2020; Kirschenbaum, 2019; Kitagawa, 2019; Narayanan, 2020). An ecological conceptual framework is conducive to research designed to explore the ramifications of the

government led, all-of-society disaster response operation and reveal potential linkages to evacuee outcomes.

### **Key Concepts**

Disasters are inherently destabilizing forces of severe consequence and are neither self correcting nor self limiting. Risk informed readiness is essential to interrupt cascading impact aftereffects and mitigate adverse outcomes. The primary concepts that guided this literature review included understanding how knowledge of the nature of disasters drove the government's actions to protect the health and safety of its citizenry and the results of those policy level decisions. Specifically, the aim of this review was to identify whether the 2017 response and evacuation of USVI dialysis patients were sufficient for the survivors' safe, equitable, and dignified care based on adequate preparedness and informed coordination.

### **Nature of Hurricane Disasters**

FEMA defined catastrophes, in part, as extraordinary events caused by natural phenomena, sufficient in scope or scale to generate high human impact levels (FEMA, 2018b; Larson et al., 2020). Disastrous conditions such as these diminish the local community or government's ability to mount effective impact mitigation actions unilaterally. In preparation, the United States developed processes to abate the impacts of high consequence events when local restabilization capabilities are insufficient. Federal involvement reflects incident outcomes that exceed local capacities to meet urgent needs.

The federal disaster management process begins when incident specific assistance requests from the senior executive of the state, tribe, or territory result in a presidential

emergency or disaster declaration (Disaster Relief Act, 1974; Leeman, 2017; Robert T. Stafford Disaster Relief and Emergency Assistance Act, 1988; DHS, 2016a, 2016b). Criteria for declarations may include high casualty numbers, substantial environmental damage, or critical infrastructure interruptions that impact the population, morale, economy, or substantially impede government operations in a specified geographic locality (FEMA, 2018b). Decision makers may have leveraged informative research and threat assessments to maintain disaster management preparedness. Such information should have forewarned Hurricanes Irma and Maria's overwhelming impact on the USVI.

The United Nations raised awareness of disaster risks to isolated areas over a decade before Hurricanes Irma and Maria devastated multiple Caribbean nations (Pelling et al., 2004). The global association advised that relatively localized incidents can threaten government stability when combined with other factors, such as fiscally fragile economies and a substantial portion of the population negatively impacted by SDH factors (Pelling et al., 2004). Shultz et al. (2019) continued the concern, highlighting the increased susceptibility of developing island nations, such as the USVI, to experience catastrophic outcomes from hydrological events. The nature of hurricanes differs from that of other natural phenomena in terms of trajectory predictability and advanced preparation time. According to Pasch et al. (2019) and Pokkriyath et al. (2020), technological advances provide an estimated 3 day notice before hurricane impacts. Although the Caribbean disaster may have been foreseeable, given the anticipated impact and the fragile stability of the territorial islands, reasonable expectations for individual

self preservation were less clear, considering the prevalence of socioeconomically challenged island dwelling citizens in harm's way.

The United States federal oversight authority encompasses seven discontinuous and isolated states and territories: Alaska, American Samoa, Guam, Hawaii, the Northern Mariana Islands, PR, and the USVI (Gershon et al., 2021; Roman-Basora & Bland, 2020). All five nonstate territories experienced significant hydrological events in 2017 or 2018 (Roman-Basora & Bland, 2020). These events further supported the need to improve readiness to address the increasing number and complexity of natural or manmade events, resulting in declared national disasters (FEMA, 2021a; Knutson, 2019; Knutson et al., 2020; Shultz et al., 2019). Trends in declared disasters provided sufficient rationale to review and improve the quality of policies and procedures relative to isolated and nonstate territories. It was unclear whether alerts, cautions, warnings, or recognized vulnerabilities prompted programmatic updates, such as policy changes or data informed procedure revisions, in the years preceding the 2017 hurricane season.

Although geographically isolated states and territories had similar natural disaster risks as contiguous areas, their additional vulnerabilities challenge response planning. Predictably, the USVI's preexisting vulnerabilities (i.e., geographic isolation and logistics, a fiscally challenged local economy, a substantial portion of the population experiencing negative SDH consequences, federal policy and legal disparities between U.S. territories and states, and multiple natural hazards) combined with the high velocity storms to have a devastating impact on the USVI's solvency and resilience capacity (Austin, 2018; CIA, 2016; Gillum, 2018, 2019; Lichtveld, 2018; NASEM, 2020b;

Navarro, 2018; Office of Retirement and Disability Policy, n.d.; Pelling et al., 2004; Roman-Basora & Bland, 2020; Stripling et al., 2018; USVI Hurricane Recovery and Resilience Task Force, 2018; Veenema et al., 2019). For example, longstanding multifocal challenges in the USVI and PR likely contributed to insufficient essential infrastructure maintenance, enhancing the foreseeability of critical systems failures (Austin, 2018; DHS, 2011; Gillum, 2019; Pelling et al., 2004; Shultz et al., 2019). As such, degraded community support systems reduced mitigation asset availability and resilience capacities. In addition to stability and resilience threat surveillance, disaster readiness should have leveraged lessons from previous hurricane disasters and isolated or territorial events as data rich programmatic information sources.

### **Historical Context and Precedence**

A review of relevant antecedents from 1992–2016 provided insight into the key elements that may have influenced the national disaster management program as experience based gained knowledge. Specifically, Hurricanes Hugo, Katrina, and Sandy revealed content to understand data available to inform the federal disaster program development, revisions, and the Caribbean response strategy. Because outcomes, legislative actions, and executive decisions inform federal policies and procedure development, deviations or adherence to programmatic specifications become apparent when compared to performed activities. In addition to applying lessons learned to improve public-private response capabilities, these storms provided insight into potential USVI mitigation concerns, such as equity assurance, SDH impact, and disconnects between the population and government representatives.

### ***Hurricane Hugo***

Hurricane Hugo landed on St. Croix in 1989 as a Category 4 hurricane (Cox et al., 2019; Navarro, 2018; USVI Hurricane Recovery and Resilience Task Force, 2018). The catastrophic impact and response shortfalls in 1989 foreshadowed some 2017 incident challenges. Response lapses, described by Tierney et al. (2006), included alleged island-to-island discrepancies in the local territorial government's response. According to Tierney et al., the hurricane survivors' dissatisfaction with the USVI government's response was likely fueled by preexisting socioeconomic inequities, community distrust of the government, and substantial messaging failures. Furthermore, the study found that the St. Croix population neither expected support from the local government nor received information to suggest that assistance was forthcoming (Tierney et al., 2006). USVI's unique history, including the aftermath of Hurricane Hugo, population needs, and challenges of the territory comprised of discontinuous islands, could have minimally informed communications, logistics, and evacuation strategies in 2017 (Kirschenbaum, 2019; NASEM, 2020a; Olszewski & Siebeneck, 2021). The literature did not describe targeted remedies to ameliorate local distrust of governments or disparities.

### ***Hurricane Katrina***

Hurricane Katrina struck the southern portion of the United States in 2005, prompting a federal response and evacuations of New Orleans, Louisiana (Anderson et al., 2009; *Examining HHS's public health preparedness for and response to the 2017 hurricane season*, 2017; Horn & Kirsch, 2018; Kutner et al., 2009; Quarshie & Leuschner, 2018). The 2005 New Orleans population demographics, hydrological impact,

and survivor experiences were comparable to the USVI in 2017. Survivors of these storms reported disparate experiences with the response effort and adverse outcomes, including missed dialysis treatments and community displacement (Anderson et al., 2009; Bonilla-Félix & Suárez-Rivera, 2019; Carlson, 2018b; Davis & Kopp, 2015; Horn & Kirsch, 2018; Laska et al., 2018; Lichtveld, 2018; Shimel, 2018a; Zomorodi, 2020). Although public outcry prompted some federal executive and legislative changes, commitment to sustained response operational improvements was unapparent in 2017.

The Post-Katrina Emergency Management Reform Act (2006) initiated substantial changes to the federal disaster management program, including creating the National Preparedness System (NPS). The Act directed FEMA to maintain readiness through ongoing assessment, data analysis, and corrective strategies for identified programmatic shortfalls in collaboration with the NCD and the National Advisory Council (Post-Katrina Emergency Management Reform Act, 2006). The Post-Katrina Emergency Management Reform Act (2006) law, which included nonstate territories, expanded the agency's programmatic roles and responsibilities, including the following directives:

- FEMA must collaborate and fund training with federal partners, local authorities, and NGOs.
- FEMA must broaden its logistical capacity for mass egress to relocate entire population segments from impact zones.
- FEMA must ensure mobility and communications strategies target the accessibility, mobility, and language needs of impacted populations.



- FEMA must establish a national registry and locator system for family reunification.

These changes would be integral to Caribbean disaster management operations. Although Hurricane Katrina provided crossover comparisons to the USVI hurricane survivors' diaspora, Hurricane Sandy informed strategies specific to dialysis patient management strategies.

### *Hurricane Sandy*

Hurricane Sandy impacted the densely populated New York and New Jersey states in the fall of 2012 and provided a test of the collaborative public-private disaster response directive, codified after Hurricane Katrina (Davis & Kopp, 2015; Lempert & Kopp, 2013; Post-Katrina Emergency Management Reform Act, 2006). Powell et al. (2012) and Quarshie and Leuschner (2018) found that the rapid federal response, enhanced by integrating NGO community support entities, resulted in a primarily successful collaboration across the socioecological system spectrum. One such successful public-private response effort was the communications bridge between community based dialysis centers and the federal government supported by The Kidney Community Emergency Response coalition (ASPR, 2018b; Lempert & Kopp, 2013). Lessons from these storms illustrated the value of high quality communications, risk recognition, ecological system partnering, and compassionate responder-survivor engagement to inhibit harm and revictimization of survivors (Coreil, 2010; Honoré, 2020; Laska et al., 2018; Sallis & Owen, 2015). The literature did not indicate that federal policies were revised to target the most vulnerable population segments. For that reason, additional

research may identify morbidity and mortality threats to high risk communities, spurring programmatic improvements.

### **Responsibility and Readiness**

A review of the federal disaster management program and relevant literature supported an understanding of methods to build resilience by prevention, readiness, and collaborative whole-of-community strategies. Although local municipalities remained first responders, the Robert T. Stafford Disaster Relief and Emergency Assistance Act (1988) provided an avenue of incident specific, federal support to preserve lives and livelihoods when local resources were overwhelmed or expended. Notwithstanding, it was unclear if local and national programs were complementary or comprehensive. For example, VITEMA's risk assessment did not seem to reflect the increased velocity or the number of severe hydrological events attributable to climate change (Knutson et al., 2019, 2020; Shultz et al., 2019; Veenema et al., 2019; VITEMA, 2016; Zomorodi, 2020). It was also unclear if the federal government scrutinized the quality of the 2016 local threat assessment and abatement plans, which could have informed federal efforts by revealing potential population vulnerabilities. Undetected shortfalls within VITEMA's emergency management plans may have jeopardized the actionability of federally led joint operations.

The publicly available NRF furthered understanding of the federal disaster management expectations and strategies as a resource to inform local emergency management, NGOs, researchers, and individual preparedness. As a reference, the NRF reflected the distilled authoritative and influential materials, including executive

directives, legal requirements, and precedent outcomes (DHS, 2016b; Division of Civil Rights, 2020; Obama, 2011). Although the 2016 NRF provided the structure and guidance for the public-private Caribbean response, the subordinate FIOPs added specificity to inform person level, incident-specific strategies, including evacuation procedures (ASPR, 2016; DHS, 2016a, 2016b). Advanced strategy cognizance, enabled by transparency, could have reduced uncertainty and chaos among integrating response-supporting entities in the storming phase and enhanced interoperability (Kutob & Alhothali, 2020). Effective disaster management injects intentionality into unified efforts, ensuring participants are aware of their roles and amenable to supporting the collective mission.

### **Human Consequences of Policy Level Decisions**

Because federal policies establish the framework for procedure development and compliance-supporting activities, such as training, population focused policies indicate response priorities. Accordingly, Kirschenbaum (2019), Ha (2019), and Thornton et al. (2021) warned of public policy susceptibility to political influence and consequential increased disaster survivor vulnerabilities risk. Shifts in political priorities and fiscal austerity measures alter response capacities and by extension, impact the resilience and perhaps survivability of underserved populations and communities (Banerjee & Williamson, 2020; FEMA, 2016; Hulse, 2011; Inserra et al., 2018; Lichtveld, 2018; Kirschenbaum, 2019; Obama, 2011). Long term fiscal constraints may have prompted austerity measures, including insufficient maintenance of the USVI's critical infrastructures (Artiga et al., 2018; *Examining HHS's public health preparedness for and*

*response to the 2017 hurricane season*, 2017; Roman, 2018; Roman-Basora & Bland, 2020). The literature described disparities inherent in, or consequential to, federal policies, which influenced the USVI's preimpact stability, the Caribbean disaster response, and potentially, recovery operations.

Policy level disparities between mainland states and the USVI territory (e.g., nonstate status, limited political participation and representation, and concerns regarding inequities in the reimbursement rates for Medicare and Medicaid) may have been instrumental in the fragility of the USVI's public health system, resulting in inhibited access to funding and the outmigration of healthcare professionals (Artiga et al., 2018; *Examining HHS's public health preparedness for and response to the 2017 hurricane season*, 2017; Inserra et al., 2018; Islam, 2019; Lichtveld, 2018; Narayanan et al., 2020; NASEM, 2020b; Navarro, 2018; Rodríguez-Vilá et al., 2017; Roman-Basora & Bland, 2020; USVI Hurricane Recovery and Resilience Task Force, 2018). Artiga et al. (2018) suggested that federal policies resulted in the outmigration of USVI health professionals, which may have contributed to population health declines. Outdated policies, reflexive legislation, or executive actions, sans causal sequence consideration, can unnecessarily compound the victimization of underserved communities and complicate effective resilience strategies (*Examining HHS's public health preparedness for and response to the 2017 hurricane season*, 2017; Honoré, 2020; Kirschenbaum, 2019; Lichtveld, 2018; Pelling et al., 2004; Roman, 2018; Roman-Basora & Bland, 2020). Such policy level decisions may have exacerbated state versus territorial disparities leading into 2017 and reduced territorial capacity to attain economic stability (Austin, 2018; Roman, 2018;

Stripling et al., 2018). Consequently, the USVI's physical, social, and political infrastructures were insufficient to withstand the dual hurricanes.

### **Operational Oversight**

The operationalized disaster management policies reflect the understanding of the nature of disasters to frame response strategies and promote optimal survivor outcomes. Specifically, sourcing dialysis evacuee end results and experiences may reveal policy directed response operations quality. The upscaled USVI disaster management operation in 2017 was unprecedented in the scope of mitigating entities to address the magnitude of damage, including the high number of adversely impacted critical support systems (ASPR, 2018a, 2018b; FEMA Public Affairs, 2017). This added activation of abatement resources was consistent with incident-specific, scalable response procedures, but mitigation asset availability did not ensure resource utilization quality or goal attainment.

After action reports and publications indicated that dialysis evacuees experienced undue hardships and disparities, despite the additional resources allocated. Allegations of lost evacuees, reportedly missing from HHS custody, suggested significant procedural development lapses or adherence and operational failures (Cangialosi et al., 2018; Carlson, 2018b; GAO, 2019d; Pasch et al., 2019; Roth et al., 2018; *The historic 2017 hurricane season impacts on the U.S. Virgin*, 2018). The following sections of the literature review summarized the limited available information, illustrating the disaster response operational quality, as indicated by the USVI dialysis evacuation management.

### ***Evacuation Strategy Development***

Specialized subject matter expert teams from various agencies were activated to effectuate the evacuation strategy under federal authority. The logistical strategy included transporting evacuees from St. Croix and St. Thomas to San Juan, PR, followed by interim housing in mass shelters before relocating to various locations (ASPR, 2018a; *Examining HHS's public health preparedness for and response to the 2017 hurricane season*, 2017; NCD, 2019). As HHS's evacuation support components, the National Disaster Medical System and the U.S. Public Health Service, with Department of Defense transportation assistance, were tasked with evacuee care, safety, and social support while in the extended custody of the agency (ASPR, 2016, 2018a, 2018c; DHS, 2016a; *Examining HHS's public health preparedness for and response to the 2017 hurricane season*, 2017; FEMA, 2003; GAO, 2019d; Kim et al., 2020; Sumpter et al., 2018; *The historic 2017 hurricane season impacts on the U.S. Virgin Islands*, 2018). Custodial care included civil rights protections, medical social services, and disability accommodations. Federal statutes, laws, regulations, and policies further protected evacuees' rights to self determination, dignity, equity, and freedom from unnecessary institutionalization or retaliation for exercising their rights (Division of Civil Rights, 2020; NCD, 2019). Despite federal policies and regulatory protections, the performed evacuation strategies may have infringed on evacuee rights and unnecessarily jeopardized evacuee safety. Such breaches increase risks of decompensation, transfer trauma, and other adverse outcomes while in the care and custody of the government.

The 2016 NRF and the Response FIOP revisions, which governed the 2017 response, may have insufficiently sourced regional geographic threats or population vulnerability data. Effective information management includes data validity and aligns with evacuee experiences because due diligence informs strategic plans and tasking decisions (Ha, 2019; Kim et al., 2020; Kirschenbaum, 2019; Narayanan et al., 2020). Consequently, evacuee outcomes reflect national policies and priorities. As evident in the literature, inconsistencies in data management quality and information fusion were noted in the 2005 and 2017 hurricane responses.

Accordingly, programmatic reviews and revisions were needed to improve local and federal disaster readiness, instructional guidance, and response operational oversight to ensure the safety of the diverse United States communities. Laska et al. (2018) and Jerolleman and Graves (2020) found that disaster operation strategies informed by myths, bias, inaccurate information, and intentional deviations from programmatic specifications contributed to Hurricanes Katrina and Maria survivor revictimization. Moreover, disaster research consistently concluded that strategies that fail to operationalize socioeconomic and cultural competence diminish community recovery and survivor outcomes (Jerolleman & Graves, 2020; Laska et al., 2018; Mace et al., 2018; Quarshie & Leuschner, 2018; Roth et al., 2018; Wolshon et al., 2019). Lessons learned regarding using valid due diligence to inform assignment delegation and oversight strategies are extrapolative to the USVI evacuation research.

After storm damage and subsequent power outages rendered dialysis centers inoperable, the rapid evacuation of the USVI hemodialysis patients became a response

priority, necessitating a meticulously strategized and coordinated operation (*Examining HHS's public health preparedness for and response to the 2017 hurricane season*, 2017; GAO, 2019d; Vora et al., 2018). Consequently, dialysis center personnel filled a vital bi-directional ecological communications role, collecting and conveying ground level truths to inform incident management's situational awareness (ASPR, 2018b; Lempert & Kopp, 2013; Moke & Pfeiffer, 2018). Although this was consistent with whole community response principles, it was not apparent that the federal disaster management reciprocated with transparent communications to local officials, mesolevel partners, or microlevel survivors (Frykmer, 2020; NASEM, 2018; Olszewski & Siebeneck, 2021; Quarshie & Leuschner, 2018; Roth et al., 2018). These breaches in communications insinuated omissions in procedure adherence or operational oversight. Further research was needed to reveal the quality of the meso and macrosystem collaboration and understand operational gaps resulting in detriment to survivors, including the insufficient tracking of evacuee movements.

### ***Evacuation Coordination and Collaboration***

The ESRD consortium was a pre incident, full ecological system collaborative, advocating for the health and safety of renal failure patients, functioning under the leadership of HHS. The public-private consortium included HHS's Centers for Medicare and Medicaid Services, the Kidney Community Emergency Response, ESRD Networks, and others into a unified emergency readiness, response, and recovery special interest group (ASPR, 2018a, 2018b, 2018c; Assistant to the Secretary for Preparedness and Readiness & The Centers for Medicare and Medicaid Services, 2017; *Examining HHS's*



*public health preparedness for and response to the 2017 hurricane season, 2017*; Lempert & Kopp, 2013). The consortium's strategies included maintaining operational oversight of the strategic evacuation planning, including evacuee chain of custody, logistics, resource allocation, and communications (ASPR, n.d.-b, 2018b; *The historic 2017 hurricane season impacts on the U.S. Virgin Islands, 2018*). Although the literature supported determinations that the macro-mesolevel consortium was well structured to operationalize programmatic components specific to ESRD patients, continuity of care following evacuation was underrepresented in publications.

Consequently, the integrated public-private collective may have provided a replicable template to spur subsequent consortium formation and inform response strategies. Specifically, lessons learned from Hurricane Sandy and studies by the American Red Cross and American Academy of Nursing (2020) and Mace et al. (2018) found that the ecological systems approach provided a supportive framework to address the needs of non ESRD survivors with disabling conditions (Lempert & Kopp, 2013). Therefore, promoting the formation of additional public-private disaster readiness and response coalitions could have improved resilience among vulnerable populations with chronic conditions or special needs. Although the consortium formation did not preclude evacuation response gaps, the collaborative communications and oversight structure was consistent with principles of whole community approaches directed by federal policies.

### **Critical Procedures and Outcomes**

Incidences of unmet needs and preventable health declines among the evacuees indicated the quality of person focused procedural guidance and activity performance

from the immediate predisplacement period to community reentry. Medical evacuations from the USVI began on approximately September 8, 2017, and continued until July 1, 2018 (ASPR, 2018a; Assistant to the Secretary for Preparedness and Readiness & The Centers for Medicare and Medicaid Services, 2017; GAO, 2019d; Larson et al., 2020; NCD, 2019; USVI Hurricane Recovery and Resilience Task Force, 2018; Vora et al., 2018; Shimel, 2018b). However, it was uncertain if the evacuation planning preceded the initial extraction of dialysis evacuees from their communities or if interventions reflected the medically fragile individuals in HHS's custody needs (Mace et al., 2018; Shimel, 2018a, 2018b; *The historic 2017 hurricane season impacts on the U.S. Virgin Islands*, 2018). This uncertainty was suggested because discontinuous arrangements (i.e., delays, multiple interim stays, and displacement from lodgings to accommodate responders) made a compelling case that the planning was incremental instead of goal oriented, prolonging in-travel status (ASPR, 2018a; Assistant to the Secretary for Preparedness and Readiness and The Centers for Medicare and Medicaid Services, 2017; Shimel, 2018a, 2018b; *The historic 2017 hurricane season impacts on the U.S. Virgin Islands*, 2018; Vora et al., 2018). Mace et al. (2018) found that protracted travel, complicated by nutrition, toileting, and physical discomfort, caused transfer trauma to frail individuals. Consequently, the medically unstable dialysis evacuees were at risk for travel associated clinical declines.

As written, the Response FIOP procedure specifications may have been insufficient to prevent avoidable harm attributable to protracted travel and lodging arrangements. Although the Response FIOP specified careful planning for medically

fragile evacuees, the described logistical plans excluded consistent conveyance risk mitigation; travel decision makers may have been external to HHS or unaware of transfer trauma risks (DHS, 2016b). In the aftermath of the evacuations, reports indicated that dialysis evacuees may have indeed sustained extended travel associated transfer trauma (ASPR, 2018a; Carlson, 2018a; *The historic 2017 hurricane season impacts on the U.S. Virgin Islands*, 2018). Underperformed or omitted patient movement strategies relative to care in custody, accommodations, and tracking of evacuee movement may have increased the health and safety risks to the hurricane survivors.

### ***Evacuee Movement Tracking***

Although the NRF and the Response FIOP directed evacuee movement tracking, variances in accountability suggested breaches in procedure development or adherence (DHS, 2016a, 2016b). HHS's United States Renal Data System (2020) noted 110 USVI hemodialysis patients in 2017. However, the reported number of evacuees ranged between 120-800 (Bonilla-Félix & Suárez-Rivera, 2019; *Examining HHS's public health preparedness for and response to the 2017 hurricane season*, 2017; GAO, 2019a; USVI Hurricane Recovery and Resilience Task Force, 2012; Vora et al., 2018). Moreover, federal investigations revealed that mechanisms established by the federal disaster management program for tracking evacuee movements were not in place before patient movements began, which may have contributed to ad hoc or omitted accounting of evacuees (GAO, 2019d). A GAO (2019d) report supported allegations of poor procedure development or adherence as the investigative agency concluded that the government could not account for the terminal locations of each evacuee. The absence of specified

accounting practices in the guidance and actualized operations may have contributed to underperformed evacuee movement safety measures and lost evacuees.

### ***Disaster Case Management***

Integrated and extended support for displaced survivors' daily needs was foreseeable, given the more than 1000 mile displacement and the significant healthcare delivery infrastructure repair needed before community reintegration. A preexisting mechanism for comprehensive social services within a disaster case management structure was incorporated into the federal disaster management program (DHS, 2016c; FEMA, 2019b). Functional actionability was supported, in part, by a specialized case management cadre of the U.S. Public Health Services' Service Access Teams (ASPR, 2018a, n.d.-a; U.S. Office of the ASPR, 2020; Surgeon General, n.d.; Vora et al., 2018). Despite this situational awareness and functional capability, disaster case management components to facilitate access to destination community services, medical care coordination, and family reunifications, was neither activated timely nor effectively operationalized (ASPR, n.d.-a, 2018b, 2018c; NCD, 2019; Roth et al., 2018). The extended displacement of the USVI survivors may have exposed federal policies and procedure lapses relevant to the nonmedical attendants. For example, funding allocations and coverage to obtain contracted services for evacuees may have been insufficient to cover the needs of the attendants, who were also without access to lifestyle support functions (e.g., banking, groceries, laundry, or pharmacy) while displaced (ASPR, 2018c; Roth et al., 2018). Research relevant to the operationalized role and efficacy of case management for the USVI evacuees, which may further determinations regarding the

quality and comprehensiveness of the federal disaster management program or inform revisions, was underrepresented in the literature.

### **Summary**

Leveraging cognizance of the nature of hurricanes to inform readiness and response strategies was essential to maximize survivor outcomes. Maintaining data informed, outcome focused policies and procedures was an iterative process, necessitating continued monitoring, information interpretation, and integration into actionable strategies. The 2017 Caribbean complex catastrophe and the USVI evacuation and recovery operations contributed a wealth of new knowledge to the literature, enhancing the knowledge base of decision makers and ecological disaster preparedness planning. This study specifically contributed to literature gap reduction relevant to the needs of vulnerable survivors of high consequence incidences, displaced for an extended time, and dependent on the government for all life and livelihood support.

However, further research was warranted to understand thematic factors derived from the role of disaster response policies, procedures, and practices in the person level experiences of the evacuees. A survivor focused, qualitative review was needed to reveal the comprehensiveness or inadequacies in the national disaster response program. The literature made a compelling case that strengthened resilience and reduced impediments, such as counterproductive public policies, improve disaster response efficacy and reduce adverse outcome risks. Research propels public health and emergency management literature forward, building on current understandings of causal factors for population outcome variances following similar hydrological incidences. The ensuing chapter

detailed the research methodology, as the finite nature of the 2017 Caribbean hurricanes and evacuation strategies were appropriate for qualitative case studies.

### Chapter 3: Research Method

This case study examined the adequacy of the national disaster management program's coordinated response to Hurricanes Irma and Maria in USVI. Because the unprecedented scope and scale of the devastation necessitated an unprecedented scope and scale of mitigation, valuable public health and safety lessons learned can improve disaster response operations and intersystem coordination. In addition to benefitting government disaster management coordination, extracted knowledge can help individuals and households develop realistic self-sustainment strategies and help agencies conceptualize actionable interagency disaster management programs. A comprehensive analysis of dialysis patient evacuations and prolonged displacement, representing significantly impacted and vulnerable natural disaster survivors, can improve the quality of interdisciplinary public health policies, procedures, and programs. This chapter describes the developed research methodology to comport with qualitative research rigor, preserving the integrity of the study.

#### **Design and Rationale**

This study centered on policies and procedures governing the hurricane disaster-driven evacuation of hemodialysis patients from the USVI beginning in the Fall of 2017. Although the Caribbean territories continued to recover from the cumulative impacts of Hurricanes Irma and Maria for an extended period, activities surrounding the evacuation were limited by time and place. According to Creswell and Creswell (2018), Harrison et al. (2017), and Patton (2015), phenomena confined by time, location, and activities are suitable for exploratory case study methods. Harrison et al. also described the value of

case study methods to include research across interdisciplinary professional lines. Indeed, the multidisciplinary and multijurisdictional Caribbean response and evacuation strategy was a whole-of-society operation.

As designed, this study probed the federal disaster management program's quality and sufficiency to prevent the revictimization and harm to hurricane survivors by examining the following questions:

- How did the national disaster management policies and procedures mitigate the impact of the 2017 Hurricanes Irma and Maria on the United States Virgin Island's vulnerable dialysis population?
- What procedures ensured, or failed to ensure, evacuees were provided with dignified, individualized care and services to support equitable access to daily living necessities while in the care and custody of the federal government?
- How did federal response procedures facilitate multiagency cohesion, promoting a safe extraction to reintegration continuum for evacuees?

An in depth analysis by case study methods was aligned with the research questions and real life implications of policies can emerge (Crowe et al., 2011). Moreover, this examination can drive transformative societal equity and augment or substantiate prior disaster management research.

Newly gained knowledge can inform or change interagency response coordination, reducing disparities and strengthening community resilience (Creswell & Creswell, 2018; Harrison et al., 2017). Societal level directives have significant ripple effects on the community and individual levels. Therefore, understanding power



differentials and decisional cause and effect were vital to spur positive systemic social change and reduce gaps between authorities and those impacted by effectuated directives (Cash et al., 2019). Rather than theorized policy sequelae, this study is suitable to enhance decision maker cognizance by illustrating the actual results of disaster management strategies. This heightened awareness may drive programmatic revisions to readiness, response, and recovery policies and procedures at each ecological system level.

### **Role of the Researcher**

My primary responsibility as an observant researcher was to preserve the integrity and validity of the study. Data collection, verification, and analysis consistent with qualitative research rigor were integral to the success of this project. This included participant and data protection. Deliberate and informed measures ensured compliance with approved research methods (e.g., adherence to university research ethics procedures, consistency with qualitative case study methods, and data security strategies). One potentially detrimental challenge to research quality and trustworthiness was uncontrolled bias (Creswell & Creswell; P. Fusch et al., 2018). To abate this threat, a continuum of bias surveillance and mitigation was integrated into each study phase.

As the data management instrument, my responsibilities included identifying and mitigating validity and cohesion threats. Periodic self reflection and participant vetting strategies were employed to identify data integrity threats, such as researcher influence or participants with counterproductive motivations (Harrison et al., 2017; Morgan-Trimmer & Wood, 2016; Schoch, 2016). As fallible humans, researchers are subject to biases based on their values, experiences, preferences, and expectations (P. Fuschs et al., 2018).

Forasmuch as my researcher role excluded extensive investigations regarding the motivations or veracity of interviewees, vetting suitable participants was indeed a crucial responsibility. Bias surveillance and controls were necessary components of this study's search for truth. Comparing the perspectives of interviewed participants with published literature relevant to the 2017 Caribbean response was also undertaken to detect intentional or unintentional objectivity deviations as fact patterns and themes emerged (Leahy, 2021). Representation from each socioecological system provided unique and rich qualitative data relevant to the operationalized disaster management policies and results. As such, implemented data management strategies (i.e., data collection, participant privacy protections, analysis, and security) were critical researcher role elements.

Power differentials threaten research integrity by interjecting undue influence into the various research phases, including study design, data collection, and analysis. Between 2015 and 2019, my duties as a federal employee included ensuring that the quality of care provided by dialysis centers met federal regulatory requirements and supporting ESRD network collaborations. I no longer have these duties or represent the government. Additionally, although I participated in the Caribbean response as a federal employee, my role was operationally separate from the evacuation process or patient interactions. Because I have no personal or ongoing relationships with USVI residents, survivors, or government disaster managers, I foresee no unmitigable ethical conflicts or researcher bias threats to the integrity of the study. Instituted integrity threat surveillance

and abatement strategies, such as reflexivity, participant vetting, study design, and triangulation, are discussed further in the Methodology section.

## **Methodology**

### **Participant Selection**

Information from knowledgeable sources, such as responders participating in the evacuation, supporting individuals, and evacuees, provided rich qualitative data relative to federal policy application and end results. Because operationalized procedures reflect presidential executive orders, legislation, and regulations, outcomes indicated the sufficiency of policy derived procedures. Consequently, gained comprehensive understanding of actions and outcomes at each ecological level, was facilitated through purposive sampling of involved participants from each systemic level (see Babbie, 2017; Cash et al., 2019; Harrison et al., 2017; Schoch, 2016). Representation from each systemic strata was consistent with qualitative case study methods of limited participants and the ecological conceptual framework (see Harrison et al., 2017; Sallis & Owen, 2015). This inclusive strategy leveraged various perspectives to address each research question collectively. Consequently, sourcing appropriate participants resulted in relevant data extraction.

It was understood that large numbers of suitable participants may have been unavailable to participate in the study, due to mortality or unknown ultimate locations of dialysis evacuees. Also, knowledgeable and involved government responders in federal service may be unable to participate or may present data validity risks. For example, if agencies limited commentary to agency public information officers, participation may

have resulted in reprisals or preference falsification, skewing the data. Preference falsification occurs when individuals mask their true opinions to conform with perceived expectations (Vedantam, 2020). Alternatively, former employees were solicited to fill this knowledge gap.

The clinically fragile condition of ESRD evacuees, coupled with the protracted recovery from the catastrophic event, may have significantly reduced the surviving population pool (Bonilla-Félix & Suárez-Rivera, 2019; Willoughby et al., 2017; Department of Bioengineering and Therapeutic Sciences, n.d.). To offset this potential deficit, knowledgeable individuals, such as family or community members, were recognized as viable microlevel qualitative data sources. The infrastructure damage caused by the hurricanes led to the closure of USVI dialysis centers and professional outmigration (Culbertson et al., 2020; USVI Hurricane Recovery and Resilience Task Force, 2018). The USVI dialysis center personnel dispersal was a known risk to secure suitable participants but the ESRD network's involvement expanded mesolevel data source options. Data from macro, meso, and microlevel participants were important to contextualize the sufficiency and real life implications of the applied disaster management program specifications.

### **Recruitment**

Solicitation of participants with intimate knowledge of policy derived activities and their consequences centered on the period immediately preceding the initial federally led extraction and extended through the dialysis patient discharge from HHS custody. Although discharges were performed throughout the continuum, the GAO (2019d)

determined that the evacuation phase extended from September 8, 2017, through July 1, 2018. Considering these factors, recruitment strategies and participant selection challenges specific to each ecological strata necessitated technique variations. Nevertheless, mindfulness of study integrity threats remained consistent throughout the research.

Macrolevel participant solicitation was limited to individuals whose roles directly involved evacuation planning, transport, care, or services in the period preceding extraction to discharge from HHS custody. Participation recruitment through social media and professional groups solicited willing and suitable participants. Snowball referral methods also expanded recruitment, as macro and mesolevel contacts suggested potential participants. Although USVI dialysis center personnel had uniquely valuable information regarding macro and microlevel collaboration, interactions, and outcomes, mesolevel service providers were unavailable or declined to participate. Consistency among the data sources and the cessation of new incoming information assured that saturation has been reached (P. Fusch et al., 2018).

### **Instrumentation**

Data sources included document reviews and interviews. These sources were vital to understand programmatic specifications, performed activities, and outcomes. In addition to U.S. government issuances, public health research and postdisaster investigations were data rich triangulation sources to correlate with emergent interview themes. Collectively, these data reveal the sufficiency of the program's development, maintenance, and actionability (Milanesi, 2016). As such, careful data management

planning, including ethics in research conduction, information extraction, and protection methods, was consistent with Walden University's Institutional Review Board (IRB) specifications.

Interviews with individuals involved in the evacuation enhanced the understanding of policy derived decisions, strategies, and outcomes. According to Roberts (2020), suitably designed surveys can reveal individual truths and historical meaning. Interview scripts were tailored to each ecological system to capture nuanced perspectives relative to the research questions (Bronfenbrenner, 1979; Roberts, 2020). See Appendix A for the interview protocol and questionnaire. This approach enhanced content validity through inclusive data sourcing and analysis (Ravitch & Carl, 2016). A pilot study plan was submitted to Walden University's IRB before data collection. The subsequently described pilot study was conducted to trial the quality and comprehensiveness of the interview script.

### **Pilot Study**

A pilot study to enhance the comprehensiveness of the interview protocol and questionnaire was conducted with individuals as representatives of the desired research study participants. The questionnaire trial included industry knowledgeable macro, meso, and microlevel system representatives who were uninvolved in the incident under review. Sourcing these individuals to test the researcher developed interview protocol allowed specialized knowledge gaps, undetected by the researcher, to emerge. Examples include the following:

- A former disaster responder provided unique insight as a macrolevel representative. Insider knowledge, such as programmatic specifications or unpublished training, informed questionnaire revisions and query design relative to unintended consequences or responses.
- A community based healthcare organization representative, familiar with corporate policies, helped to identify questionnaire probes that were ambiguous or inconsistent with mesolevel roles.
- Including a non Virgin Islander with chronic or debilitating healthcare needs, as a microlevel representative, provided insight into the suitability of the questionnaire wording and mitigated undesired outcomes, such as induced duress or privacy concerns. Also, sampling a non Virgin Islander preserved the potential participant pool sampling.

The overarching goal of the pilot study was to ensure the data collection instrument's capacity to meet reliability standards and address the research questions before meeting with study participants (P. Fusch et al., 2018). Moreover, unforeseen challenges or research design failures could become apparent (Roberts, 2020; Turner, 2010). In addition to exhaustive data extraction and avoiding respondent discomfort, McGrath et al. (2019) advised that a pilot study may indicate study scope migration threats.

### **Data Management and Analysis Plan**

The pilot study results drove quality improvements to the data collection and management processes. Video recording was excluded from the data collection strategy to conform with IRB specifications for participant privacy protections. Instead, audio-

only recorded interviews were performed. As informed by the pilot study, each interview was anticipated to conclude within 45 minutes. The engagement period also included an estimated 15 minutes for researcher verification of provided content and closeout.

The pilot study also supported improved strategies for maximized data extraction in minimized interview sessions. These improvements provided a basis for data analysis and a priori coding (Milanesi, 2016; Schoch, 2016). Moreover, the study guided interview and document review data categorization, thereby limiting analytical scope migration and retaining focus on the research questions. Answering participant questions, providing data security assurances, and informing of the study's upcoming stages in the post interview period signaled the conclusion of the respondent engagement.

Documentation regarding the federal disaster management program development and specifications augmented interview data to enhance the study's comprehensiveness. Archived and postimpact information posted on the three branches of the U.S. government and participating NGO websites coupled with published literature, provided high quality data relevant to this study. Data outliers unresolved by triangulation or clarification were excluded (see P. Fusch et al., 2018; Harrison et al., 2017; Patton, 2015). Data instrumentation design and information sourcing methods that failed to extract information relevant to each research question were remediated to avoid integrity and trustworthiness compromise.

### **Trustworthiness**

This study design was consistent with qualitative research rigor and sustainable social change to enhance access to care and services for survivors of catastrophes. In



addition to reliably informing public health policies relative to vulnerable populations, the study is replicable, providing a platform for future research. Methods of quality assurance (i.e., credibility, transferability, dependability, confirmability) were incorporated into the study configuration and well situated within the ecological conceptual framework (Elo et al., 2014; P. Fusch et al., 2018; Harrison et al., 2017; Milanesi, 2016). In addition to adherence to sound research design methods, the subsequent sections describe the ethical principles to preserve the integrity of the study and protect participants.

### **Credibility: Internal Validity**

The WHO described internal validity as the capacity to answer research study questions (Newnham et al., 2021). The triangulated effort to exhaustively collect and objectively analyze data and find truths related to events and actions surrounding the evacuation of dialysis patients from the USVI was a fundamental credibility assurance approach (P. Fusch et al., 2018; Newnham et al., 2021; Roberts, 2020). Content saturation strategies included aligning pre impact, archival materials with post impact accounts and investigations. Because of the importance and relative recency of the incident, the catastrophic impact, and the protracted recovery, minimizing bias was paramount to accurately answer each research question objectively. Consequently, reflexive journaling, identified by Ravitch and Carl (2016) as an effective bias detection strategy, was undertaken as an additional method to detect study integrity threats.

**Transferability: External Validity**

Stability threats are universal to all global communities. According to Larson et al. (2020), a catastrophic event can result from incidences of natural or human causes, generating physical or emotional harm or disruptions in societal systems. Therefore, aligned activities between readiness and recovery are globally applicable and transferrable to inform individual, community, and national preparedness plans. Improved data informed readiness strategies at each ecological system level can facilitate whole societal collaboration and recovery. Because disasters can be localized to communities or expand to impact an entire nation, understanding the scalable sufficiency of health and safety policies and procedures is publicly generalizable. This study can help decision makers and individuals evaluate if priorities and expectations, such as health equity and recovery sufficiency, are reflected in the federal disaster management program.

**Dependability**

Resolving trustworthiness issues reflected objective research conduction and analysis. It was imperative to let truths emerge unaltered from the data. Dependability reasonably assures trustworthiness as multi sourced, triangulated data result in replicable and consistent trends (Elo et al., 2014; Patton, 2015). Therefore, this study included an audit trail and reflexive journaling as introspective strategies. The audit trail enabled independent reviewers and researchers to follow the path of the study and independently review data points for objectivity, consistency, conflict, and outliers among the collected data (Creswell & Creswell, 2018; Elo et al., 2014; Newnham et al., 2021; Patton, 2015).

According to Creswell and Creswell (2018) and Patton (2015), determinations that remain consistent when reviewed via intercoder reliability assessments and auditable trails were congruent with qualitative dependability and confirmability standards.

### **Confirmability**

Confirmability is analogous to dependability as these methods support integrity and honesty in the qualitative research findings by similar means. Biases or altered perceptions could have emerged during interviews as disjointed outliers, threatening the study's trustworthiness. However, confirmability provided an added layer of objectivity assurance by aligning data points (P. Fusch et al., 2018). Audit trails and journaling methods also served to reveal correlations or misalignment between conveyed experiences and other sourced data (e.g., procedure manuals and independent investigations) confirming the authenticity of the qualitative data (P. Fusch et al., 2018).

### **Ethical Procedures**

Study participant protections precluded revictimization. Supportive protections included information security, respect, and self determination. The informed consent process for selected participants described the purpose of the study and participation expectations. The process also provided a means to address potential participant questions and concerns. Recruits were vetted for suitability to represent one of the three ecological systems and their capacity to recount events objectively.

The informed consent process assured potential and selected participants of identity protection measures and respectful treatment. Further protections were employed to prevent coercion, criticism, or power dynamics from any source, particularly in

recognition of the seriousness of the incident and ongoing recovery (Leahy, 2021; Shaw et al., 2019). Although the data collection protocol estimated an interview time limit of one hour, expanded discussion time was available for participants to wholly express their feelings. This was in recognition of the Shaw et al. (2019) advisement to extend accommodations for vulnerable populations and ensure they feel fully heard. Additionally, participants were apprised of the right to withdraw at any point from the study without consequence. Information security measures were preserved during the informed consent process and reiterated during the interviews.

Personally identifiable information was neither retained in hardcopy nor on interview transcripts to reduce the risk of information misappropriation. Study participants were assigned alphanumeric identities, noted on a participant list, and stored separately from interview transcripts. The participant list and contact information were stored on a thumb drive. Separately, interview recordings, transcripts, and notes were stored on an internet-disconnected external hard drive. The thumb drive and the external hard drives were further protected with dissimilar passwords and retained within a locked safe in the researcher's home and hard copies destroyed. Redundancy measures to abate risks of data loss entailed storing interview notes on the researcher's sole user Microsoft One Drive until the study was completed, accepted by Walden University, and published, then deleted.

High levels of study participant information security were essential to facilitate full and factual descriptions of activities and outcomes and preclude reprisals for participation. In addition to confidentiality measures, anonymity for macrolevel

participants entailed masking their specific location based operational roles. No unpublished microlevel information was collected. The researcher mitigated software security threats by implementing Microsoft security updates, when released, and running periodic internet and folder security scans. Lastly, impacted individuals, or their representatives, will be contacted if unauthorized access to confidential information occurs.

### **Summary**

This section described strategies for this exploratory case study to comport with qualitative research rigor and facilitate reproducible and expandable research into the federal government's capacity to equitably mitigate catastrophic event impacts. Informed and effective disaster readiness, response, and recovery programs are globally vital because, although specific risks are not universal, the reality of location based risks are. Destabilizing incidences may or may not be foreseeable. Understanding pertinent elements (e.g., threat assessments, resource allocation, mitigation strategies, and intervention outcomes) can inform holistic personal and collaborative disaster management strategies.

The unique insight of individuals involved in the hurricane survivor evacuations can close the knowledge gap between theorized public health policy goals and realized outcomes. The uncompromised first person accounts of individuals involved in the Caribbean evacuation were invaluable to determining the nation's disaster management program's efficacy. Such information can inspire new research, expand the existing literature, and inform abatement strategy revisions by revealing power differentials and

lived experiences during this major multijurisdictional crisis. Identifying correlations and disconnections between the microlevel survivors and macrolevel decision making authorities was facilitated through case study methods, enabling transformative shifts in social expectations.

## Chapter 4: Results

This chapter described the case study research plan to explore the national disaster management program's development and efficacy, as evidenced by reported experiences in the operationalized 2017 evacuation of USVI dialysis patients. Major sections in this chapter detail the data collection and information management process. Structural measures to ensure the quality and sufficiency of information collection are delineated, enabling reliable alignment between policies and results. The sourced data and analysis can ultimately inform local, national, and international disaster decision makers.

### **Pilot Study**

No significant concerns about the interview protocol emerged from the pilot study, described in the preceding chapter, but the trial did inform a priori coding and preinterview state versus federal government instructions (P. Fusch et al., 2018; Milanesi, 2016; Schoch, 2016). The assessment also confirmed that the data collection was limited to the study's scope and interview times were well within the 1 hour planned maximum, precluding participant exhaustion (McGrath et al., 2019). The pilot test was consistent with the methodology plan described in Chapter 3 and compliant with IRB approval (No. 08-18-22-0726218), facilitating a path to the data collection phase.

As previously described, pilot study telephone interviews were conducted with individuals who were socially and experientially comparable to the desired study participants (Harris, 2017). One archetypical pilot study participant per strata was engaged to trial each of the interview instruments and included the following:

- A former federal responder with extensive experience in disaster response represented the desired macrolevel participant. This participant was unaffiliated with disaster response agencies at the time of the interview.
- An individual with knowledge of corporate healthcare policies, procedures, and practices represented the desired mesolevel participant. Additionally, as an African-American familiar with Caribbean culture, this pilot study participant was demographically similar to the majority population of the USVI, as described by the U.S. Census Bureau (Gorowska & Wilson, 2015).
- An individual with medical and mobility challenges and demographics consistent with the evacuees represented the desired microlevel participant (U.S. Census Bureau, 2019a, 2019b).

Exclusion criteria ensured trial participants were uninvolved with any aspect of the USVI hurricane evacuation.

The pilot tested interview instruments, included in Appendix A, extracted the type of information necessary to answer each of the research questions. Sessions lasted 20–40 minutes, including the preinterview verification of participant suitability and postinterview validation of interview responses with the participants. However, clarity regarding state versus federal activities was necessary for discussions with the mesolevel test participant. Because an interview question probed government actions, the respondent did not differentiate between local and federal roles. This confusion was apparent in the response and did not necessitate restructuring the question. Nevertheless, emphasizing the purpose of the study to explore the federal process before initiating the



interview was anticipated to mitigate role confusion. Lastly, the analyzed trial data yielded a list of a priori codes, facilitating the establishment of an initial case structure for data collection.

### **Setting**

Interviews were conducted with selected participant recruitment respondents as described in Chapter 3. Selectees were active and directly engaged in response activities as federal and local government employees. As such, their contributions were integral to data quality and included experiences with meso and microlevel collaborations. In contrast, respondents to the solicitation campaign, who presented as engaged community based responders or evacuees but could not be verified, were not interviewed. To compensate for potential data gaps, publicly recorded statements and interviews by involved and knowledgeable individuals enhanced data robustness and triangulation.

### **Demographics**

The sociocultural demographics of personnel supporting the all-of-government activities varied and the selected study participants identified as Black or White. As such, their ethnicities were not dissimilar to the USVI citizenry, although the selectees did not include personnel with disabilities. Specifically, 76% of the USVI population identified as Black, 17% as Latino, and 15% as White (Bui et al., 2022; CIA, 2021; Gillum, 2018). Demographic records of responders or dialysis evacuees were not ascertainable. Participant Macro A-1 was a federal clinician assigned to a congregant shelter. Participant Macro A-2 was a USVI clinician assigned as a medical escort for the clinically fragile evacuees.

## **Data Collection**

Data collection methods entailed sourcing information from primary, secondary, and tertiary sources. Accounts from experiencers, published descriptions, and other materials such as after action reports, supported case study methods to explore ecological system interactions and outcomes relevant to the research questions. A Google voice phone line was established solely for this study's participant recruitment responses and interviews. Eighteen individuals responded to the social media appeals posted on Reddit, LinkedIn, and Facebook. Snowball referral strategies were unfruitful.

## **Interview Methodology**

Telephone interviews with the 18 respondents were scheduled to occur between September 3 and October 27, 2022. Receipt and review of the informed consent forms were confirmed with the prospective participants before interview initiation. However, only interviews with a USVI government responder (Macro A-2) and a federal government responder (Macro A-1) were completed. The completed telephone recorded interviews lasted 28 and 34 minutes, respectively. Extensive note taking during each interview enabled postinterview recapitulation and reconciliation with each selectee. Incidentally, the Macro A-2 interview recording failed to capture the discussion. The participant submitted a signed interview consent form to compensate for the verbal consent given during the interview, but not retrievable.

## **Document Review Methodology**

Published experiencer accounts, including posts to a USVI hurricane focused Facebook group, media interviews, and congressional testimonies, bridged micro and

mesolevel interview data gaps. The VI Strong Atlanta-Virgin Islands Hurricane Irma & Maria Recovery Coalition (2018) Facebook group contained valuable primary data. This members only social media site was actively engaged in postimpact activities from September 10 through October 12, 2017. Local media publications containing experiential interviews with survivors also provided relevant contextual data. Collectively, these accounts yielded data rich insight into the response efforts from the perspectives of mesolevel response representatives, evacuees, and others. Although some published experiences identified content contributors, pseudonyms were assigned for sources in the following paragraphs to reduce risks of undue psychosocial harm solely for this study. An abbreviated description of roles and identifiers is provided in Appendix B. Described activities and outcomes from the full ecological spectrum of experiencers enabled comparisons between national policies, procedures, and ground level truths.

### **Data Analysis**

Microsoft Excel was used for qualitative data aggregation, processing, and validation. The a priori codes, derived from the pilot study, were subsequently used to segment content by major categorical components in each research question. The coded content, illustrated in Table 1, was then cross referenced with emergent categorical themes, described in Table 2, to identify and extract potentially relevant data. This additional processing measure was taken to probe data concurrence or conflicts. As a result, generalizable data points from holistic preincident disaster readiness to policy aligned recovery procedures and intervention outcomes emerged.

**Table 1***A Priori Codes*

Codes	Descriptions
Preparation	This content encompassed the pre impact to the disaster declaration period
Operations	This content provided insight into the leadership, planning, and coordination of the public-private joint response
Care and services	This content described the facilitation, provision, or omission of essential care or services for evacuees relocated by the government
Reunification	This outcome focused content category extracted key elements in the disaster response continuum impacting reunifications and recovery

**Table 2***Themes and Related Keywords*

Thematic categories	Keywords
Collaboration	Public-private, coordinated, integrated response, interagency
Communications	Inform, communications systems
Data management	Situational awareness, metrics, tracking, assessed, status, data informed
Disability	Special needs
Logistics and safety	Transport, displacement, evacuate, accommodations, sheltering, housing, conveyance
Incident management	Decision making, delegate, task, planning, authority
Policies and procedures	Specifications, requirements, regulations, laws, directives
Need gaps	Provision or deficits in: Social services, case management, disability services, medical care
Rights	Disparities, equity, ADA, civil rights, dignity, bias
Training	Preparation, qualification, competence
Trauma	Harm, decompensation

Analyzing categorical content through the lens of a priori codes improved the trustworthiness of triangulated experiences, interviews, and document reviews, to narrow the focus to relevant data. For example, some concerns repeatedly emerged. This indicated a thematic trend, but study inclusion was limited to the categorical data's quality and relevance to one or more coded research question elements. The exclusion of questionable information aided in minimizing obfuscating data inclusion. Another data validity assurance example involved multiple experiencers raising concerns regarding "chaotic" response environments (*Examining HHS's public health preparedness for and response to the 2017 hurricane season*, 2017; Pokkriyath et al., 2020; Roth et al., 2018). Seemingly discommodious response operations in decimated communities may or may not represent dysfunctional oversight, particularly in the storming phase (Moke & Pfeiffer, 2018). Moreover, descriptors without specifics may not conclusively indicate a lack of cohesion among collaborators or programmatic shortfalls. Consideration of actions and inactions can illustrate policy sufficiency and compliance more conclusively.

Although the processed data revealed consistencies that suggested positive and adverse programmatic features, activities, and outcomes, data analysis involved determining the concerns regarding the objectivity or motivations of content publishers. It is important to note that AARs and federal postincident investigations were negative by design as they sought to identify aberrations or opportunities for improvement. Irrespective of postimpact investigation purposes, the sampled sources and conclusions were described and verified. However, content from socially biased sources or contrary to verified sources was omitted from data analysis. Appraisals, determinations, and

recommendations by special interest groups that contradicted federal laws or abundant scientific research, such as the impact of climate change, were similarly excluded. These focusing measures enhanced the clarity, quality, and relevance of conclusion-informing content.

### **Experiential Data**

The sourced experiences were initially processed by cross referenced a priori codes and thematic category segmentation, described previously in Tables 1 and 2. Subsequently, the experiential data were evaluated for continued code and category relevance to at least one research question. Lastly, the raw experiential data pool was scanned for ecological representation and inclusion. The remaining paragraphs of this section contain discussions of synthesized data, segmented by category. These experiences collectively provided a holistic perspective of the disaster response, informed by decision makers, activity performers, and USVI hurricane survivors.

### ***Preparation***

This code captured experiences specific to readiness for the disaster response. Macro A-2 served as a medical escort during the transport of evacuees between September 9-11, 2017. This study participant was prepared for the assigned role as a licensed clinician and by emergency response training. Similarly, Macro A-1 was a clinician with emergency response training and a member of an HHS specialized interdisciplinary medical team. However, Macro A-1 stated that the response teams, initiated in approximately 2009, were disbanded after the Caribbean hurricanes. Macro

A-1's duties included ensuring the healthcare and services for evacuees in a medical shelter.

As summarized in Chapter 2 and listed in Appendix C, a collection of key documents described the national disaster management program. According to Macro 21a, a USVI health official, the federal strategy was “basically written for states; not written for territories that are surrounded by water.” However, regarding healthcare, Macro 12b described policy supported procedures that ensured equal access to healthcare for survivors irrespective of insurance coverage. According to Macro 12b, HHS partnered with mainland health facilities for insured patients and local governments worked with receiving facilities for uninsured survivors with medical transportation needs.

Although federal programmatic materials and legislation directed accommodations for disabilities, an Office of Civil Rights (2018) report found insufficient preparations for communication modalities and volunteers. According to the federal civil rights agency report, communication methods used during the response were inaccessible for deaf individuals and shelter personnel lacked disability sensitivity training (Office of Civil Rights, 2018). Conversely, upstream ESRD network communications were reportedly planned and operationalized well. Meso 15, a dialysis organizational representative, described the ESRD Network's pre incident readiness for interagency collaboration as successfully bridging the government-to-dialysis center communications for evacuation processes.

## *Operations*

Whether performed or omitted, operational leadership decisions and directed activities reflected pre incident preparation. Despite outages, effective communications were critical to situational awareness and successful strategic planning. Macro A-2 experienced rapid interagency extraction coordination, stating that the provision of air ambulances occurred “within minutes” of requests. Timely support was vital as Macro A-2 stated that transport could only be conducted “little by little” during daylight hours. Also, steady state databases, perhaps most notably HHS’s emPOWER system, were leveraged by multiple entities to obtain dialysis patient data and inform operational decisions. Macro A-2, Macro 13b, and other macrolevel responders accessed the system to locate dialysis patients for evacuation and identify Medicare beneficiaries with durable medical equipment needs (Avilés Mendoza et al., 2021).

Despite the capabilities and successful usage of the emPOWER system to inform actionable strategies, mitigable operational cohesion lapses emerged. Meso 65 raised operational integrity concerns, noting that inconsistencies among the responding federal agencies challenged community based entities’ support efforts. The Deputy ASPR’s stated uncertainty regarding evacuation procedure inclusion in annual training exercises supported operational unity concerns (ASPR, 2018d). Macro 13b also found a lack of operational cohesion after visiting the response efforts in PR. Specifically, operational leadership was unclear. PR officials told Macro 13b that FEMA was in charge, but FEMA stated PR was leading the local effort in PR. Although HHS was responsible for the dialysis evacuees, an HHS representative admitted to infrequent communications with



the Department of Defense, who provided evacuation air transport. During a public discussion of evacuee status, Macro 21a stated that HHS and FEMA oversaw evacuees in stateside facilities. However, Macro 21b countered that FEMA had limited responsibility for medical evacuations. In addition to role ambiguity, PR based responders reported lapses in volunteer credential verification and monitoring (Avilés Mendoza et al., 2021). These upstream macro and mesolevel successes and shortfalls cascaded into downstream evacuee consequences. The following published accounts described the logistical strategy impact on evacuees.

Macro A-2 reported that the initial logistical plans included moving 129 evacuees from PR to locations on the U.S. mainland, but two evacuees made alternate plans. Shimel (2018a, 2018b) described Micro 17's evacuation experiences. Micro 17 was a clinician and a dialysis patient, evacuated from St. Thomas to PR. The evacuee stated she was not included in logistical decisions or kept informed, stating, "I felt so vulnerable ... I didn't know where I was going ... no one in my family knew." As extraction procedures progressed, Micro 17 stated, "They say we going to Puerto Rico ... I don't have my medication, clothes." Similarly, Micro 22, a former USVI official, stated, "patients whisked away in hospital gowns, families unable to accompany them, sent to unfamiliar locations without clothing or belongings."

Micro 17 described securing lodging in a PR hotel housing other USVI evacuees and described potential civil rights and policy violations. After arrival in PR, the evacuee refused a pacemaker placement. Micro 17 was reportedly told, "since you're not going to agree to have the pacemaker put in, I'm going to have to discharge you." After discharge

into the unfamiliar PR environment without information regarding dialysis, food, hydration, transportation, or lodging, Micro 17 learned the location of the other USVI evacuees and secured hotel lodging in the same hotel.

However, Micro 17 reported the evacuees were subsequently evicted from their hotel to accommodate military responders and told to “pack your things, you leave now” to go to a shelter. Because Micro 17 was self funding the hotel stay after being “discharged” by PR clinical responders, the evacuee was told, “We are not responsible for you anymore. You have to find your own way to the dialysis center.” It is worth noting that Avilés Mendoza et al. (2021) documented that “during the time that patients stayed at the hotels,” some “dialysis patients left to stay with family members in other locations” after arrival in PR. Although the PR based responders and Macro A-2 did not name specific evacuees, these experiences, which described the initial evacuation period, may be aligned. Additional undue evacuee hardships were reported after the evacuees were placed in the congregant shelter.

Shimel (2018a, 2018b) continued to chronicle the experiences conveyed by Micro 17. According to the evacuee, the dialysis patients were collected from the PR shelter, taken to dialysis, then directly to the airport. They were “not able to go back to the shelter to get their belongings” before relocation to the U.S. mainland. Micro 17 observed evacuees with “no legs, blind, in wheelchairs, and they didn’t allow family to come with them.” This experience is consistent with Meso 24 and responder experiences. Avilés Mendoza et al. (2021) documented that some NMAs were “restricted” from accompanying evacuees to the U.S. mainland due to capacity limits. Meso 24 was an

NGO staffer assisting with the processing of arriving dialysis evacuees in Georgia. Meso 24 stated that “Some evacuees arrived without identification or medical records. A lot of them came here with no shoes, only the clothes on their backs.” The following Care and Services a priori coded data further described the extraction-to-discharge experiences and operations relative to the health and wellbeing of the USVI dialysis evacuees.

### *Care and Services*

Experiences of knowledgeable and involved individuals, accumulated from interviews and document reviews, yielded robust qualitative data specific to health related, evacuee centered, need identification and gap bridging. According to Macro A-2, initial readiness for USVI extraction was challenged by communication outages as “generators failed.” There were no communications with dialysis centers due to “flood and storm” damage. “We did everything manually to prepare evacuees for transport.” Manual procedures included individual assessments and coordinated abbreviated “short dialysis” with NGOs. Macro A-2 and NMAs accompanied the evacuees, providing nutrition, care, and emotional support until a handoff report was provided to the PR-receiving responders, to preclude health declines. However, Macro 17 reported that after arrival in PR, “they didn’t say anything about dialysis, didn’t have breakfast, lunch, it’s late afternoon. I said; ‘I’m getting dehydrated.’” Although patient identifications were protected and unpublished, Macro 20, who assisted with the PR to U.S. mainland evacuation, stated, “a lot of decompensation took place with patients, especially the elderly.” During a public evacuee status update meeting, Macro 21a, a local health official, stated that “most evacuees are receiving excellent treatment on the mainland.”

Macro A-1's readiness to receive evacuees included provider-to-provider "Forward Observer" communications. The clinician stated that this strategy "likely saved lives." Additionally, Macro A-1 assessed the shelter for disability accommodations. After arrival, the dialysis patients were triaged for holistic needs, including appropriate subsequent placement to ensure continuity of care. Clinical and social support services for patients and NMAs were facilitated through public-private collaborations. Lifestyle and dignity supports were also accommodated. Macro A-1 described negotiated agreements between patients, clinicians, and NGOs for USVI-styled cuisine. FB1-1's experiences aligned with Macro A-1's described provision of cultural meals for evacuees in Atlanta and Miami. These agreements resulted from bargains, including prescribed diet modifications, patient compliance, and community based meal arrangements. Macro A-1 described further evacuee focused, stabilizing essential care and services secured through macro-meso collaborations. The shelter personnel worked with public and private partners to replace durable medical equipment and policy flexibilities to facilitate the early opening of new dialysis centers to accommodate evacuee needs. Despite these noteworthy successes, Macro 18 noted policy omissions related to NMA needs.

Macro 18, an ASPR representative, stated, "We learned from this response that it wasn't just the dialysis patients who needed wraparound care; services needed to be provided to their nonmedical attendants who evacuated with the patient." Specifically, the responder noted daily needs for the displaced persons were inaccessible, stating "there was a gap in providing basic life services support such as meals, shelter, and transportation. We quickly developed requirements and implemented the necessary

support contracts.” Meso FB1-10 noted other operational shortfalls related to health and wellbeing in an October 2017 appeal for social service volunteers in Atlanta. However, despite inclusion in procedural documents, these shortfalls were unmitigated. The Virgin Islander, volunteering to assist Atlanta arrivals, stated, “It’s unfortunate that our patients have no social workers assigned to them in their time of crisis.” In a subsequent March 2018 testimony, Macro 12c, an ASPR representative, stated that three USVI nurses were assisting with case management, two of the three were in St. Croix. Social services and Case Management are vital to bridge encapsulated support functions and facilitate reunification and community reintegration.

### ***Reunification***

Disagreements regarding macrolevel responsibility for displaced medical evacuees complicated family reunification and jeopardized community reentry. In one exchange, the USVI health official, Macro 21a, stated, “HHS and FEMA were to manage the medical treatment and track evacuees in stateside facilities.” However, Macro 21b responded that FEMA responsibilities were “limited in medical evacuations; the USVI and HHS were responsible for medical evacuees, including movement, reporting, and ADL assistive personnel.”

The conveyed experiences, extracted from social media posts, depicted public appeals by NGOs and community members to locate displaced evacuees. In a September 2017 social media post, Micro FB1-3 advised, “If individuals are looking for their family members who were evacuated from the Virgin Islands to FIU...they can call the police station.” Approximately 2 weeks later, Micro FB1-8 posted, “we are trying to locate

dialysis patients that were transplanted to Atlanta from Miami for medical attention.”

Macro 12, a USVI legislator, proposed maintaining a “chain of custody on each patient, including names of the accompanying family member, and an additional emergency contact” to ameliorate accountability lapses.

The a priori codes and categories were well represented in the conveyed experiential data. But because the experiences were limited to the data source’s perspectives, locations, roles, and engagement periods during the more than 10 months of the response, data were not presented for each category per research question. Nevertheless, in conjunction with the programmatic expectations summarized in Chapter 2, the thematic categorical content was sufficiently represented in the sourced experiences to address one or more research questions as written.

### **Trustworthiness**

Careful measures to ensure data collection, aggregation, and analysis provided reasonable degrees of confidence that data management was consistent with qualitative research standards. Trustworthiness assurance methods also provided an audit trail and supported interrater reliability, facilitating subsequent research (Creswell & Creswell, 2018; Elo et al., 2014; P. Fusch et al., 2018). The methods plan described in Chapter 3, and expounded on below, aligned with study goals. The employed methods ensured the research questions were answered in meaningful and unbiased ways.

### **Credibility**

Information compiled from knowledgeable or influential macro, meso, and microlevel sources, was limited to the phased USVI dialysis patient evacuation. The data

pool included content from documents that directed response decisions and experiential accounts. Information from authoritative, knowledgeable, or involved sources, such as national programmatic materials, personal accounts, AARs, White Papers, and research, supported maximum data extraction and information saturation. Material saturation was satisfied as categorical content redundancies were apparent, and no new information emerged in sufficient detail or description to alter previously collected data.

As accumulated, the extracted information sufficiently addressed each research question relative to each ecological system grouping. Reflexive journaling was performed following IRB approval to monitor for researcher bias, further preserving the integrity of the data. Published accounts from meso and microlevel experiencers filled data gaps resulting from unverifiable respondents.

### **Transferability**

The interjurisdictional response was an unprecedented testing of the national disaster management program. As such, the results were applicable to inform the actionability and sufficiency of emergency response plans for other geographies with vulnerable populations. Generalizability of the study outcome was satisfied by ecological system representation. Microlevel territory based dialysis patients represented SDH compromised individuals in hazard zones. Furthermore, policies and activities relative to the meso and macrolevel disaster response, coupled with societal socioeconomic and equity implications, are extractable to other geographies as climate change impacts worsen (Shultz et al., 2019; Zomorodi, 2020).

**Dependability**

The revealed institutional and human level realities that emerged as congruent content, or themes, were cross referenced with a priori codes for intersecting reliability verification. No two catastrophic incidences or responses are identical, and experiences vary. Nevertheless, data informing this study are replicable and relevant. The aggregated data included individuals at risk for poor outcomes and those entrusted with evacuee care and safety.

**Confirmability**

Methods to preserve confirmability and objectivity included recognizing the function, roles, and expectations that informed and influenced the sourced materials. Programmatic materials were intended to inform and direct the response and included interagency priorities, expectations, and authorities. This study's central focus was identifying alignment or incongruencies between programmatic specifications and survivor outcomes. Some data point misalignments related to the protracted response period extended over multiple locations and reporters.

Additionally, ambiguous or omitted dates of reported information in published accounts may have contributed to seemingly conflicting information. For example, conflicting reports regarding renal diet provision may reflect actions at different locations or different periods. Nevertheless, sourced data was sufficient to support or refute policy sufficiency, compliance, or survivor revictimization. The effectuated methodology remained consistent, as described in Chapter 3, with bias mitigation and privacy protection measures taken to preserve the integrity of the study. The subsequent section



of this chapter described the study's research question-specific findings, based on the national disaster response program expectations and the operationalized 2017 hurricane response.

## **Results**

Data aggregation was holistically sufficient to address the research questions and to inform future research. As designed, the ecological framework situated the varied perspectives of informed and involved individuals, extending from the initial extraction to the recovery phase, into the case study framework. Key documents, summarized in Chapter 2 and listed in the appendices, described the disaster management programs' directives and expectations for federally declared and coordinated disaster responses. The subsequent presentation of the study findings are delineated by research question.

### **Research Question 1**

How did the national disaster management policies and procedures mitigate the impact of the 2017 Hurricanes Irma and Maria on the United States Virgin Island's vulnerable dialysis population?

Document reviews, supported by conveyed experiences, provided insight into the alignment between policy sufficiency and success. Specifically, this query explored how the national response program improved the evacuees' post impact status. One noteworthy success included the directed preparation of subject matter experts and public-private partnering. Macro A-1 and A-2 received emergency response training in addition to clinical preparation. This pre impact preparation enabled rapid action to anticipate and mitigate needs, such as abbreviated preflight dialysis treatment to preclude

decompensation during extended travel. This enhanced competency and collaboration readiness was consistent with the Post-Katrina Emergency Reform Act (2006), summarized in Chapter 2.

The legislation, informed by lessons learned, also directed strategic planning for large scale evacuations to consider transportation for individuals with special healthcare needs. Transportation readiness included interagency arrangements for accessible transport equipment and dialysis patient preparation, in compliance with the NRF and the Response FIOP directives. The national disaster management program allowed one NMA to accompany evacuees with special needs (DHS, 2016a; *Examining HHS's public health preparedness for and response to the 2017 hurricane season*, 2017). According to Macro A-2 and Macro 13b, the evacuation of attendants to assist with the ADL and emotional needs of the evacuee was an added value for the displaced patients.

As noted earlier, the extensive needs of the prolonged engagement resulted in the full activation of the disaster response program and risked responder fatigue. Consequently, the Emergency Management Assistance Compact agreement was activated. Because the compact respondents could request cost reimbursement from the federal government, regional jurisdictions assisted in the response and recovery without fiscal jeopardy (DHS, 2016a, 2016b; FEMA, 2021c; Stripling et al., 2018).

The pre incident emergency preparedness enabled the federal-state-NGO ESRD Network to continue response efforts despite the health and communications infrastructure collapse. Meso 65 described the operationalized communications strategies employed by the network, as bridging the gap between dialysis patients and federal

decision makers. This fostered informed strategy development for rescue and impact abatement. Additionally, the quality of evacuee specific information available to the network during Hurricane Irma, such as the number of hemodialysis patients in the USVI, was valuable, verifiable, and actionable. As individuals with disabling conditions, the Response FIOP, NRF, and the Division of Civil Rights emphasized the preserved requirements to comply with disability and equity stipulations despite disaster conditions (DHS, 2016a, 2016b; Division of Civil Rights, 2020). Compliance was vital to preclude revictimization during the 1000 mile transport to definitive care and safety. The effectuated readiness to rescue in the federal policies and procedures enabled the vulnerable survivors to access life-sustaining dialysis services.

### **Research Question 2**

What procedures ensured, or failed to ensure, evacuees were provided with dignified, individualized care and services to support equitable access to daily living necessities while in the custody of the federal government?

The previously discussed research question was limited to successfully implemented policies and procedures. However, this research question pondered evacuee focused quality outcomes. Interviews and document reviews revealed circumstances of favorable and unfavorable patient outcomes attributable to response activities. Evacuee and intervention outcomes are subsequently summarized.

The prolonged conveyance of health compromised individuals from island territories was historically unprecedented and not addressed in the national policies and procedures. Macro 21a, a USVI health official with extensive federal professional

experience, confirmed that the national disaster response strategy excluded the unique challenges of island territories. Despite this omission, the Disaster Relief Act (1974) confirmed that U.S. territories held state status. As such, the legislation confirmed equity expectations. Moreover, the NRF and Response FIOP documents were scalable to inform mitigation strategies. Experiential and document data included examples of employed or omitted procedures that enhanced or impeded individual rights and needs gaps between extraction and discharge.

Micro 17 was among the first group evacuated from St. Thomas to San Juan, beginning approximately September 9, 2017. According to Macro A-2, activities included preflight dialysis, accompanying NMAs, and medical escorts to support the evacuees. Reportedly, no health declines arose during the relatively brief USVI to PR conveyance, but some evacuees experienced emotional distress. These successfully implemented strategies were consistent with the Response FIOP and ASPR's Patient Movement task descriptions. However, Macro A-2 and Micro 17's accounts of communications differed. Communication lapses resulted in patient movement without vital preparation such as insurance cards, identification, clothing, or funds. This was confirmed by receiving responders on the U.S. mainland and enhanced evacuee's dependence on the government. As such, the strategy was inconsistently implemented and compromised evacuee wellbeing and self determination.

Evacuee rights to self determination and evacuee focused strategies were not evident in Micro 17's experiences after arriving in PR. The evacuee alleged retaliation for asserting medical self determination and eviction from lodging to accommodate

responders. Although the rationale was unclear from official sources, accounts from Micro 17 and PR responders, during the same timeframe, described the movement of evacuees from their hotel lodging to congregant shelters (Avilés Mendoza et al., 2021). As described by the evacuee, this destabilization of the fatigued evacuees was emotionally disturbing. It also likely contrasted with programmatic planning specifications. The Response FIOP directed advanced planning for responder food and lodging needs. Advanced planning was critical but repeatedly underperformed during the 2017 hurricane season. Concerns that responders occupied lodgings, displacing survivors, across the disaster responses in Texas and the Caribbean were raised (NCD, 2019; *The Historic 2017 Hurricane Season Impacts on the U.S. Virgin Islands: Hearing before the U.S. House of Representatives Subcommittee on the Interior, Energy, and Environment of the Committee on Oversight and Government Reform*, 2018).

Macro 20, whose role included assisting with the transport of evacuees from PR to the U.S. mainland, described “a lot” of interim health declines among the evacuees. The interview with the responder did not address mitigation measures or decline avoidability. Macro A-2 reportedly provided hydration and nutrition during travel. This may differ from Micro 17’s experiences, as the evacuee described becoming dehydrated after receiving no hydration for an extended period.

The airport transfer of care and custody to PR based responders included extensive needs assessments and screenings, consistent with the described responsibilities in the Response FIOP and ASPR’s Patient Movement materials linked in Appendix C. During which, the daytime temperature at the San Juan Airport between 7 a.m. and 7 p.m.

averaged 84 degrees Fahrenheit, with 76% humidity (CustomWeather, 2023; Weather Spark, n.d.). Considering the lengthy period of transfer of custody assessment, the chronic health condition of the renal failure patients, and environmental factors, evacuee centered activities were insufficient to prevent adverse outcomes.

Strategies described by Macro A-1 were consistent with programmatic directives and expectations. The high quality communications and pre incident preparation, described by the responder, enabled the U.S. mainland shelter staff to ensure the arrivals received individualized medical and social services. Interagency arrangements facilitated equal access to care and services without regard to insurance coverage, such as medical device replacement and ADL assistance. Additionally, cultural meal arrangements enhanced the dignity of survivors separated from their communities.

Despite these successfully leveraged programmatic flexibilities and needs accommodations, actualized ADL assistance was unassured for each evacuee. Contrary to congressional testimonies by FEMA and ASPR representatives, PR based responders confirmed that some NMAs were not allowed to evacuate to the mainland with the patients. The absence of NMAs to advocate for and assist evacuees increased their vulnerability. Also, social services insufficiencies in addressing patient needs furthered health, safety, and revictimization risks.

### **Research Question 3**

How did federal response procedures facilitate multi agency cohesion, promoting a safe extraction to reintegration continuum for evacuees?

Unparalleled full ecological extraction to reentry operations were necessary to meet the unparalleled impact and mitigation challenges. Many of the Emergency Support Function (ESF) component capabilities, summarized in Appendix B, were activated to support the continuum of evacuee focused rescue and recovery operations. For example, search and rescue, physical safety, and food safety roles were leveraged but perhaps underrepresented in publications compared to public health and logistics. The full ESF activation was vital to unite public-private expertise under FEMA leadership and facilitate quality care in custody. However, macrolevel role confusion and quality lapses in evacuee centered procedures throughout the operational continuum persisted.

High quality information and communication were integral to all programmatic directives. Although limited to Medicare beneficiaries, the patient location capabilities in the emPOWER system were instrumental in informing the transport of evacuees to dialysis centers for extraction. This information source excluded dialysis patients who were private pay, uninsured, or tourists, necessitating additional information sourcing. Also, microlevel evacuees were excluded from logistics and planning communications. As such, they were ill prepared for the extended travel. Meso 24 described interagency operations as “disjointed” and observed evacuees arriving insufficiently clothed for the environmental conditions. The vital role of disaster social services, or case management, was designed to bridge such interagency breaches throughout operations, including advocating for and mitigating evacuee needs gaps (DHS, 2016c; FEMA, 2019). Although locations and dates of social service personnel deployment throughout the continuum

were unspecified, the data supported determinations that social support quality was inadequate to meet evacuee needs.

In addition to protection from environmental elements, the physical safety of the evacuees was unassured, as some were reportedly missing after extraction. Social media posts by FB1-3 and FB1-8 described ongoing searches for evacuees weeks after extraction. Mesolevel confidential informants also reported lapses in the interagency transfer of evacuee custody to the NCD (2019), stating that accountability for shipped packages was more precise than that of disabled disaster survivors. Breached continuum of custody disrupted reunifications, as directed by the Post-Katrina Emergency Reform Act (2006) and distilled in the NRF and Response FIOP. Although the Response FIOP specified procedures for family notification, Macro 12a's advocacy for collecting family member contact information suggested insufficient implementation of family reunification procedures. Consequently, ASPR dispatched teams in PR to search for missing evacuees (GAO, 2019d). USVI families also searched for evacuees in PR and the U.S. mainland. Conversely, without specifics and before dialysis services resumed on the islands, Macro 12a stated that "most" declined to return to their communities.

The formative NPS and Presidential Directive #8 goals intended to ensure whole-of-society responses functioned as a cohesive unit (FEMA, 2011; Obama, 2011). Derivative materials and updates furthered this goal, informed by research, data, and subsequent incidences. Despite the availability of lessons learned and programmatic specifications for cohesive public-private response and recovery operations, resultant pre incident and ongoing collaboration were unevidenced in the Caribbean response (DHS,



2016a, 2016c; GAO, 2019c). In fact, Macro 65, an ASPR representative, testified of pre impact programmatic shortfalls that complicated operational cohesion, stating, “We have not engaged in trusted relationships that will help us work through the complex problems associated with response and recovery.”

### **Summary**

The three posited research questions spanned the totality of the response, from pre impact to the recovery phase. As framed, the queries sought to identify successes and opportunities for improvement. Despite the absence of consideration for NMA’s needs after displacement, the national system for disaster management provided a structure for the scalable whole society response. The rapid mobilization of assets to effectively relocate hemodialysis patients after the destruction of the local healthcare delivery system preserved the lives of the evacuees. Because the island’s transportation infrastructure was incapacitated and the PR could not absorb the dialysis treatment needs, self evacuation from the USVI to safety was not feasible.

Infrastructure damage, including banking and transportation, nullified individual capability to arrange off island transportation. Nevertheless, instances of socioeconomic disparities followed extraction. In comparing federal policies to response actions, the examples of rights violations presented in the data contrasted with programmatic directives for equity and survivor focused activities. Whereas holistic lapses in oversight and advocacy were unmitigated in the absence of disaster case management, responder self directed activities met some survivors’ projected or actualized needs. Macro and mesolevel responders acted to obtain essential services and clothing for the evacuees and

NMAs, albeit after they were adversely impacted. Additionally, responders worked jointly on dignity-enhancing strategies to ease the displaced evacuee's emotional trauma, as community reentry was unclear.

The ESF structure and delineated core competencies facilitated the absorption of mesolevel entities into response operations. The complete local infrastructure devastation translated to the need for upscaled, whole society engagement, including unincorporated individuals. Instances of individual engagements were noteworthy. For example, Micro 17 described preflight advocacy by USVI based clergy and PR based security personnel. Similarly, Facebook posts illustrated survivor-to-survivor support from community members, striving to meet vital needs gaps, such as clothing and family reunifications. Programmatic directives included specifications for evacuees' safe conveyance and accountability as an anticipated need. However, the prolonged span of engagement was unprecedented and unpredicted in the written procedures. Inconsistent adherence to specifications designed to ensure evacuee safety was evident, particularly during the early evacuation phases. As such, neither safety nor community reentry was assured for all dialysis evacuees. The concluding chapter presents the summarized study and its implications.

## Chapter 5: Discussion, Conclusions, and Recommendations

This case study explored the United States' disaster management program's adequacy to effectively coordinate hurricane response activities, averting adverse outcomes for evacuees with compounded SDH challenges. Although the impact and response to the sequential Caribbean hurricanes in 2017 were unprecedented, threat surveillance warned of possible climate change driven recurrence in one or more of the nation's seven geographically isolated coastal areas. Such added risks enhanced the criticality of informed mitigation strategies. To that end, exploring the national response provided an opportunity to evaluate the national strategy's surge capacity, programmatic tensile limits, and quality impacts. Recognizing stability threats and understanding successful mitigation strategies inform incident actionable readiness, response, and recovery at each socioecological level. This study's salient findings are subsequently summarized.

Programmatic successes prepared meso and microsystem level individuals and entities for integration into lifesaving, government led operations. The value of the publicly available programmatic components and framing materials (e.g., informative precedents, regulations, legislation, and executive directives) cannot be understated, as these facilitate local and federal alignment. Although hurricane risks are not universal, natural or human generated disaster threats exist for all geographic locations. Consequently, network collaborations emerged as a consistently successful strategy. Despite the widespread local infrastructure collapse, risk recognition and steady state collaboration enabled the ESRD Network to effectively support the dialysis patient care

and evacuation strategy. Another programmatic design success included planned social support for disaster survivors. This survivor centered function could avert or bridge survivor need gaps.

Despite the programmatic social support specifications in the interagency operations plan, evacuees experienced avertable gaps in daily living care and integrated essential services. In addition to social services lapses, the integrity of the joint effort as a unified response was inconsistently maintained. Discontinuity increased survivor wellbeing risks. Moreover, the evacuee's physical health and safety threats were compounded by emotional harm as operational convenience may have taken precedence over evacuee accountability, needs, and rights. Inadequate responder supervision to ensure intervention quality and policy compliance, coupled with othering by public officials, diminished the evacuees' human dignity, thereby revictimizing the survivors. Insufficient preparation for extraction solidified the subordination of the USVI survivors, inhibiting their self determination capacity. Fully operational and integrated disaster case management could have been instrumental to interagency congruence and evacuee centered strategies.

### **Interpretation of Findings**

Evidentiary support for the study conclusions was derived from interviews and document reviews. The summarized study conclusions were discussed in conjunction with the aligned research questions. The aggregated qualitative data identified programmatic and operational successes and deficits, but the outcome narratives were limited to the research questions as written. Collectively, the study outcomes included

findings to substantiate the national disaster management program, identify opportunities for improvement, bolster the body of literature, and support subsequent research.

### **Programmatic Mitigation Capacity**

Despite the catastrophic assault on the United States' Caribbean territories, the national disaster program preserved lives and livelihoods. The comprehensive, scalable, and publicly available disaster management materials enabled potential participating agencies, officials, and individuals to prepare for engagement before disrupting incident occurrences. The federal program, designed to preclude avoidable harm to incident survivors, reflected research and lessons learned from prior incidences, statutes, laws, and regulations. The program clearly described unwaivable civil rights provisions. Federal laws preserved evacuee's rights to self determination, dignity, equity, and freedom from unnecessary institutionalization or retaliation for exercising their rights. In addition to retaining civil and disability rights, health equity assurances were operationalized during the Caribbean response to ensure uninsured patients could access care.

The 2016 revision of the Response FIOP and NRF included operationalized policy and procedural changes informed, in part, by lessons learned since Hurricane Katrina. The all-of-government activation leveraged agency resources such as HHS's Medicare data systems. The emPOWER data system improved decisional situational awareness, supplying vital patient level information to inform strategy development and responder-to-responder communications. Multiple federal and local entities noted the value of this information repository throughout the incident response phases.

The rapid action to mount a holistically novel disaster response, emphasizing the early rescue of the dialysis patients, was consistent with the spirit and intent of the national policy priorities. The recognized enhanced vulnerability of the clinically, socially, and geographically isolated population subset triggered the activation of ESF 8 to lead the holistic coordination of activities for the USVI hemodialysis patients. This strategy was lifesaving. Patient centered activities began before extraction, including abbreviated preflight dialysis treatments and assigning clinical flight escorts.

In addition to the rapid evacuation, one of the federal program's most person centered leveraged mitigation tools was the NMA strategy. Allowing individuals, such as a family member, to accompany evacuees until reentry or discharge provided a substantial means to alleviate emotional and physical stressors. As the evacuee pool included individuals with physical and cognitive disabilities, the accompanying NMAs were a vital force multiplier to reduce incidence of unmet ADL assistance needs. Informed readiness, effective collaboration, and interecological system oversight bolster response outcome quality.

### **Dignified and Equitable Custodial Care and Services**

FEMA was uniquely positioned and authorized to direct the interjurisdictional state-territorial operations because it was the nation's designated disaster management entity. However, there were operational successes and counterproductive outcomes. Outcomes reflected programmatic deviations and validated strategies. The ensuing paragraphs contain examples of high consequence programmatic gaps and conformity that impacted the evacuees in the care and custody of the government.

Disaster case management, or the provision of social services, was a vital component, interwoven throughout each phase of readiness, response, and recovery materials. Strategies and expectations for survivor support, such as social workers as part of interdisciplinary disaster response teams and the Disaster Case Management Program, were programmatically formalized. Social support functions included individualized, evacuee centered oversight, bridging needs gaps. Linking microlevel survivors with macro and mesolevel support and information exchanges positioned evacuees for better outcomes and facilitated recovery readiness.

However, in the absence of strategically deployed social support personnel, other responders and volunteers assumed social work tasks. The literature and interviews signaled that insufficient positioning of qualified social support personnel in key locations and adequate numbers contributed to unmitigated, predictable needs gaps. As such, the evacuees needlessly experienced indignities and increased vulnerabilities. During a March 2018 congressional testimony, ASPR testified that three nurses were functioning as social workers (*The historic 2017 hurricane season impacts on the U.S. Virgin Islands*, 2018). However, the testimony did not specify when the nurses were assigned the tasks, their qualifications to fulfill the role, or efficacy outcomes. Public appeals for social support in Atlanta and other documents suggested that unmitigated needs gaps persisted. Social support lapses included evacuee exclusion from communications, transportation to essential public amenities, rights violations, and reports of lost evacuees or “discharged” without community reentry strategies. Federal disaster management materials described expectations and methods to reasonably ensure

the evacuees received appropriate social support while in the care and custody of the government. However, avoidable lapses, resulting in unmet essential survivor needs, indicate strategic plans failed to maintain evacuee focused care and services.

### **Operational Cohesion and Safe Extraction to Reentry**

Operational singularity was critical yet discontinuous throughout the response phase. As discussed in the Literature Review, disaster management materials highlighted the importance of unified response efforts following major stability disruptions. Despite the scalability of disaster management and survivor focused goals, the magnitude of the response challenged the operational span of control. Consequently, interagency cohesion under the defined chains of authority was compromised. This undesired outcome was evidenced, in part, by incidents of ambiguous or exceeded decision making capacity and role confusion. Experiencers described avertable risks to evacuee safety, disparities, and policy deviations between community extraction and reentry readiness, attributable to interoperational shortfalls and inconsistencies.

Poor quality communications and cohesion lapses among the macro and mesolevel response entities risked the safety and wellbeing of the underinformed evacuees. The exclusion of all involved participants before extraction was a significant omission, inhibiting interagency planning and increasing evacuee vulnerability. Hurricane alerts forewarned of impending impact (Cangialosi et al., 2018; Pasch et al., 2019; Pokkriyarth et al., 2020; Shimel, 2018a). As such, communicated contingent strategies could have been conveyed before critical infrastructure collapses but perhaps insufficiently noted as an option in programmatic readiness preparation. This is suggested



because the Deputy ASPR was uncertain whether evacuation planning was included in readiness exercises (ASPR, 2018d). The value of surveillance, supervision, and high quality information exchange to maintain connections among disconnected partners was critical, promoting operational success. However, experiencers from each ecological level described detrimental and preventable breaches in the extraction–reentry continuum. These recurrent lapses occurred despite the vast experience of involved federal decision makers. Poor quality communication exchanges and oversight inhibited operational singularity over the various interim locations.

Experiencers in PR, a key transfer location between the USVI and the U.S. mainland, described lapses in responder oversight and departures from disaster management procedures. Operational shortfalls included insufficient evacuee movement tracing, participant credential verification, and activity monitoring. Consequently, unauthorized local responders “discharged” evacuees from the operational continuum, and evacuees experienced civil and disability rights violations. Inconsistencies in tracking evacuee movement inhibited the ability to discern the scale of continuum interruptions. Whereas multiple transfers were necessary, monitoring was also necessary. However, USVI and federal decision making authorities differed on monitoring responsibilities. In addition to role confusion, decision maker unavailability challenged interoperability. A GAO (2019d) investigation concluded that ASPR had a “limited presence in the U.S. Virgin Islands.” As the principal HHS designee for all medical evacuee related activities, the agency linked public health macro and mesolevel partners into the unified strategy.

The unprecedented activation of all federal components rendered the national program's specifications and expectations for collaborative extraction to reentry actionable. Specifically, the deployment of multiagency, specialized, interdisciplinary disaster responders and the ESRD consortium were integral to the safety of the hemodialysis evacuees. The engagement of experienced subject matter experts reduced on site storming phases of aggregated interagency personnel. This lag time reduction increased the speed and quality of evacuee focused interventions. For example, support for displaced NMAs was recognized and provided by experienced personnel despite the absence of policies, procedures, and trained disaster social workers. This enabled the NMAs to continue providing ADL, advocacy, and emotional support for the health compromised evacuees.

Additionally, the ESRD Network's preparedness, described earlier in this document, enabled response activities to proceed, despite telecommunications outages. Federal, territorial, and dialysis service providers were prepared for emergency operations and acted accordingly. Implemented strategies, such as abbreviated preflight dialysis, reduced adverse outcomes from reasonably anticipated treatment schedule interruptions. The ESRD consortium members were aware of component partner roles and continued to support the dialysis response strategy despite intermittent engagement in overall operations.

Although the federal disaster management program provided a holistic interagency framework, the 2017 Caribbean response did not evidence operational unity. As such, the safe extraction to reentry for each territorial dialysis evacuee was unassured.

Collectively these findings provided an understanding of the human level impact of holistic preparedness, extending from pre impact preparation to response and recovery readiness. Improved readiness at each ecological level is warranted.

### **Limitations of the Study**

Inaccessible informative data from each ecological system required research design adjustments. As such, the quality of the findings was somewhat inhibited. The absence of suitable meso and microlevel participants limited the integration of unpublished, primary perspectives and experiences into the study. Despite the extended and varied participant solicitation campaigns to include informed and involved interviewees in the study, vetting measures only found suitable macrolevel respondents. The reduced number of hemodialysis evacuees and community based responders agreeing to participate in the study may be attributable to incident fatigue or fear of retaliation. Additionally, the absence of dialysis patient respondents may be related to continued displacement, clinical compromise, or demise. As discussed in Chapter 4, the study design adjustments were necessary because respondents claimed to have been community based responders or evacuees but had little or no knowledge of the response efforts or the USVI. Therefore, potential scammers were ruled out and published meso and microlevel accounts were used to support data robustness and trustworthiness.

Another limitation involved publication availability and transparency. Some government websites, sourced to inform Chapter 2, later underwent changes or deactivation. I submitted Freedom of Information Act requests to HHS and the Census Bureau to obtain changed or deleted information. Although I had previously viewed

specific USVI demographic information, I had not taken screenshots nor were any demographics provided in response to the official request. A decisional appeal was not submitted. This information was sought to reconcile disparities in data reported from official sources, such as the number of USVI residents at the time of Hurricane Irma and other sociodemographic data.

The USVI's disaster management program that was in effect during the 2017 hurricanes was also subsequently taken offline. I submitted a request for an archived copy from VITEMA, but none was provided. However, relevant components of the emergency operations plan were retained before the document's removal and replacement. Significantly, the emergency management plan noted that the more than 2 million annual visitors increased the at-risk population. Despite this valuable information, the plan lacked significant logistical contingencies, such as alternative transportation strategies for impassible roadways, irrespective of the island's numerous rural and mountainous areas. It was unclear whether FEMA evaluated and approved VITEMA's plan before 2017 or if informative metrics such as population numbers were accurate, as the local emergency operations plan referenced 7-year-old data. Altogether, limited experiential participation, inaccessible real time disaster management metrics, and information that could have influenced strategic planning necessitated research design adjustments.

### **Recommendations**

This study provided a baseline for further reviews and bolstered evidence based disaster readiness and response literature. Comprehensive research into the role and usage of disaster social services personnel is warranted. As evidenced by this study, integrating

appropriately prepared and qualified disaster case management is vital at each phase of major incident management.

Systems theory may expose causal factors for disconnections between policy, practices, and interagency response disunity. Further studies may center on social services or Disaster Case Management efficacy as an intersystem bridge. Both the Response and Recovery FIOPs noted specific survivor social support expectations, and the Recovery FIOP formalized the Disability Integration Advisor function before Hurricane Irma (DHS, 2016c). Although it seemed logical that integration advisors would include planned advocacy for individuals with physical, emotional, or psychological impairments, the description of expectations for the Disability Advisor was unspecified in the document (DHS, 2016c). Definitive research may reduce incident-to-incident task relearning or ineffective strategy implementation as new disasters occur, inhibiting efficacy variances (Kirschenbaum, 2019). For example, the GAO (2019) found that FEMA's plan for Disability Advisors to subsequently canvass USVI communities to identify disabled individuals with unmet needs was unsuccessful. Because the role of the Disability Integration Advisors was without specific tasks or quality indicators, response to recovery transition gaps may have remained unbridged. Theory supported studies can edify program component authors and provide a basis to guide outcome oriented revisions.

Researchers could source the Caribbean response to inform steady state readiness for unified large scale interagency mobilization. Because crowd social behaviors influences differ in comparison with intimate groupings, Turner and Killian's (1987)

Emergent Norm Theory may provide a fundamental understanding of crowd socialization and influence. This can guide conformity enhancing strategy development and reduce divergence from operational procedures and survivor revictimization. Emergent Norm Theory may provide insight into how evacuee othering, albeit possibly unacknowledged and inadvertent, emerged among ground level responders and at least one elected official (Shimel, 2018b). Understanding group thinking can inform effective monitoring and improve survivor focused joint efforts. Although macrolevel interviewees reportedly received emergency response training and credentialing, the literature described preparation and oversight inconsistencies among responders.

Lastly, additional studies to probe the plight of displaced survivors, including NMAs, are recommended. Case studies or phenomenology studies centered on families of displaced evacuees or responders participating in the evacuation continuum can meaningfully improve procedures. According to an HHS Freedom of Information Act response, there were 807 medical evacuees. Medical evacuees were reportedly “repatriated” to two states, PR, and a foreign nation following Hurricane Maria (HHS Assistant Secretary for Public Affairs, 2020). Because evacuee tracking was problematic, the experiences and plight of each medical evacuee was unclear. Additional research should also explore the quality and safety of evacuees under the care of NMAs. This study revealed that displaced NMAs lacked life support necessities, such as access to banking and laundering. Increased duress on assistants may translate to safety risks for evacuees. Further research can enable disaster management policy and procedure

revisions to identify continuity and operational gaps, helping individuals at high risk to prepare for possible prolonged displacement and protracted recovery.

### **Implications**

The reviewed literature did not indicate a lessening risk of destabilizing incidences. Therefore, individuals, supporters, and authorities should capitalize on revealed readiness and response improvement opportunities at each ecological system level, averting recovery quality compromise. However, understanding causation is critical to positive, meaningful change. As noted in the previous chapter, consequences of performed, underperformed, or omitted interventions, whether intended or inadvertent, impacted cohesion and jeopardized survivor safety. As such, poor quality preparedness increases adverse outcome risks, resulting in diminished resilience and faith in response and support institutions.

### **Macrolevel Implications**

Whether federal or local, macrolevel entities maintain duty to respond and culpability hierarchies for some outcomes following catastrophic events. Accordingly, the national disaster management structure and operational materials support incident based strategies, reflecting legal protections and social obligations. These public-facing documents were available to inform meso and microlevel self preparedness but some social support functions were underdeveloped. Moreover, findings from this study indicated that compliance with directed preincident public-private collaboration and training were insufficient. Macro and mesolevel collaborative and performance quality shortfalls were noteworthy but rectifiable.

Improved holistic communications, training, and exercises, including community gatekeepers, can only improve unified survivor focused efforts. Such improvements address cohesion risks and integrated mission capability hindrances (e.g., the ESF structure) understanding decision making authorities, and constraints. Collaborative partnerships are reminiscent of Presidential Directive #8, which recognized incident preparedness as a full ecological system responsibility (FEMA, 2011; Frykmer, 2020; Obama, 2011). Collectively, expectations and surveillance data (e.g., population health or safety threats, fiscal shortfalls, civil and disability rights) derived from effective partnering frame actionable joint disaster planning and management. Holistic cognizance and conformity with programmatic components are necessary to avert undue evacuee harm from absences of adherence, monitoring, enforcement, or sustained corrective actions.

***Positive Social Change Implications: Macrolevel***

In addition to disability rights concerns, social disparities and disparagements of hurricane survivors, some briefly discussed in Chapter 2, recurred in the Caribbean response (Chua et al., 2007; Division of Civil Rights, 2020; NCD, 2019). For example, despite being U.S. citizens, the governor of PR referred to the evacuees as “refugees” and an HHS Public Affairs staffer referred to their relocation to other U.S. locations as “repatriation” (HHS Assistant Secretary for Public Affairs, 2020; Shimel, 2018). These macrolevel representatives were, or should have been, aware of the evacuee’s citizenship status. Uncorrected, inappropriate messaging may counter unified operational integrity by negatively influencing responder engagement with future incident survivors.



## **Mesolevel Implications**

Community based NGOs were critical response partners, prominently featured in the federal response materials, but post impact findings indicate improved collaboration quality was needed. For example, Avilés Mendoza et al. (2021) noted that responders in the vital logistical PR location were assigned evacuee engagement roles without verified preparation and oversight. Outcome investigations confirmed insufficient pre incident partnerships were detrimental to the response efforts and were inconsistent with the spirit and intent of whole community response directives (DHS, 2016b; Disaster Mitigation Act, 2000; NASEM, 2020a; Post-Katrina Emergency Management Reform Act, 2006). Macro 65's concerns regarding compromised response and resilience, due to an absence of preincident partnering necessitates urgent remedy. Established and sustained macrolevel partnerships with community based organizations are critical, but positive social changes within the mesolevel are also necessary.

### ***Positive Social Change Implications: Mesolevel***

According to Olszewski and Siebeneck (2021), trust between partners increases with each successful joint engagement. As a vital communications bridge between the macro and mesolevels, improved bidirectional communications are needed to avoid lapses in operational singularity and oversight. Effective communications may have rectified confusion regarding decision making authority and role responsibility, facilitating accurate situational awareness among involved parties. Strategically, the American Red Cross' key role in the national strategy facilitated a communications bridge to incorporate community based NGOs into response operations (DHS, 2016a,

2016b). However, the GAO (2019b) found that the Red Cross did not share information with local volunteer agencies inhibiting their ability to serve survivors. Because NGOs may have priorities that conflict with federally mandated goals and directives, transformative operational management is necessary to avoid information or participation silos (Chandler et al., 2016; Jerolleman & Graves, 2020; Kirschenbaum, 2019; Milanese, 2016). In contrast, the ESRD collaborative evidenced the value and feasibility of inclusive interagency partnership and trust.

The trusted relationship between the ESRD Network's macro-mesolevel partnership remained intact over multiple hurricanes and infrastructure disruptions. Lessons learned from the successful collaboration of the ESRD network following Hurricanes Sandy, Irma, and Maria suggested that focused disaster readiness and response alliances to support identified vulnerable population subsets were sustainable and expandable. Responder and community based entity readiness measures, such as licensure, credentialing, and interagency training, can improve the integrity and quality of joint response operations.

### **Microlevel Implications**

Individual edification, including awareness of the national disaster response strategy and personal ADL needs, can foster reasonable expectation development and inform self readiness and advocacy. Before 2017, readiness guidance advised households to prepare to self sustain for three days (American Red Cross, n.d.). Considering the time taken for federal rescue operations to reach survivors after major disasters historically, three days of preparation was likely insufficient, particularly for isolated or rural

communities (Boersma et al., 2021; Chua et al., 2007; Jerolleman & Graves, 2020). After the Caribbean disaster, FEMA (2020) revised the guidance for disaster preparedness, advising microlevel individuals to prepare to self sustain for “several days.”

This vague advisement was certainly prudent but likely unrealistic for low income households with daily subsistence struggles. The guidance also conflicted with findings from macro and mesolevel investigations and research, described earlier, which suggested that operational strategies, rather than microlevel preparedness, were problematic. USVI evacuees were uninformed of logistics plans before relocation or afforded opportunities to retrieve essential equipment, funds, medication, clothing, or documents (ARC, n.d.; DHS, 2016b; Shimel; 2018a, 2018b; VITEMA, 2016). In those cases, aggregating emergency supply kits, as advised, will have been moot, as items were left behind. The operationalized Caribbean evacuation strategy nullified any individual plans or emergency supplies that may have been accumulated.

***Positive Social Change Implications: Microlevel***

Despite the extraction tactics employed in 2017, individual and household responsibility cannot be omitted from post impact resilience or readiness for rescue plans. However, it is unrealistic to conclude that disenfranchised or disabled persons, who survive below subsistence level, can solely self rescue or store supplies, medications, and food for potential disasters. Hyperlocal strategies, such as establishing neighborhood emergency preparedness associations, can help keep citizens engaged and informed. Such special interest groups may include community based gatekeepers from faith based, social, and charitable organizations. Such associations may opt to establish centralized

emergency supply shelters, leverage mesolevel emergency planners to provide annual readiness training, and lobby macrolevel entities for neighborhood infrastructure maintenance.

### **Summary**

Reflections on this study's transformative paradigm results denote needed systematic, survivor focused improvements to the nation's emergency management operations. Although substantive changes are indicated, reasonable, and attainable, systemic redevelopment is unnecessary because the program was designed to be agile. Despite the intent for updates and revisions, the 2017 Caribbean response outcomes indicated that revisions and updates were insufficient and incomplete. Centralized themes for substantive changes derived from this research may be categorized as responsibility, actionability, unity, and quality.

Although there are individual and corporate incident readiness obligations, some preventative measures are out of community based response agency scope and authority and, to some extent, local governments. For example, territorial governments have representational and authoritative limitations, which may inhibit equity in federal funding appropriations (Louis-Charles et al., 2021; Rodríguez-Vilá et al., 2017). FEMA and ASPR's ability to meet their delegated responsibilities, including interagency training to effectuate operational unity and ensure quality evacuee care in custody, is subject to budgetary allocations. Without adequate funding, implementing data informed, meaningful revisions to programmatic materials is compromised. Oversimplified, efficacy and actionability intersect risk management and high quality resource allocation.

## Conclusion

Resolving socioeconomic disparities that enhance vulnerability and compromise post disaster resilience is consistent with holistic readiness. Although income insufficiencies likely impacted individual preparedness, economic disparities were not the sole cause of the state of the evacuees upon arrival on the U.S. mainland. Strategic planning, communications, and oversight shortfalls unnecessarily contributed to needs gaps and enhanced evacuee vulnerability. As noted in the introduction to this study, the government program's design targeted support toward middle income populations rather than those at the highest risk of detrimental impact (Zomorodi, 2020). The cataclysmic damage to the Caribbean region muted individual income status as a resource access facilitator. Nevertheless, other shared social characteristics (e.g., territorial disenfranchisement, isolated and mountainous communities, and local economic instability with insufficient infrastructure maintenance) emerged as significant and unaddressed in the federal disaster management program, as was in 2017. As such, examining the USVI dialysis evacuee experiences has generalizable ecological relevance beyond individuals imperiled by socioeconomic factors.

The findings described in this research made a compelling case for top-down, comprehensive social change within the national disaster management structure. Federally led shifts in focus are necessary to foster meaningful enhancements at the meso and microlevels. While discussing institutional culture change toward social justice, Bryan Stevenson said "The more you disrupt systems that have operated unfairly for a long time, the more you implicate bigger issues" (Pauley & Pogue, 2022; 6:33).

Disparities in response outcomes to major incidences, such as Hurricanes Katrina, Irma, and Maria, signal that disrupting the federal response procedures is justifiable, if equity is indeed a public policy expectation. The description of evacuee experiences revealed strategies that enabled disparagement, isolation, and subjugation to emerge. Mitigating such disparities and lapses is feasible. However, the integrity of unified whole community operations remains jeopardized without actioning activities such as funding, integrated culturally cognizant training, and compliance assurance. Strategies targeting population subsets with the highest vulnerabilities will also benefit those with lesser pre incident risks, supporting sustainable dedication to social equity.

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### Appendix A: Participant Interview Protocol

This data collection instrument was tailored to probe each research question per ecological system. It was designed to comply with sound research principles and ethics requirements. The initiation of this protocol was subject to compliance reviews and approval by the Walden University's Institutional Review Board. To enhance participant identity protection, ecological groups and individual participants were assigned alpha numerical indicators and annotated on each survey.

Group Indicator	Component	Participant Indicator	Identifier
A	Macrolevel	1	Macro A1
A	Macrolevel	2	Macro A2
B	Mesolevel	1	Meso 1
B	Mesolevel	2	Meso 2
C	Microlevel	1	Micro 1
C	Microlevel	2	Micro 2

#### **Solicited study participant qualifications:**

Macrolevel: Former government representative participating in the pre, interim, or post evacuation phases specific to the USVI dialysis patients.

Mesolevel: USVI community based entity representative, participating in the pre or interim phases of the dialysis patient evacuations.

Microlevel: Cognitively intact USVI dialysis evacuee.

Microlevel: Nonmedical attendant who accompanied a dialysis evacuee or has intimate knowledge of the evacuation preparation and post extraction care and services.

**Research Questions:**

1. How did the national disaster management policies and procedures mitigate the impact of the 2017 Hurricanes Irma and Maria on United States Virgin Island’s vulnerable dialysis population?
2. What procedures ensured, or failed to ensure, evacuees were provided with dignified, individualized care and services to support equitable access to daily living necessities while in the custody of the federal government?
3. How did federal response procedures facilitate multi agency cohesion, promoting a safe extraction to re-integration continuum for evacuees?

**Interview Questionnaires**

<b>Participant Group Identifier:</b>		
<b>Macrolevel Questions</b>	<b>Responses/Notes</b>	<b>RQ</b>
1. What were your roles during the 2017 Caribbean response?		
2. How were you prepared to fulfill tasks within your role?		1
3. Did you engage directly with USVI evacuees? If yes: a. How did you convey evacuation plans and to whom? b. How were their physical, emotional, and medical needs determined and met? If no: a. How were evacuation plans communicated and to whom? b. How did logistic arrangements consider the evacuee needs, such as lodging, nutrition, access to dialysis?		a-1,2,3 b-2,3         a-1,2 b-2,3

4. Did you directly engage with partnering response agencies such as USPHS, NDMS, transportation, or dialysis center personnel involved in the evacuation of dialysis patients? If yes: a. Please describe any successes or challenges in working with partnering response agencies.		3
5. Overall, what operational strategies worked well or needs improvement?		1,2,3
6. What were the plans for the evacuees return to the USVI?		3

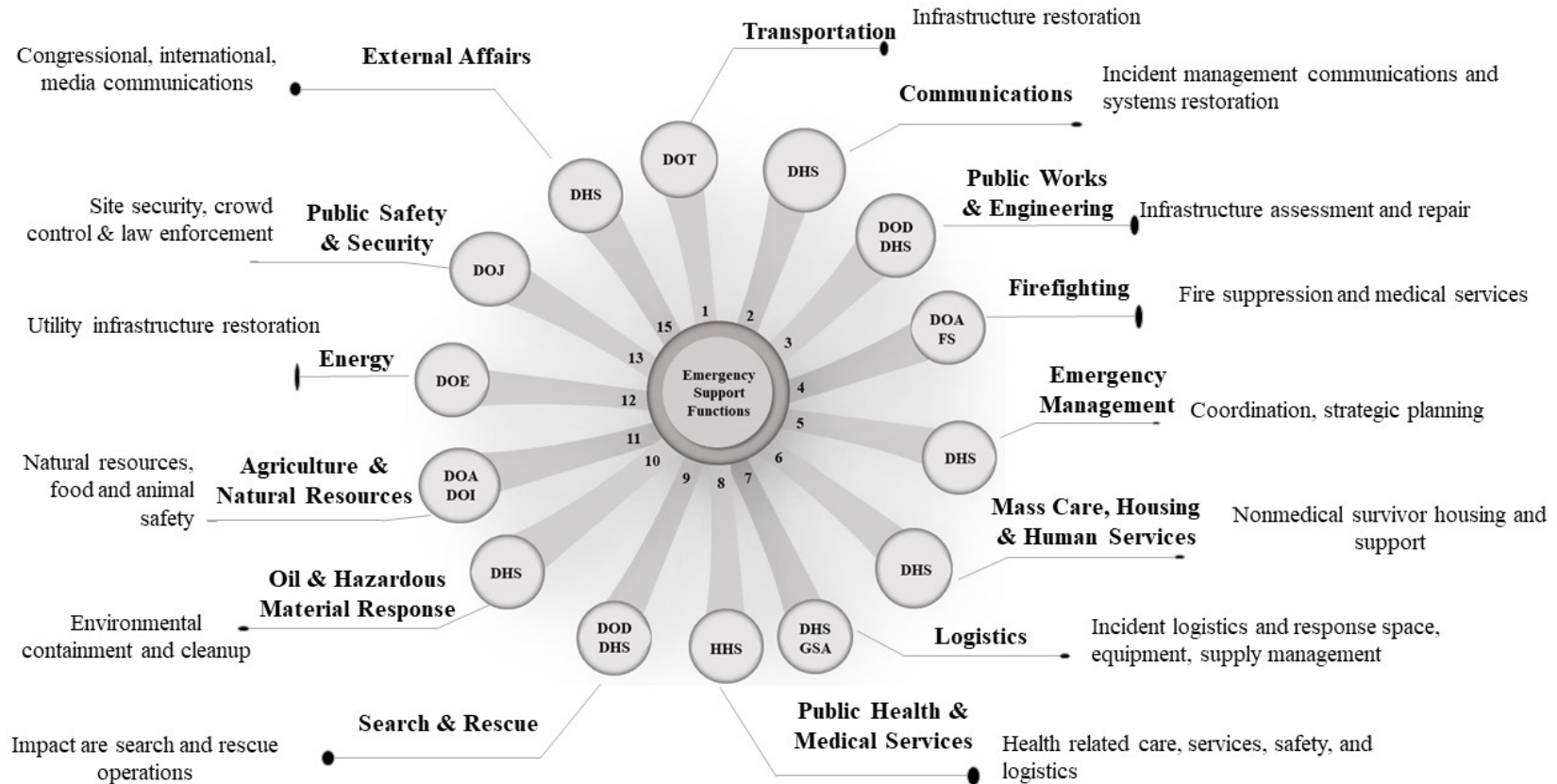
<b>Participant Identifier:</b>		
<b>Mesolevel Questions</b>	<b>Responses/Notes</b>	<b>RQ</b>
1. Had your facility participated in any emergency/disaster drills prior to 2017?		1
2. What tasks did your facility perform during Hurricanes Irma and Maria?		2,3
3. How were the patients prepared for evacuation?		2
4. How were communications managed between: a. Government representatives or supporting response agencies b. Patients/family members/attendants		a-2,3 b-2,3
5. How were transitions of care managed: a. Clinical condition and needs reporting. b. Accountability and next of kin notification		a-1,2,3 b-1,2,3
6. Overall, what went well and what did not go well?		1,2,3

<b>Participant Identifier:</b>		
<b>Microlevel Questions--Evacuee</b>	<b>Responses/Notes</b>	<b>RQ</b>
1. Were you evacuated because of Hurricanes Irma or Maria? If no, end interview		
2. How were you prepared for evacuation		2
3. Please describe what happened after you were notified. Prompts: a. Were you given choices such as when or where to go? b. Were you able to arrange for extended displacement, such as secure your home, arrange for family members or pets? c. Were you able to bring belongings such as identification, health insurance or social security cards, medications, adaptive equipment, clothing, or cash? d. Were you dialyzed before transport?		a-2 b-2 c-2 d-1,2,3
4. Please describe your travel to the US mainland. Prompts: a. What was explained regarding where you were being taken or arrangements? b. If you had questions, were they answered? c. How were your needs met between the time you left St. Thomas/St. Croix, and when you reached your final US destination?		a-1,2 b-2 c-2,3
5. Is there anything else you would like to share with me?		

<b>Participant Identifier:</b>		
<b>Microlevel-Nonmedical Attendant</b>		
1. Were you evacuated to accompany a dialysis patient? If No, end interview	Responses/Notes	RQ
If Yes:		
a. How were you informed of the evacuation plans?		a-2,3
b. Were you able to pack personal items (e.g., identification, cash, clothing, medications)		b-2
c. How did you communicate needs to government representatives, such as social services? (e.g., transportation for food, ATM, medical care)		c-2
d. Were you able to stay with your attendee throughout the displacement? If not, why?		d-1,2,3
e. What were the plans for you and your attendee's return to the USVI (e.g., transportation)		e-1,3
f. Please provide your opinions of the evacuation process, what worked well, what did not. Prompts: Were the accommodations appropriate for the evacuee's condition? Did you have access and means to contact a representative? Which procedures (e.g., plane ride, layover times, communications) worked well/did not work well How were complications remedied?		a-2 b-1,2 c-1,2,3 d-1,2,3

## Appendix B: ESF Abbreviated Component Roles

### *Emergency Support Functions*





*Note.* ESF 14 was relocated to the National Disaster Recovery Framework. Adapted from *Emergency Support Function Annexes: Introduction* by the Federal Emergency Management Agency, 2008 (<https://www.fema.gov/pdf/emergency/nrf/nrf-annexes-all.pdf>). In the public domain. *2016 Response Federal Interagency Operational Plans* (2nd ed.), by the U.S. Department of Homeland Security, 2016a (<https://www.hsdl.org/?abstract&did=795050>). In the public domain. *National Response Framework* (3rd ed), by the U.S. Department of Homeland Security, 2016b (<https://www.hsdl.org/?abstract&did=793551>). In the public domain.

## Appendix C: Major Directives and Guidance for 2017 Operations

*Key National Disaster Management Materials*

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[Disaster Relief Act of 1974](#)

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[Robert T. Stafford Disaster Relief and Emergency Assistance Act of 1988](#)

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[Disaster Mitigation Act of 2000](#)

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[DHS: Legislation Disaster authorities](#)

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[Post-Katrina Emergency Management Reform Act of 2006](#)

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[Department of Justice: A guide to disability rights laws](#)

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[DHS: National response framework](#)

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[DHS: 2016 Response federal interagency operational plans](#)

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[DHS: Recovery federal interagency operations plan](#)

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PHS Commissioned Officers Foundation for the Advancement of Public Health: Public health emergency preparedness & response: Principles & Practices

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[ASPR: Joint patient assessment and tracking system fact sheet](#)

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[ASPR: Federal patient movement Service Access Team fact sheet](#)

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[ASPR: Federal patient movement: NDMS Definitive Care Program fact sheet](#)

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[Virgin Islands Territorial Emergency Operations Plan](#)

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## Appendix D: Experiencer Pseudonyms

*Data Source Pseudonyms*

Source	Type	Pseudonym
USVI official	Testimony	Macro 12a
FEMA representative	Testimony	Macro 12b
ASPR representative	Testimony	Macro 12c
CMS representative	Testimony	Macro 13a
ASPR representative	Testimony	Macro 13b
ASPR representative	Document	Macro 18
ASPR representative	Document	Macro 20
USVI official	Document	Macro 21a
FEMA representative	Document	Macro 21b
ASPR representative	Document	Macro 65
Federal responder	Interview	Macro A-1
USVI responder	Interview	Macro A-2
NGO representative	Document	Meso 15
NGO representative	Document	Meso 24
NGO representative	Document	Meso 65
NGO representative	Social media	Meso FB 1-1
NGO representative	Social media	Meso FB1-10
Evacuee	Document	Micro 17
Community member	Document	Micro 22
Community member	Social media	Micro FB1-3
Community member	Social media	Micro FB1-8