

University of Montana

ScholarWorks at University of Montana

Graduate Student Theses, Dissertations, &
Professional Papers

Graduate School

2022

Voices of the Often Unheard: The Environmental Impacts of Catastrophic Wildfire Events on Individuals with Developmental Disabilities

Mary Madison McKenzie
University of Montana, Missoula

Follow this and additional works at: <https://scholarworks.umt.edu/etd>



Part of the [Disability Studies Commons](#), [Environmental Health and Protection Commons](#), [Environmental Public Health Commons](#), [Environmental Studies Commons](#), [Inequality and Stratification Commons](#), [Natural Resources Management and Policy Commons](#), [Place and Environment Commons](#), and the [Social Justice Commons](#)

Let us know how access to this document benefits you.

Recommended Citation

McKenzie, Mary Madison, "Voices of the Often Unheard: The Environmental Impacts of Catastrophic Wildfire Events on Individuals with Developmental Disabilities" (2022). *Graduate Student Theses, Dissertations, & Professional Papers*. 11876.
<https://scholarworks.umt.edu/etd/11876>

This Thesis is brought to you for free and open access by the Graduate School at ScholarWorks at University of Montana. It has been accepted for inclusion in Graduate Student Theses, Dissertations, & Professional Papers by an authorized administrator of ScholarWorks at University of Montana. For more information, please contact scholarworks@mso.umt.edu.

VOICES OF THE OFTEN UNHEARD:
THE ENVIRONMENTAL IMPACTS OF CATOSTROPHIC WILDFIRE EVENTS ON
INDIVIDUALS WITH DEVELOPMENTAL DISABILITIES

By

MARY MADISON MCKENZIE

Bachelor of Arts, California State University Channel Islands, Camarillo, CA, 2017

Thesis

presented in partial fulfillment of the requirements
for the degree of

Master of Arts
Sociology, Inequality and Social Justice

The University of Montana
Missoula, MT

May 2022

Approved by:

Scott Whittenburg, Dean of The Graduate School
Graduate School

Dr. Mark Heirigs, Chair
Department of Sociology

Dr. Jacobs Hammond
Department of Sociology

Dr. Rayna Sage
Rural Institute

ABSTRACT

McKenzie, Mary, Madison, M.A., May 2022

Sociology

Voices of the Often Unheard: The Environmental Impacts of Catastrophic Wildfire Events on Individuals with Developmental Disabilities

Chairperson: Dr. Mark Heirigs

The Thomas Fire for a time was the largest wildfire in California history, burning 281,893 acres and destroying 1,063 structures. Within three years, the August Complex Fire, at 1,032,649 acres, almost quadrupled that record. Climate related disasters such as these have impelled social science researchers to heed calls for a paradigm shift in understanding the risks climate change poses to the social world, in particular, disaster risks for vulnerable groups. Existing research tends to focus on disasters such as hurricanes, featuring risks for vulnerable populations by race, class, and/or individuals with disabilities in general, but not for individuals with developmental disabilities. This study attempts to fill this gap in the research by examining the impact of disastrous wildfires on individuals with developmental disabilities, using survey data obtained by asking individuals with developmental disabilities to answer questions about their experiences with the recent Thomas and/or Woolsey wildfires that occurred within the same or surrounding counties in California less than a year apart. Results suggest that those who experienced anxiety and depression before the wildfire(s) indicate an increase in symptoms after the wildfire(s) and showed signs of needing counseling or mental health services but did not seek them. Similarly, respondents indicated financial impacts after experiencing the wildfire(s) which was correlated with anxiety and depression prior to their experiences with the wildfire(s). Additionally, this research shows that the capabilities framework combined with social capital theory can provide a better analytical perspective for understanding the ways individuals with developmental disabilities experience environmental justice.

Keywords: catastrophic wildfires, developmental disability, capabilities framework, social trust, social capital, environmental justice

ACKNOWLEDGEMENTS

Many thanks to my advisor and committee for your guidance throughout my thesis and graduate school experience.

- ***Mark Heirigs**, for your encouragement, patience, and flexibility throughout this process as my advisor. Thank you for teaching and helping me grow as a quantitative researcher these past couple years, especially with your statistics and SPSS expertise.*
- ***Jacobs Hammond**, for your enthusiasm and encouragement. Thank you for sharing your environmental justice and sociological expertise as professor and committee member.*
- ***Rayna Sage**, for your knowledge, passion, and critical feedback to help improve my work and research contributions.*

Thanks to the Sociology Department and University of Montana community for sharing your skills, knowledge, and support throughout my thesis journey.

- ***Celia Winkler**, for your crucial contribution to this research. **Daisy Rooks**, for your encouragement and sense of humor. **Tim Nichols**, for your enthusiasm.*
- ***The Writing Center**, especially **Sarah Capdeville**, for your attention, welcome critical feedback, and motivation to help me improve as a writer.*
- ***My Sociology graduate school cohort** and **friends** in other graduate programs and the **Associated Students of the University of Montana (ASUM)**, who have motivated and encouraged me during my graduate school and thesis experience.*

To every individual who participated in the survey. Thank you to every social service agency, community group, and advocacy organization in Ventura and Santa Barbara Counties who helped with the recruitment for the survey. To **Christina Rodriguez** and **Maria Ajungo** for donating your time to assist in the Spanish survey translation

To **Krista Goesch** and **Ada Muzoglu** for your friendship, knowledge, and inspiration.

To **Ryan Roter**, my partner. For your support, encouragement, and love. Thank you for your honesty, patience, humor, and outstanding cooking skills!

To my family and friends, especially my parents **Beth** and **Dave McKenzie**, my sister **Whitney McKenzie**, and cousin **Janet Kittleson** for your lifelong support, love, and influence on my work ethic. **Nicki Crowley**, for your willingness to open your home to a couple of undergraduate students, opening the door for me to discover and pursue this path.

Special thanks to the **Kittleson**, **Estvold**, and **Boyle** kids for your laughter, joy, and welcome distraction from the reality of graduate school.

“When it all comes down, will you say you did everything you could?” ~Rise Against

TABLE OF CONTENTS

ABSTRACT.....	i
ACKNOWLEDGEMENTS.....	ii
LIST OF TABLES.....	v
1.INTRODUCTION.....	1
2.LITERATURE REVIEW.....	5
Developmental Disabilities	5
Environmental Justice.....	7
3.CONCEPTUAL FRAMEWORK.....	13
Capabilities Framework.....	13
Social Capital.....	16
4.METHODS.....	20
Sample.....	21
Survey	23
Survey Distribution and Data Collection	27
Data Analysis	29
5.RESULTS	30
Descriptive.....	30
Hypotheses.....	34
DISCUSSION AND CONCLUSION.....	40
Descriptive Results	41
Hypotheses Results	43
Study Limitations.....	48
Future Research	50
Research Significance and Implications	51
REFERENCES.....	56
Appendix A: Survey.....	63
Appendix B: Spanish Version of Survey.....	70
Appendix C: Recruitment Invitation.....	77
Appendix D: Survey Flyer invite.....	78
Appendix E: Zoom Script.....	79
Appendix F: Recruitment Approval Letter.....	80
Appendix G: English End of Survey Resources.....	81
Appendix H: Spanish End of Survey Resources.....	82
Appendix I: Thomas Fire (2017) and Woolsey Fire (2018) County Map Comparison....	83

LIST OF TABLES

Table 1.1: Dependent and Independent Variable Survey Questions Analyzed.....	26
Table 1.2: Demographic Characteristics of Respondents Impacted by Wildfire (N=48).....	31
Table 1.3: Evacuation Status by Race	34
Table 1.4 Evacuation Status by Hispanic/Latino Origin.....	34
Table 1.5: Mental Health Experience Before Wildfire Impact.....	35
Table 1.6: Increase in Mental Health Symptoms After Wildfire Impact.....	35
Table 1.7: Increase in Mental Health Symptoms After Evacuation.....	36
Table 1.8: Number of Increase in Symptoms After Change in Routine (multiple missed activities):.....	37
Table 1.9: Mental Health Experience Before and Financial Impact:.....	37
Table 2.1: Increase in Mental Health Symptoms and Seeking Counseling/Social Resources.....	39
Table 2.2: Correlation Matrix.....	40

INTRODUCTION

The Center for Disaster Philanthropy (CDP 2020) reported the U.S. totaled around 52,113 wildfires that had burned 8,889,297 acres in 2020, which was “approximately 2.3 million more acres burned than the 10-year average and almost double the acreage burned in the 2019 season” (CDP 2020). The state of California experienced its worst wildfire season on record in 2020, with approximately 4.2 million acres burned, about 10,488 structures destroyed, and 31 people killed (McGrough 2020). In fact, five of the six largest wildfires on record in California occurred in between 2020 and 2021 (CAL FIRE 2022). When the Thomas Fire occurred in December of 2017, it was the largest wildfire in the state’s history at 281,893 acres (Andone 2018). In the nearly 3 years after the Thomas Fire, the August Complex Fire was declared the largest at 1,032,649 acres (CAL FIRE 2022), almost quadrupling the previous record.

What is alarming about this information is that the risk of catastrophic disasters like wildfires in the U.S. appears to be increasing in prevalence and overall destruction that leaves a lasting imprint on the environment. In response to the change in climate over the past decade, researchers have looked at the biological (infectious disease and ecosystem), meteorological (storm), hydrological (flooding), and climatological (extreme temperature, drought, and wildfire) impacts on climate-driven catastrophes. Multidisciplinary collaborators seek to understand what can be done to bring together climate science, adaptation, and risk management to strategize and plan for disaster relief, community planning, and development (Sauerborn and Ebi 2012).

The need to understand and prevent the occurrence of climate related disasters is indeed important. However, at the forefront of these disasters lie human beings having to quickly respond and adapt to this change. More importantly, reflecting on previous disaster research in the social sciences can be an important tool to discover the various ways in which society is

impacted by catastrophic disasters and what (if anything) can be done differently to prepare and respond. For example, Beck asked, “in order to understand the manufactured uncertainty, lack of safety and insecurity of world risk society is there a need for a paradigm shift in the social sciences?” (2006:331). This question highlights the importance of taking on a new and specific theoretical lens when it comes to disaster research. The research presented in the current analysis draws on Beck’s question in order to better understand the societal risk, social trust in government and institutional responses, and the environmental impacts of climate-driven catastrophes.

The significance in how these destructive wildfires impact communities alone is enough to call attention to the social vulnerability of the general population. However, in my experience with the 2017 Thomas Fire, I have discovered that communities are not prepared to deal with the infrastructure risks present, let alone predict how fast moving and destructive these wildfires can be. For example, the only reason why my partner and I knew that the fire was rapidly approaching our apartment building was due to the screaming and yelling outside, followed by our neighbor pounding at our door to get out. This experience has inspired the current analysis of how vulnerable populations, like individuals with developmental disabilities, might respond when they are faced with the same challenges, and if the system is prepared enough to include everyone in the response to disasters such as these.

Due to the omitted features in the existing literature, this research aims to take on a more specified theoretical analysis to catastrophic wildfire disasters. First, there is a gap in the research that appears to seldom focus on wildfires and certain features of vulnerable populations of people. For instance, disaster research, especially in the social sciences, is lacking in terms of understanding wildfire risk and the environmental impacts on vulnerable people such as

individuals with developmental disabilities. Existing research does focus on disasters, but mainly focuses on recent hurricanes like Katrina and Sandy (Gaskin et al. 2017; Learning and Guha-Sapir 2013; Sauerborn and Ebi 2012; Weibgin 2015), often overlooking the need for wildfire disaster research on vulnerable populations. In addition, disaster research features risks for vulnerable populations by race, class, and/or disabilities in general (Weibgen 2015), leaving out discussions of developmental disabilities or addressing the impact on this population as a footnote in the research.

This research is the first to examine the environmental risks associated with individuals with developmental disabilities who have been impacted by recent California wildfires. More specifically, this research identifies variable risks such as quality of life measurements of a person's mental health, environment (standard of living, access to services, clean air, water, power, food, etc.), financial or employment status, and levels of social trust. All of these factors may contribute to the vulnerabilities individuals with developmental disabilities might face during and following a wildfire disaster.

The research questions include:

1. What are the environmental risks of individuals with developmental disabilities experiencing negative side effects from a wildfire(s) due to evacuation/displacement; changes in routine (school, work, day program, etc.); and access to clean air, water, power, and food?
2. How does experiencing negative side effects from a wildfire(s) relate to their knowledge of/access to/or use of disaster and mental health resources?
3. What impacts do wildfire disasters have on individuals with developmental disabilities in terms of their mental health and financial well-being?

4. What are the levels of an individual's social capital in association with neighborhood, local community, and government trust in relation to their environmental risks, mental health, and financial well-being?

These research questions will assist an exploration of the environmental impacts of climate-driven catastrophes (wildfires) on individuals with developmental disabilities.

Additionally, based on the environmental impacts, resource knowledge/ utilization, and levels of social capital analyzed in this research, the findings have the potential to contribute to making policy changes aimed at improving the inclusivity of disaster preparedness and responses for individuals with developmental disabilities.

Convenience sampling was used to recruit participants through local social service agencies, community groups, and advocacy organizations known to serve the population in Ventura and Santa Barbara Counties in California. To answer these questions this quantitative research utilized a survey created using Qualtrics to give individuals with developmental disabilities an opportunity to answer questions about their experiences with the 2017 Thomas Fire and/or the 2018 Woolsey Fire. Upon completion of the surveys, the methods used for analysis included a Pearson chi-square test and correlation coefficient to test for significance and relationships between variables, in addition to analyzing a frequency distribution to describe the demographic characteristic responses.

LITERATURE REVIEW

Developmental Disabilities

For the purpose of this research, it is important to understand what a developmental disability is and why this population is important to consider in disaster research. The name developmental disability is used to describe a broad category of diagnoses that can encompass both intellectual and/or physical characteristics (CDC 2020). For instance, Autism Spectrum Disorder (ASD), Down Syndrome, Fragile X Syndrome, Fetal Alcohol Syndrome (FAS), Intellectual Disability (ID), Cerebral Palsy, and Epilepsy are some examples of developmental disabilities which cause certain limitations in physical and cognitive functioning skills, including communication, social, and self-care.

When approximately 6 million people in the United States (Disability Justice 2022) fall into the category of likely experiencing lifelong challenges with learning, mobility, self-care, independent living capacity, and/or economic self-sufficiency, it reflects the requirement of specialized public supports and services that aim to meet the basic needs of individuals. While the United States has made significant improvements since the Americans with Disabilities Act (ADA) was passed in 1990 (Americans with Disabilities Act 1990), the history of disability rights did not begin and end with its passing almost 32 years ago. This long overdue civil rights law, which prohibits discrimination of individuals with disabilities, came on the heels of decades worth of activism and civil rights legislation inspired by the various social movements of the 1960s and 1970s (Access Living 2019).

One of the most influential historical movements for disability rights was the deinstitutionalization movement (Access Living 2019). Starting in 1955, this movement was in large part sparked by the introduction of the first effective and widely accepted antipsychotic

medication chlorpromazine (Thorazine) (Access Living 2019) and sociological influence from Wolfensberger. Wolfensberger (1972) helped to shape policies that enable individuals with developmental disabilities to live in the most “normal” setting possible instead of an institution. The deinstitutionalization movement continued from 1955 to 1994, and arguably continues to this day (Access Living 2019). This movement occurred alongside the heavy influence of the independent living movement which is founded in the principle that individuals with disabilities have the same civil rights and control over their lives as people without disabilities. More specifically, disability care shifted from a medical model of institutionalization and control over the individual, to the independent living model developed by Gerben DeJong in the late 1970s (DeJong 1979).

This model influenced advocates like Wade Blank who founded the Atlantis Community, a model for community-based, consumer-controlled, independent living, and Ed Roberts, a UC Berkley student who founded the Berkley Center for Independent Living (CIL) in 1972. CIL advocates for “dignity, peer support, consumer control, civil rights, integration, equal access, and advocacy” (Access Living 2019), embodying many of the core values that the disability rights movements of its time represented. It was progressive shifts such as these that helped to inspire other CILs to establish themselves across the United States, with over 400 CILs currently operating (Access Living 2019).

It is important to recognize that the shift from institutionalized care (hospitalizations) to less isolating and discriminatory community-based services has gained a substantial amount of momentum (PBS 2005). However, independent living advocates for this population argue that not nearly enough resources were invested in home and community-based services that enable people with disabilities to live, work, and play in their communities since the shift occurred

(Administration for Community Living 2022). Consequently, there seems to be a connection between the lack of adequate resources for individuals with developmental disabilities and their inclusion within the topic of disasters.

Environmental Justice

Connections between individuals with developmental disabilities and the topic of disasters can be better understood by reviewing previous disaster research through the lens of environmental justice. Bullard (1996) described environmental justice as the concept that “all people and communities are entitled to equal protection of environmental and public health laws and regulations.” More specifically, it is primarily concerned with the fair and equal distribution of environmental goods and bads (Kuehn 2000). According to Bullard (2008:757), what is often referred to as a "natural" disaster in reality is an act of “social injustice perpetuated by government and business on the poor, people of color, the disabled, the elderly, the homeless, those who are transit dependent and non-drivers - groups least able to withstand such disasters.” Bullard’s (2008) extensive research on this concept contends that attempts on behalf of the government to prevent or mitigate the impacts of disaster vulnerability are not equally distributed.

This review will present evidence for the existing disaster research that addresses the vulnerabilities and environmental injustices individuals are faced with, but does little to address the vulnerabilities of individuals with developmental disabilities as they encounter disasters. Providing evidence of the disproportionate impacts of previous disasters such as catastrophic hurricanes, heat waves, and wildfires will help to formulate why it is important to consider the experiences of individuals with developmental disabilities who may not experience disasters equally.

Individuals with developmental disabilities are often left out of the conversations of disaster research preparedness regarding planning, response, and resources that are inclusive of varying levels of individual capabilities in society. For example, Decker et al. (2015) conducted a qualitative analysis of individuals with disabilities affected by the 2006 Hurricane Katrina. The authors discovered several different categories (limitations) that placed individuals with disabilities at greater risk in adequately recovering from the disaster. These factors included limitations of existing inequalities in housing, transportation, employment/financial status, and accessing services (Decker et al. 2015).

What is alarming in this article was that individuals with disabilities not only have a difficult time recovering from disasters, but also struggle in the evacuation process due to existing disadvantages such as class and disability status. Where one lives, access to transportation, wealth, and access to inclusive disaster recovery resources all play a role in one's ability to survive and/or recover from a disaster. These factors bring into question just how prepared communities are to accommodate for individuals who rely on the system to keep them safe during times of need.

In further discussion of the results, specific limitations in disability status enhanced the challenges that individuals experienced in the disaster recovery process and in acquiring resources that were inclusive. The findings suggest that when disaster recovery resources were not accessible or inclusive to all abilities, the recovery of individuals with disabilities from disaster was hindered. The authors highlight that "recovery efforts should include building accessible infrastructure and services that will allow for participation by all" (2015:387). While the authors did not focus on wildfire disasters, connections can be made in their analysis of the risks of hurricanes in comparison to wildfire disaster risks exacerbated by

climate change. Additionally, while this research is one example of the gaps in disaster literature that only briefly mentions individuals with developmental disabilities, comparisons can be made concerning the risks that individuals with disabilities in general face in response to a disaster.

Similar research by Gaskin et al. (2020) focused on individuals with disabilities and the factors that are associated with climate change vulnerability and adaptive change. What their review found was that various aspects of vulnerability were present among individuals with disabilities, such as, personal features (female gender, uncoupled or living alone, nonwhite race and low income), environmental factors (access to government and disability resources), and factors related to bodily function impairments (cognitive, hearing, sensory, etc.).

These various aspects of vulnerability highlight intersectionality—people experiencing multiple simultaneous oppressions, placing them at higher risk in how they will adapt to a disaster. An informative aspect of Gaskin’s (2020) research was that there was extensive information available when it comes to physical, cognitive, and sensory impairments contributing to the vulnerability for individuals with multiple sclerosis, schizophrenia, spinal cord injuries, and Alzheimer’s disease. However, Gaskin (2020:810) notes an important distinction related to the lack of available information regarding individuals with intellectual disabilities, stating:

Despite such issues potentially also affecting people with intellectual disability, minimal information was found relative to their vulnerability and adaptive capacity. Although people with intellectual disability participated in some studies (e.g., Lazrus et al. 2012), their data were typically pooled with that of people with other types of impairments. Similarly, there was limited evidence of the vulnerability and adaptive capacity of people with sensory impairments.

This notation, combined with the literature mainly analyzing the impacts of recent hurricanes or thermal heat exposures, provides further evidence that there is a gap in the research on wildfire disasters, including impacts regarding individuals with developmental disabilities.

Further studies that can contribute to this conversation include research by Gershon et al. (2017), in which they conducted a qualitative study of 50 elderly individuals receiving home health care to assess their disaster preparedness. Gershon (2017:606) stated:

Over 60% of the participants reported that they had not made back-up plans for caregiver assistance during times of crisis, 74% had not made plans for transportation to a shelter, 56% lacked a back-up plan for electrical equipment in case of power outages, and 44% had not prepared an emergency contacts list- the most basic element of preparedness.

Results are alarming given that even elderly home health care does not ensure that those receiving home care have an adequate disaster plan in place. While the elderly is a separate population, similar limitations in intellectual (cognitive) and physical capabilities can be applied to individuals with developmental disabilities.

For instance, similarities in living situation can be applied to the findings for elderly individuals because many individuals with developmental disabilities require a secondary care provider to assist with daily living (Disability Justice 2022). Living in group homes, independent living housing, or with a primary care provider (parent or legal guardian) is almost always a certainty, meaning that these populations face similar risks. Based on these similarities, the structural failure to provide adequate disaster preparedness for individuals with disabilities should be pointed out as a failure in the form of environmental injustice.

A recent example of this type of environmental injustice highlights what can go wrong when a community is not prepared to account for its most vulnerable residents during disaster events. What is historically known as the Camp Fire devastated the town of Paradise, CA in

2018, destroying 18,804 structures, killing at least 85 people (majority over age 65), and wiping out the entire town (McGough 2020). At this time this was the most destructive wildfire to date in California history, and lessons can be learned from the failure of the city to provide adequate preparation, alerts, evacuation, and shelter plans given a population that was vastly overrepresented of people who are older and/or disabled (PBS 2019).

Following the 2018 Camp Fire, a state audit (Auditor of the State of California 2019) revealed that Butte County (where the fire occurred) had not adequately prepared to assist individuals with “access and functional needs,” and that the California Governor’s Office of Emergency Services did not provide the proper guidance for local officials to develop emergency plans to protect this population, thus resulting in a significant loss of life (Auditor of the State of California 2019) . Since this discovery, reports on the widespread goals for several California communities to partner with disability organizations have become part of the emergency planning process. However, similar examples like the 2021 Dixie Fire call attention to the growing concern of wildfire risks for vulnerable populations that remain unaddressed.

In 2021, California continued to struggle with enormous wildfires like the Dixie Fire which became the largest non-complex wildfire (merging of multiple wildfires into one) in recorded California history at 963,309 acres (CAL FIRE 2022). Reports on the devastation of the Dixie Fire recounted the risks of wildfire impacts on the elderly and disabled populations; citing that communities in rural Northern California areas that are home to a significant population of individuals with disabilities, and face challenges in providing enough critical infrastructure and resources to support them when disasters occur (Morris 2021). Crucial plans for preparation, evacuation, transportation, and shelter are concerning aspects of environmental justice that remain unfulfilled for individuals that require assistive care (caregiver), mobility devices,

adaptive technology/transportation, etc. (Morris 2021). These plans for infrastructure and resources should include inclusive disaster preparedness training for caregivers and individuals, evacuation notifications and assistance, and shelter or community health centers that are ADA accessible and include resources for back-up power.

What is alarming about this ongoing environmental justice conversation regarding disasters is that it is not a recent conversation in terms of disasters impacting the population unequally. Looking back to a critical shift in societies understanding of the dangers of climate-driven catastrophes, the 1995 Chicago heat wave that lasted a week, reached blistering temperatures of 106 degrees, and killed over 700 people, exemplifies known accounts of environmental injustice. Klinenberg (2015) embarked on a critical “social autopsy” of the 1995 heat wave, in which results indicated that several environmental factors influenced an individual’s capacity to adapt, survive, and recover from the disaster. These factors included disproportionate impacts determined by race, age, income, and geographical location disparities among urban city residents. Meaning, most residents who perished in the heat wave were elderly, lived on a low or fixed income, lived alone, and were socially isolated from their community due to the location in which they lived in the city (Klinenberg 2015).

As previously mentioned, Hurricane Katrina was a catastrophic-disaster that killed over 1,800 people in the New Orleans Louisiana area, the majority of which were older and disabled (Brunsmas et al. 2010). In response, congress passed a law (U.S. Congress 2006) requiring the Federal Emergency Management Agency (FEMA) to appoint a disability coordinator tasked with developing guidelines to better serve people with disabilities. While this had the potential for groundbreaking steps to provide more inclusive protection and resources for the disability population, a 2019 “accountability report” revealed that FEMA failed to provide “comprehensive

disability training to its staff” and that their 2019 “emergency preparedness report” did not mention individuals with disabilities (U.S. Government Accountability Office 2019). With all the evidence combined considering the increased risk of wildfire disasters and the unequal distribution environmental harms, this analysis contends that closer attention should be given to vulnerable groups of people when it comes to wildfire disaster preparedness. Furthermore, focusing on how climate-driven disasters impact individuals with developmental disabilities is unique because it has only been a footnote in the already limited number of studies done on this topic. In addition, most of the disaster literature focus their research on hurricanes, and based on the noted prevalence in climate-driven wildfires becoming normative in recent years, understanding how this type of disaster impacts this population is extremely important.

CONCEPTUAL FRAMEWORK

Capabilities Framework

The capabilities framework aids in the understanding of how this population is socially at risk and will be used to frame the current analysis (Emerson and Hatton 2014; Nussbaum 2011; Nussbaum and Sen 1993). This framework is defined as an approach to compare quality-of-life assessments and to theorize about basic social justice (Nussbaum 2011). In theory it holds that the key question to ask when comparing societies and assessing them for their basic decency or justice, is, “what is each person able to do and to be?” (2011:18). The approach asks not just about the total or average well-being of individual entities (countries, states, cities, communities), but takes into consideration the opportunities available to each person. At the most basic level, according to Nussbaum (2011), this approach analyzes various levels of capabilities in terms of comparisons in quality-of-life assessments. The assessments are concerned primary with social injustice

and inequality, especially capability failures that are the result of discrimination or marginalization. It affirms the *task to government and public policy*—essentially, “to improve the quality of life for all people, as defined by their capabilities” (2011:18).

The capabilities framework has been increasingly utilized as a tool to address, understand, and document existing inequalities in society (Nussbaum and Sen 1993). Previously, the capabilities framework has been utilized as a model in the work and economic sector to understand how nations are developing and what levels of inequalities are experienced in the workforce (Emerson and Hatton 2014). Disability research has used this framework to document and understand the social and health inequalities that individuals with intellectual disabilities are faced with. For example, Emmerson and Hatton (2014) employed a quality-of-life approach to address concerns with social inequalities, disproportionate health inequalities, and access to inclusive education, work, housing, transportation, and leisure/recreation.

The current analysis utilizes the capabilities framework to understand the existing social and health inequalities that exist for individuals with developmental disabilities. To apply the capabilities framework to this research it is important to understand how wildfires may impact this population disproportionately due to their existing risk factors. To do this, it is necessary to understand how this population functions in their day-to-day life experiences. For instance, using an example of a specific type of developmental disability such as Autism Spectrum Disorder (ASD) can be useful. The CDC estimates that in 2018, 1 out of every 44 children are diagnosed with ASD (CDC 2022a), and the Diagnostic Manual- Intellectual Disability (DM-ID-2) classifies it as a neurodevelopmental disorder characterized, in varying degrees, by difficulties in social interaction, verbal and non-verbal

communication, and repetitive behaviors (Barnhill, Cooper, and Fletcher 2016). In everyday life for someone with ASD, this can be seen as difficulties with socialization (lack of social/emotional reciprocity), pragmatics (difficulty regulating and identifying emotions), communication (delayed or absent verbal communication or gestures), and behaviors (inflexible adherence to routines and hypersensitivity).

Certain characteristics of a diagnosis like ASD that makes this population vulnerable to wildfire risks can be understood by visualizing how a person who struggles with changes in routines, delays in executive functioning (decision making skills), and hypersensitivity to sensory processing might respond to a traumatic life event. Moreover, research on trauma and individuals with intellectual disabilities (ID) has found that this population experiences trauma differently and more frequently than those without ID (McGilvery 2018). This is due to the aforementioned diagnostic characteristics placing them at higher risk to social/emotional vulnerabilities in society. For example, individuals with ID are at greater risk to experience difficulties with behavioral challenges and negative impacts on their psychological/ emotional well-being. These challenges may appear as emotional or psychological dysregulation (yelling, aggression, self-injurious behavior, delayed or increased speech patterns, etc.), which on the surface can lead to a negative societal perception, causing an increase in experiencing frequent bullying and social rejection/isolation.

The present vulnerabilities this population face have put them at greater risk to experience psychiatric disorders (anxiety, depression, PTSD, etc.) in comparison to the neurotypical population (Barnhill et al. 2016). Based on this evidence on what makes them vulnerable in general (difficulties regulating emotions, delayed decision making, and difficulties adhering to changes in routines), the current analysis argues that these factors may make them

more vulnerable to wildfire risks (loss of property, dislocation, smoke inhalation, and other health risks – including negative impacts on their mental health and even death) (Barnhill et al. 2016). While this information is useful, these risks should be analyzed further in terms of the mental health impact that disasters have on individuals with developmental disabilities.

For example, emerging research has recently revealed that 25-50% of individuals in the general population who are exposed to an extreme weather disaster are at risk of adverse mental health impacts (NIHCM 2022). Therefore, providing appropriate resources to assist in coping with these challenges is crucial to ensure that we are helping this population improve their quality of life. Not only preparing the population for climate-driven catastrophes, but also ensuring the accessible allocation of social and mental health services, as well as displacement aid (transportation, housing, etc.) to this vulnerable population during and following catastrophic events like a wildfire.

Social Capital

Social capital theory asserts that interpersonal relationships and a mutual identity between social groups are tools that can lead to the development or accumulation of human capital (Machalek and Martin 2015). This can be thought of in terms of the varying level or access to resources that are embedded in relationships with and between other people. For instance, someone with a developmental disability would have more access to information and resources to responding to a disaster if they have an existing good relationship with their Direct Support Professional (DSP) or Service Coordinator, and this professional has been trained to help the individual be better prepared (e.g. have an evacuation plan, get signed up for evacuation alerts, etc.). Therefore, the multi-dimensional levels of social ties to family, neighbors, communities, and institutions, influence an individual's social capital (social trust) in terms of

the varying degrees of access and/or trust in the resources available and utilized (Bourdieu 1986).

According to Bourdieu (1986) this concept can be employed to understand inequalities that exist in society based on disproportionate advantages and disadvantages. Connecting this concept to disaster research and understanding the disproportionate risks society is faced with, the social capital framework can be tied to the capabilities framework and environmental justice. Such that, a quality-of-life (capabilities) assessment for an individual with a developmental disability can relate to their levels of social trust, and therefore may influence how they prepare, respond, and recover from a disaster (environmental justice).

Considering the history of disability services in the U.S. and around the world, the treatment of the population in society is an important influence on an individual's social capital that impacts their social trust. For instance, as previously mentioned, it was not that long ago in U.S. history when "deinstitutionalization" (e.g., closing of mental hospitals) occurred between 1955 and 1994 (PBS 2005). While this was a giant leap toward progression for individuals with mental and cognitive disabilities, institutional discrimination is still prevalent in the formal and informal sectors of society (jobs, housing, schooling, etc.) (PBS 2005). Meaning, that the equity of social resources for individuals with developmental disabilities and other similar groups is still in its infantile stages.

Furthermore, accounts of discrimination and exclusion from mainstream social networks are experienced frequently by this population and certain viewpoints and beliefs not only influence their social capital – but their experiences and historical perspectives likely have a negative impact on their trust in society (neighbors, community, government, etc.) (Emerson and Hatton 2014). For instance, qualitative studies between 1999 and 2013 of Canada, the UK, and

Hong Kong reported that people surveyed without disabilities in these countries still hold negative attitudes or beliefs regarding the rights of individuals with intellectual disabilities (ID) and express an unwillingness to interact with them socially (Emerson and Hatton 2014).

For example, in a telephone survey of 1605 adults out of Canada, 40% of respondents did not think adults with ID should have the right to drink alcohol, 30% did not think they should have a right to have children, and 25% did not think that adults with ID should have the right to walk around town unaccompanied (Emerson and Hatton 2014). Similarly, one in three adults from of Hong Kong surveyed reported that people with ID “should stay within their supported accommodation services, and one in of six reporting that these services should be built ‘far away’ from residential centers” (2014:68). This negative connotation toward individuals with developmental disabilities is an important feature of disaster research because when a group of individuals displays or experiences a lack of social trust, this in turn may influence this populations disaster risk due to a lack of appropriate ties or knowledge of community-based disaster preparedness and resources.

To highlight this point, recalling the discussion surrounding wildfire disasters in recent years can assist in exemplifying the strength of an individual’s level of social trust that may influence their experience and level of impact from a disaster. Studies on the impact of recent wildfire events have uncovered the various social vulnerabilities on the general population, especially regarding wildland fires within rural and urban interfaces of the western U.S. (Paveglio et al 2015; Abrams et al 2015; Carroll and Paveglio 2019; Paveglio et al 2019). One distinctive quantitative analysis by Carroll and Paveglio (2019) analyzed the local expression of vulnerability and discussed how historical or ongoing social dynamics contributed to its

occurrence following the 2012 Dahl Fire, which burned approximately 22,000 acres in Musselshell County, Montana.

Carroll and Paveglio (2019) utilized Paveglio et al.'s (2015) categories of wildfire impact to organize and understand community effects from the 2012 Dahl Fire. Their methods included conducting 51 in-person interviews with residents, civic officials, and fire professionals. Results indicated that distinct differences in wildfire impact (loss of home, evacuation, recovery) were influenced by the strength in one's ties to the community and their location (where they lived). Those who experienced the most significant challenges due to the wildfire were newer community members with weak ties to the community, lived in higher elevations, and lacked fire safety awareness given their location (surrounded by trees in a wooded elevated area).

In addition, their results highlighted how differences in the local culture influenced the divergence of strong community ties strengthening one's acceptance of recovery assistance. Difference noted were that the weak community ties and more individualistic nature resulted in more caution of outside aid or other programs – influencing a more significant impact (Carroll and Paveglio 2019). Meaning, when an individual exhibits lower levels of social trust, it may influence their community ties, and thus result in lower levels of acceptance of disaster preparedness, assistance, and recovery.

METHODS

The current analysis created and distributed a survey among social service agencies, community groups, and advocacy organizations known to serve individuals with developmental disabilities in Ventura and Santa Barbara Counties in California. This survey was created to understand the wildfire impact on individuals with developmental disabilities who lived in the area(s) impacted during the 2017 Thomas Fire and/or the 2018 Woolsey Fire. In doing so, this survey is unique in that it gives individuals with developmental disabilities an opportunity to share their own experiences by taking a survey. Conducting this study was intended to fill a gap in disaster research by surveying a population impacted by recent wildfire events. It was also unique in that typical disaster research is often qualitative (structured interviews) in its methodology, in addition to lacking research on individuals with developmental disabilities. Therefore, comparisons in the analysis portion of this study can only be made among the survey participants due to a lack of available quantitative data on this topic.

Given the extensive review of the history of individuals with developmental disabilities and features of environmental injustice in disaster literature, the conceptual framework of measuring how society enables one's capabilities (i.e. quality of life – basic needs assessment, access and knowledge of resources, mental health status, etc.) and their levels of social capital or trust (ties and trust in community/government), were utilized in measuring how individuals with developmental disabilities experience wildfire impacts through environmental justice.

Thus, I hypothesize that:

H1: Individuals with developmental disabilities who are at a greater risk mentally prior to a wildfire disaster, will be at greater risk of an increase in symptoms during and after a wildfire when they are directly exposed.

H2: Individuals with developmental disabilities who were impacted by a change in their daily routine due to the wildfire will have an increase in mental health symptoms and experience a financial impact.

H3: Individuals with developmental disabilities who were impacted financially and mentally will have lower levels of social trust.

H4: Individuals with developmental disabilities who did not have knowledge of adequate resources for preparedness and assistance before, during, and after the fire will have lower levels of social trust.

H5: Individuals with developmental disabilities who were impacted mentally and/or financially due to the fire, will have an increased risk of not having access to adequate resources for preparedness and assistance before, during, and after the fire.

Sample

Convenience sampling was the method that was thought to be the most useful due to the population size (6 million) of individuals diagnosed with a developmental disability in the U.S. (Disability Justice 2022). This was done due to the target population in Ventura and Santa Barbara Counties, which consists of approximately 8,000 individuals with developmental disabilities served in the area (Channel Islands Social Services 2020). In addition, this method was beneficial because lists of the county population for this group either do not exist, and/or would be expensive to complete a list due to the large size.

The two counties surveyed in the sample are located adjacent to one another just north of Los Angeles County along the southwestern Pacific coastline of California (See Appendix I for Wildfire by County Map Comparison). First, Santa Barbara County was chosen because it was one of the counties impacted by the 2017 Thomas Fire, which burned 281,893 acres, destroyed

1,063 structures, killed 2 people, and caused the evacuation of over 100,000 residents (“Thomas Fire” 2022). Santa Barbara County consists of a population of approximately 446,475 people, with the reported demographics being 50% female, 46% Hispanic or Latino, 43.8% non-Hispanic or Latino (White alone), 85.4% White (alone), 2.4% Black or African American, 2.1% American Indian and Alaska Native, 6% Asian, and 0.3% Native Hawaiian or Pacific Islander. Economically, Santa Barbara County has a reported median household income of approximately \$78,725 and a poverty rate of 10.5% (U.S. Census Bureau 2021a).

The second county surveyed was Ventura County, which was not only impacted by the Thomas Fire in December of 2017 but was also impacted by the Woolsey Fire almost a year later in November of 2018. The Woolsey Fire was smaller in size (96,949 acres), but impactful enough to destroy 1,643 structures, kill 3 people, and evacuate more than 295,000 residents (“Woolsey Fire” 2022). Although Ventura County is about twice as big with a population size of approximately 839,784 people, the demographics are relatively similar. The reported demographics are 50.5% female, 43.2% Hispanic or Latino, 44.7% non-Hispanic or Latino (white alone), 84.1% White (alone), 2.4% Black or African American, 1.9% American Indian and Alaska Native, 7.9% Asian, and 0.3% Native Hawaiian or Pacific Islander. Comparatively, the median household income for Ventura County is slightly higher than Santa Barbara County at \$89,295, and a similar poverty rate of 9.1% (U.S. Census Bureau 2021b).

Social service agencies, community groups, and advocacy organizations known to serve this population in one or both counties were contacted via publicly available email or phone contact information and through personal contacts to help distribute the survey. Of those who distributed the survey, five social service agencies and one advocacy organization were known to serve both Ventura and Santa Barbara Counties, one advocacy organization and one community

group were known to serve Ventura County. Two social service agencies and one community group were personal contacts who I knew through my time living and working in Ventura County as a Behavior Specialist and Respite Caregiver. The names of the agencies, organizations, and groups will not be shared in this analysis for the purpose of ensuring anonymity and protection of the individuals served. Details on correspondence with each is described below in the *Survey Distribution* section.

Survey

Qualtrics was used to distribute the survey, which is an online survey platform utilized to create an online survey that included the formatting, display resources, and additional language capabilities that ensured that the survey was accessible to the target population being surveyed. Using an online survey for this research was the best method for this study to capture a large number of participants through social service agencies, community groups, and advocacy organizations that serve a significant portion of the population.

Various measures for survey accessibility and inclusivity were taken in the creation of the survey given the target population. First, the survey was reviewed for inclusive language and formatting by three professionals who have experience working with individuals with developmental disabilities as well as one individual diagnosed with Autism Spectrum Disorder (ASD). The survey was also pre-tested by three more individuals to ensure proper flow, understanding, and inclusive comprehension.

Next, it was anticipated that participants may require the assistance of adaptive technology or the help of a parent, legal guardian, or caregiver to read the questions to them and have them answer. Informed consent was required for individuals taking the survey by asking “have you read the instructions (or had someone read them to you) and do you agree with the

terms of participation?” (yes or no?). Allowing this option was thought to be particularly beneficial because it likely gave individuals with developmental disabilities the ability to have their voices heard even if they were not physically taking the survey. A mail-in version was also offered in the recruitment process for respondents to request (Appendix C). Lastly, based on the demographic characteristics of the populations being surveyed, 43.2% Hispanic/Latino (Ventura County) and 46% Hispanic/Latino (Santa Barbara County), a Spanish version of the survey was created to give Spanish speaking respondents an opportunity to participate in the survey. This allowed for an increased level of inclusivity and those who are doubly vulnerable due to disabilities and language barriers.

The survey included 29 questions that encompassed five components based on the dependent and independent variables (Appendix A and B). The dependent variables (Table 1.1) measured level of impact from a wildfire and included questions that asked about the environmental impacts before and after wildfire exposure. Specifically, questions of impact involved asking about their perceived degree of impact by asking them to indicate the level (not impacted, somewhat impacted, slightly impacted, very impacted), in addition to evacuation experience questions (where you evacuated, and for how long).

Next, financial impact was measured by asking if they experienced a financial impact in terms of missed work, lost job, lost/damaged home/property, increased travel, or increased medical expenses. Daily living impact was measured by asking if they missed out on aspects of their daily routine such as their school, work, day program, or other daily activities. Basic needs impact was measured by asking if they experienced a loss of power, loss of clean air, loss of clean water, and/or a loss of food. Mental health experiences before the fire were measured by asking if they struggled with anxiety or depression before their wildfire experience, and impact

on mental health was measured by asking if they experienced an increase in symptoms due to the wildfire (panic attacks, worrying/anxiety, depression, social isolation, stress, insomnia, nightmares, aggression).

The independent variables (Table 1.1) were broken down into four components: knowledge of resources, access and use of resources, demographics, and social capital. More specifically, the social capital (social trust) component of social trust was measured by using a selection of Grootaert et al.'s (2014) survey questions which include questions pertaining to trust and solidarity in an individual's neighbors, community, and government officials (Table 1.1). Knowledge of resources was measured by asking respondents to indicate if they were aware of any local and/or government resources that are available to residents in the Santa Barbara and Ventura County areas to assist in disaster preparedness, response, and recovery resources. These resources included Ready Ventura County, Ready Santa Barbara County, American Red Cross, Federal Emergency Management Association (FEMA), SAMHSA Disaster Distress Line, and Smart 911. All the resources were listed at the end of the survey providing links to each (Appendix G & H).

Access and use of resources was measured by asking respondents who were impacted and experienced an increase in mental health symptoms if they sought counseling/social resources to cope with the aftermath of the wildfire. The responses available to them included yes, sought counseling resources; yes, sought social resources; no, I did not seek any resources; no, I was not aware of any resources; no, I did not have access to any resources. Lastly, demographics were measured by asking for the respondent's gender identity, age, Hispanic/Latino origin, race, marital status, employment status, and disability diagnosis.

Table 1.1: Dependent and Independent Variable Survey Questions and Scales Analyzed

Dependent Variable	Questions	Scale
Wildfire Impact	3.)To what degree, if at all, was your life impacted by the recent California wildfires such as the Thomas and/or Woolsey fires in 2017 and/or 2018?	Not impacted at all=0; Somewhat impacted =1; Slightly impacted =2; Very impacted=3
	4.)Were you evacuated due to the following fires? (Thomas fire 2017, Woolsey fire 2018, Both, Neither)	Neither = 0; Thomas = 1; Woolsey = 2; Both = 3 Other = 4
	6.)During the fire(s) did you miss out on any of the following activities? (Select all that apply) (School, Work, Day Program, Other, None of the above)	Did not miss = 0; 1=Multiple missed activities.
	7.)During the fire(s) was your income impacted in any of the following ways? (Select all that apply) (Missed work, Lost Job, Lost/damaged home/property, Increased travel, Increased medical expenses, Other, No, my income was not impacted)	Not impacted financially = 0; Impacted Financially = 1
	8.)Before the fire(s) did you struggle with anxiety or depression? (Yes, No, Not sure)	Yes = 1; No/Not sure = 0
	9.)After the fire(s), did you experience an increase in any of the following symptoms as a result of the fire(s)? (Select all that apply) (Panic attacks, Worrying/anxiety, Depression, Social Isolation, Stress, Insomnia, Nightmares, Aggression, Other, No, I did not experience an increase)	(No=0; Yes=1;)
		Analysis Scale: Number of Symptoms Scale = 0-5
	15.) During the fire(s), were you impacted by a loss of any of the following? (Select all that apply) (Power, Clean air, Clean water, Food, Other, No, I was not impacted in this way) (0-6 scale)	Number Loss Experience = 0-5 Scale
30.) Is there anything you would like us to know about your overall experience with the wildfire(s)?	Text Response	
Independent Variable	Questions	
Use of Resources	11.)Did you seek counseling or other social resources to cope with the aftermath of the fire(s)? (select all that apply) (Yes, sought counseling resources, Yes, sought social resources, No, I did not seek any resources, No, I was not aware of any resources, No, I did not have access to any resources)	Yes = 1; No = 0
Knowledge of Resources	13.)Before the wildfire, were you aware of any of the following wildfire resources to stay informed and get help if needed?(Select all that apply) (Ready Ventura County, Ready Santa Barbara County, American Red Cross, FEMA, SAMHSA Disaster Distress Line, Smart 911, None of the above)	No Known Resources = 0; Number of Known Resources = 1-4 Scale
Social Trust	18.) Generally speaking, would you say that most people can be trusted or that you can't be too careful dealing with people? (People can be	Each question was totaled from 1-5 (Likert Scale) and the questions were

	<p>trusted, You can't be too careful)</p> <p>19.) How much do you trust local government officials? (A great deal - Not at all)</p> <p>20.) In general, do you agree or disagree with the following statement? Most people in my neighborhood are willing to help if I need it (Strongly agree – Strongly disagree)</p> <p>21.) In general, do you agree or disagree with the following statement? In my neighborhood, one has to be alert or someone is likely to take advantage of you (Strongly agree – Strongly disagree)</p> <p>22.) If a community project does not directly benefit you but has benefits for many others in the neighborhood would you contribute time or money to the project? (Will not contribute time, will contribute time, will not contribute money, will contribute money)</p>	<p>collapsed into a social trust scale used in the analysis. (Grootaert et al. 2014)</p>
Demographics	23.) Which term do you use to describe your gender identity?	Male = 1; Female/Other = 0
	24.) Age?	18-24=1; 25-34 =2; 35-44=3; 45-64=4; 65-74=5
	25.) What is your marital status?	Married/ Committed Relationship = 0; Single =1
	26.) Please answer both of the following questions about Hispanic origin and race. Are you of Hispanic, Latino or Spanish origin?	Yes = 1; No = 0
	27.) What is your race? Check all that apply	White = 0; Non-White = 1
	28.) What is your employment status?	Full time = 1; Part time=2; Unemployed-not looking =3; Student =4; Social Security (SSI) =5
	29.) Please specify if you are diagnosed with any of the following developmental disabilities? (Autism Spectrum Disorder, Down Syndrome, Attention Deficit Disorder, Fetal Alcohol Syndrome, Fragile X Syndrome, Intellectual Disability, Cerebral Palsy, Other.)	Single Scales for Analysis: ASD = 1; No ASD = 0 ID=1; No ID = 0 Cerebral Palsy = 1; No Cerebral Palsy = 0.

Survey Distribution and Data Collection

Prior to distributing the survey to the agencies, organizations, and community groups, I applied for Institutional Review Board (IRB) approval to conduct this research. In the application process I included the survey recruitment language that would be used on both the invitation for participants to participate (Appendix C) and the language used in asking for recruitment assistance (Appendix B). This included information on what the survey was about, what the

results would be used for, and its significance. Upon IRB approval it was required that each organization, community group and agency that agreed to assist with recruitment would send an approval letter indicating that they agreed to assist (Appendix F). I shared the survey invitation/flyer that included the survey link and QR code with the person tasked with distributing the invitation via social media (Facebook and Instagram) and email/communication flyers. The survey was open and distribution began on June 9, 2021 (Appendix A and B).

In order to reach as many participants as possible I continued to contact known agencies, community groups, and agencies who may be interested in assisting with survey recruitment. In this process, five more agreed to distribute the survey and an Amendment with an approval letter from each was required for the IRB. This continued until January 18, 2022 when the survey closed. During this time, three social service organizations asked if I could join some of their community group virtual meetings (Zoom) to invite participants to take the survey, give information about what the survey asks, and to answer questions. IRB approval was granted for this form of recruitment, and an approved script was used during each meeting (Appendix E). What was discovered in this process was that after each meeting I attended the survey response rate increased significantly in comparison to each time the survey was distributed via social media or email/communication flyers.

The recruitment invitations to participate in the survey shared on social media and email communication/flyers offered an introduction to the research and my role as a graduate student and former residency in Ventura, CA (Appendix C). The requirements for participation in the survey were that respondents lived in Ventura or Santa Barbara Counties in 2017 or 2018 during the Thomas and/or Woolsey fires, were adults (over age 18), and diagnosed with a developmental disability (ASD, Down Syndrome, ADD, Fetal Alcohol Syndrome, Fragile X

Syndrome, Intellectual Disability, Cerebral Palsy, or Epilepsy). No other exclusions based on race, ethnicity, class, or gender identity.

Once respondents were able to click the link to the survey, they were prompted to read a set of instructions and details about the survey to ensure informed consent. At this point the respondents were also able to choose the Spanish version of the survey offered by clicking on a dropdown menu to select the language. The instructions mentioned that responses are confidential, participation is voluntary, and respondents can skip any question that may make them uncomfortable or stop answering questions at any time due to the sensitive nature of the topic. The instructions mention that the survey follows the ethical standards of the American Sociological Association and the University of Montana (Appendix A and B).

Data Analysis

The survey remained open until January 18th, 2022 due to a lower response rate than expected (n=48). In total, 48 people opened and consented to being part of the survey, however, 38 people actually responded to survey questions that were used in the analysis. Once the survey was closed, I exported the Qualtrics survey data into Statistical Package for the Social Sciences (SPSS) for analysis. In the first part of this study, I used two analytical techniques to test the five hypotheses. First, I ran a chi-square test (Gold et al. 2020) to test the significance between the dependent and independent variables based on each hypothesis (H1, H2, H3, H4, H5).

Second, I utilized a correlation coefficient (Gold et al. 2020) to measure the relationship between two variables (interval-ratio) to calculate the direction and strength. This part of the analysis was useful in helping to answer specific parts of four hypotheses that pertained to a change in routine and financial impact (H2), mental health symptoms and social trust (H3), knowledge of resources and social trust (H4), and levels of basic needs, mental and financial

impacts, and knowledge of/use of services (H5). Additionally, this method was utilized to test for any significant relationships between the independent variables not included in the hypotheses or plausible impactful variables (demographics, social capital, and use of resources) and the dependent variables (loss of income, loss of basic needs, mental health symptoms, and daily routine).

Further analysis included two separate methods, one was to analyze and categorize the open-ended question responses that asked for respondents to share any further information about their experiences (H1, H4), and the second was to analyze the descriptive statistics. I ran a frequency distribution to analyze the descriptive statistics based on the demographic questions. This included information on the respondent's location based on what county they resided in, what wildfire(s) they were impacted by, and other characteristics based on race, ethnicity, employment status, gender identity, marital status, age, and disability status.

RESULTS

There was a total of 38 survey responses used in the dataset that have been organized into two parts of the results section. The first part is the descriptive statistics which describes information pertaining to the demographic results. The second part of this section explains the statistical analysis results of the five hypotheses including an analysis of the eight open-ended text responses.

Descriptive

This section will explain the demographic characteristics of the respondents in this (Table 1.2). Further statistical analysis results using the Pearson chi-square (Table 1.3 and 1.4) and correlation coefficient (Table 2.2) will be utilized to explain aspects of the demographic results as they pertain to wildfire impact not addressed in the *hypothesis results*.

Table 1.2: Demographic Characteristics of Respondents Impacted by Wildfire (N=38)

Characteristic	Frequency	Percent (%)
County		
Ventura County	31	81.58%
Santa Barbara County	7	18.42%
Wildfire(s)		
Thomas Fire	17	48.57%
Woolsey Fire	4	11.43%
Both	2	5.71%
Neither	9	25.71%
Other	3	8.57%
Gender Identity		
Male	15	55.56%
Female	10	37.04%
Other	1	3.7%
Age		
18-24	1	3.7%
24-34	11	40.74%
35-44	2	7.41%
45-54	7	25.93%
54-64	5	18.52%
65-74	1	3.7%
Marital Status		
Married	3	11.11%
Divorced	2	7.41%
Committed Relationship	1	3.70%
Single (never marries)	21	77.78%
Employment Status		
Full Time	5	19.23%
Part Time	8	30.77%
Unemployed - Not Looking	6	23.08%
Student	1	3.85%
Social Security (SSI)	6	23.08%
Race		
White	18	75%
Asian	2	8.33%
Other	4	16.67%
Ethnicity		
Hispanic	7	26.92%
Non-Hispanic	19	73.08%
Developmental Disability		
Autism Spectrum Disorder	6	20%
Attention Deficit Disorder	1	3.33%
Intellectual Disability	12	40%
Cerebral Palsy	4	13.33%
Other	4	13.33%

Table 1.2 reveals demographic information about survey participants impacted by the 2017 Thomas Fire and/or 2018 Woolsey Fire including location (county), age, race, gender identity, employment status, marital status, and developmental disability diagnosis. Not all options included in the survey were selected by respondents and are therefore omitted from table 1.2. In terms of location, approximately eighty percent (81.58%) lived in Ventura County and twenty percent (18.42%) lived in Santa Barbara County. Based on location, the respondents indicated that the majority of them were impacted by the 2017 Thomas Fire (48.57%), whereas 11.43% of respondents were impacted by the 2018 Woolsey Fire, 5.71% were impacted by both the Thomas and Woolsey Fires, 25.71% were not impacted by either wildfire, and 8.57% selected “other” as their response. Those who selected “other” were offered a text entry asking them to “please specify below,” in which the respondents wrote “Hill Fire 2018 (ventura county)”, “No”, and “Spring fire.”

Regarding gender identity, most respondents were male (55.56%), 37.04% were female, and 3.7% of respondents selected “other” and responded with “Pansexual.” Next, there was a somewhat wide age distribution for respondents with the majority between the ages of 24-34 years old (40.74%), 25.93% of respondents between 45-54 years old, 18.52% of respondents between 54-64 years old, 7.41% between 35-44 years old, 3.7% between 18-25, and 3.7% over 65 years old. Most respondents were single (never married) at 77.78%, 11.11% were married, 7.41% were divorced, and the remaining 3.70% selected “other” where they were able to give a text response in which they indicated “committed relationship.”

Regarding employment status, the results indicated a somewhat wide employment distribution with 30.77% being employed part time, 23.08% of respondents were unemployed – not looking for work, 23.8% of respondents receive Social Security (SSI) benefits, 19.23% of

respondents were employed full time, and 3.85% of respondents indicated they were students. The race and Hispanic/Latino origin results indicated that the sample was not as diverse as expected with most respondents being White (75%), 8.33% of respondents were Asian, and 16.67% of respondents selected “other” but did not write in the text entry when prompted to “please specify below.” Furthermore, 26.92% of respondents were Hispanic/Latino origin, and 73.08% were non-Hispanic/non-Latino origin.

Finally, of the options offered to answer the developmental disability diagnosis question, 40% of respondents were diagnosed with an Intellectual Disability (ID), 20% of respondents were diagnosed with Autism Spectrum Disorder (ASD), and 13.33% of respondents were diagnosed with Cerebral Palsy. The remainder indicated that they were diagnosed with Attention Deficit Disorder (ADD) (3.33%), and 13.33% of respondents selected “other” and specified that they were diagnosed with “Epilepsy” (2), “Rare disease” (1), and “N/A” (1). Various aspects of this table will be discussed in the analysis of the hypotheses using the correlation coefficient that will test the relationship between two variables.

Further statistical analysis was completed to determine if there was any significant relationships between the demographic characteristics of respondents and wildfire impact. First, an analysis of the Pearson chi-square tested the relationship between race and evacuation status and Hispanic or Latino origin and evacuation status. The results indicated that there was a relationship between being evacuated and being non-white, meaning that 71.4% of respondents who were evacuated due to a wildfire were non-white (Table 1.3). Next, similar results indicated that there was a relationship between being evacuated and being of Hispanic or Latino origin, meaning that 87.5% of respondents who were evacuated due to a wildfire were of Hispanic or

Latino origin. However, although there is an observed relationship, the Pearson chi-square does not show any significance in either Table 1.3 ($\chi^2=1.429$) or Table 1.4 ($\chi^2=3.255$).

Table 1.3: Evacuation Status by Race

	Evacuated	Not Evacuated
White	28.6%	87.5%
Non-White	71.4%	12.5%
Total	100%	100%
Pearson Chi-Square = 1.429		

Table 1.4: Evacuation Status by Hispanic/Latino Origin

	Evacuated	Not Evacuated
Hispanic or Latino	87.5%	26.7%
Non-Hispanic	12.5%	73.3%
Total	100%	100%
Pearson Chi-Square = 3.255		

Additional statistical analysis utilized a correlation coefficient to test the relationship between two variables. In particular, demographic characteristics that were notable in the descriptive results such as disability diagnosis frequency, county (location), and gender identity were added to the correlation matrix (Table 2.2) to compare them to other variables in the model (social trust and wildfire impacts). Results indicate that those diagnosed with ASD were significantly ($r = .458, p < .05$) more likely to experience a loss of basic needs (loss of power, loss of clean air, loss of clean water, loss of food). Next, results also indicated that people diagnosed with ID were significantly more likely to live in Santa Barbara County ($r=.482, p < .05$). Results also indicate that respondents living in Santa Barbara County had higher levels of social trust compared to Ventura County and approached statistical significance ($r = .295, p = .07$). Finally, one non-significant relationship that was observed but worth mentioning was that males were more likely to have lower levels of social trust ($r= -.041$).

Hypothesis

This section of the results reveals the findings regarding the statistical tests and open-ended text response analysis of the five hypotheses.

H1: Individuals with developmental disabilities who are at a greater risk mentally prior to a wildfire disaster, will be at greater risk of an increase in symptoms during and after a wildfire when they are directly exposed.

The first hypothesis used the Pearson chi-square to test the relationship between mental health experience before the wildfire and wildfire impact (Table 1.5) in comparison to an increase in mental health symptoms after a wildfire and wildfire impact (Table 1.6). The results indicate that individuals who struggled with mental health before the wildfire experienced an increase in mental health symptoms after experiencing a wildfire impact. For instance, of the respondents that indicated that they experienced mental health symptoms prior to a wildfire, there was a relationship between being “very impacted” by a wildfire and an increase in mental health symptoms. However, the Pearson chi-square only approached significance in Table 1.5 ($\chi^2 = .58$), and did not show any significance in Table 1.6 ($\chi^2 = 3.02$).

Table 1.5: Mental Health Experience Before Wildfire Impact

	Yes	No
Not Impacted	0%	0%
Slightly Impacted	25%	33.3%
Somewhat Impacted	62.5%	46.7%
Very Impacted	12.5%	20%
Total	100%	100%
Pearson Chi-Square=.58		

Table 1.6: Increase in Mental Health Symptoms After Wildfire Impact

	Yes	No
Not Impacted	0%	0%
Slightly Impacted	26.7%	44.4%
Somewhat Impacted	46.7%	55.6%
Very Impacted	26.7%	0%
Total	100%	100%
Pearson Chi-Square=3.02		

Table 1.7 describes the relationship between an increase in mental health symptoms and evacuation status. This test helps to further address the first hypotheses that mental health

experiences will put them at greater risk for an increase in symptoms when exposed to a wildfire by not only testing for impact in general, but by seeking to understand if being evacuated (a significant impact) will influence their mental health symptoms. The results indicate that 80% of respondents who were evacuated experienced an increase in mental health symptoms. Similarly to the results in tables 1.5 and 1.6, the Pearson chi-square test does not show anything statistically significant ($\chi^2=1.63$).

Table 1.7: Increase in Mental Health Symptoms After Evacuation

	Yes	No
Not Evacuated	20%	44.4%
Evacuated	80%	55.6%
Total	100%	100%
Pearson Chi-Square=1.63		

In answering this question (H1), an analysis of the open-ended responses asking respondents if they wanted to share anything else about their experiences with the wildfire(s) revealed a theme that pertains to wildfire exposure and mental health symptoms/experiences. For example, one open ended response revealed “I had to find resource tools to not focus on dwelling on the fire.” Additionally, a similar theme arose when I attended virtual (Zoom) meetings to invite participants to take the survey. In the question portion of each meeting participants at day programs and independent living organized gatherings, possible respondents to the survey had comments to share with me rather than questions. A common comment was that they continued to struggle with anxiety and worry related to their experience as well as fear about the future in terms of wildfire preparedness.

H2: Individuals with developmental disabilities who were impacted by a change in their daily routine due to the wildfire will have an increase in mental health symptoms and experience a financial impact.

To analyze the second hypothesis the Person chi-square was used to test the relationship between a change in respondents daily routine (multiple missed activities) and an increase in mental health symptoms. Table 1.8 reveals that there is a relationship between a change in routine and an increase in mental health symptoms that is statistically significant ($\chi^2 = 38.47$, $p < .001$).

Table 1.8: Number of Increase in Symptoms After Change in Routine (Multiple Missed Activities)

	0	1	2	3	4	5
No Change in Routine	88.9%	85.7%	75%	100%	100%	100%
Change in Routine	11.1%	14.3%	25%	0%	0%	0%
Total	100%	100%	100%	100%	100%	100%
Pearson Chi-Square=38.47						
***p<.001						

Furthermore, another aspect of this hypothesis was analyzed using the Person chi-square that tested the relationship between mental health experiences before the wildfire and financial impact (Table 1.9). What was found was that respondents who struggled with mental health before the wildfire experienced a greater financial impact than those who did not struggle with mental health before the wildfire. The Pearson chi-square test indicated that the relationship between mental health experience before the wildfire and a financial impact after the fire approached significance ($\chi^2 = 3.63$, $p = .057$).

Table 1.9: Mental Health Experience Before and Financial Impact

	Financial Impact	No Financial Impact
Mental Health Before	54.5%	16.7%
No Mental Health Before	45.5%	83.3%
Total	100%	100%
Pearson Chi-Square =3.63 (p=.057)		

Lastly, in analyzing the correlation coefficient to test the relationship between two variables (testing direction and strength), the correlation matrix (Table 2.2) revealed that there was a significant ($r = .411$, $p < .05$) relationship between a change in routine (multiple missed activities) and a financial impact.

H3: Individuals with developmental disabilities who were impacted financially and mentally will have lower levels of social trust.

In analyzing the results for the third hypothesis, the correlation coefficient (Table 2.2) revealed that there was a relationship between an increase in mental health symptoms and social trust. Meaning that as mental health symptoms increased, levels of social trust decreased, but was not significant ($r = -.074$).

H4: Individuals with developmental disabilities who did not have knowledge of adequate resources for preparedness and assistance before, during, and after the fire will have lower levels of social trust.

The fourth hypothesis revealed that the most significant finding pertained to expressions of a lack of knowledge or access to disaster resources impacted respondents attitudes toward local/state/government officials (social trust). More specifically, in answering this hypothesis (H4) the analysis of the open-ended responses to question 29 (“is there anything you would like us to know about your overall experience with the wildfire?”) revealed a pattern between a lack of wildfire preparedness and knowledge of resources that indicated observed patterns in lower levels of social trust in government resources during the crisis. For example, respondents stated things such as:

“Service providers are not well prepared to relocate people at a second notice”

“Lack of resources from govt/Emerg Serv for disabled”

“Our house was full of ash from the Thomas fire. We had to claim insurance for that and did receive a check.”

“Can be stressful and if not prepared with go bag it's depressing to leave important momentous”

H5: Individuals with developmental disabilities who were impacted mentally and/or financially due to the fire, will have an increased risk of not having access to adequate resources for preparedness and assistance before, during, and after the fire.

The fifth hypotheses used the Pearson chi-square to test the relationship between mental health and financial impacts after the wildfire and access to resources after the fire. One relationship was found regarding an increase in mental health symptoms and seeking counseling/social resources to cope. Table 2.1 reveals that based on the actual responses to experiencing an increase in symptoms and seeking counseling/social resources, the majority of respondents who experienced an increase in symptoms said that they did not seek or that they did not have access to counseling/social resources. Although there is an observed relationship, the Pearson chi-square does not show any significant relationship ($\chi^2 = 2.97$).

Table 2.1: Increase in Symptoms and Seeking Counseling/Social Resources

	Yes	No, I Did Not Seek	No, No Access
No Increase	0%	35.7%	44.4%
Increase	100%	64.3%	42.9%
Total	100%	100%	100%
Pearson Chi-Square=2.97			

In attempting to further answer this question (H5) the correlation coefficient (Table 1.9) revealed that as a loss of basic needs (loss of power, loss of clean air, loss of access to clean water, and loss of food) increased, the number of mental health symptoms increased. This was

statistically significant relationship ($r = .617, p < .01$), meaning that as individuals struggled with accessing and maintaining their basic needs, their mental health symptoms increased.

Table 2.2: Correlation Matrix

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1 Social Trust	1													
2 Financial Impact	.037	1												
3 Increase in Symptoms	-.074	.073	1											
4 Change in Routine	-.030	.411*	-.083	1										
5 Santa Barbara	.295	-.038	-.201	.229	1									
6 Knowledge of Resources	-.254	.068	.178	-.034	.129	1								
7 Relationship Status	.216	-.128	-.086	.204	.282	-.314	1							
8 White/Non White	.059	-.085	-.205	-.181	.178	.346	-.178	1						
9 Feel need for therapy	.137	-.451*	-.318	-.017	-.060	.059	.081	.150	1					
10 Loss of power/clean air, etc.	-.034	.303	.617**	-.212	-.329	.025	-.314	-.236	-.707**	1				
11 ASD Diagnosis	-.309	.339	.358	-.204	-.127	-.096	-.196	-.313	-.301	.458*	1			
12 ID Diagnosis	-.019	-.313	-.197	.181	.482*	-.163	.256	.225	.048	-.387	-.324	1		
13 Cerebral Palsy Diagnosis	.237	-.210	-.325	-.178	-.259	.047	-.062	.036	.312	-.134	-.234	-.181	1	
14 Male	-.041	-.214	-.030	.079	.019	-.124	.149	.000	.044	.074	-.085	.168	.149	1

* $p < .05$; ** $p < .01$; *** $p < .001$

DISCUSSION AND CONCLUSION

Significant points from the results section will be discussed and possible explanations for why these results occurred will be explored in this section. First, the descriptive results and the related correlation coefficient statistics (Table 2.2) may offer an explanation of the demographic results including where individuals with disabilities live and how they were impacted. The

second section will offer explanations regarding whether the results support each hypothesis. To conclude, the final two sections explore the study limitations, future research suggestions, and the contributions to sociological research.

Descriptive Results

The explanation of the demographic results in the study were explored to determine who took the survey and if any relationship between wildfire impact and the respondents demographic characteristics were observed. What was notable in the results that could be used to generate plausible arguments for generalizability if the study sample size was larger, was that the respondent's location (county) and wildfire experience match what was expected of the results based on the county demographics (U.S. Census Bureau 2021 a,b). For instance, based on the higher population size for Ventura County (839,784 people), it makes sense that approximately 81.58% of respondents indicated that they lived there. In addition, the results also indicated that the county that experienced the greatest wildfire impact was Ventura County. With 48.57% experiencing the Thomas Fire, 25.71% experiencing both the Thomas and Woolsey Fires. These results indicate that Ventura County was impacted more than Santa Barbara County, and can be explained by the fact that Santa Barbara only experienced one recent significant wildfire event within the 2017/2018 wildfire season ("Thomas Fire" 2022).

Relating the results back to the discussion of individuals with developmental disabilities with regard to the Capabilities Framework, the demographic results indicate that the respondents in the survey match what is expected for an adult in this population who may be living as a single individual either as a dependent (living with parent or guardian), or independently while working part time and/or utilizing their Social Security Income (SSI) benefits for income (Disability Justice 2021; CDC 2020). The results indicated that this was observed with 77.78%

of respondents being single (never married), 30.77% being employed part time, 23.08% being unemployed – not looking for work, and 23.8% of respondents receiving Social Security Income (SSI) benefits.

When the demographic results were analyzed to determine statistical significance, the Pearson chi-square results indicated that there was an observed relationship between being evacuated and being non-white, with 71.4% of respondents who were evacuated due to a wildfire being non-white (Table 1.3), and 87.5% of respondents who were evacuated due to a wildfire being of Hispanic or Latino origin (Table 1.4). If the Person chi-square would have shown significance (recall Table 1.3 ($\chi^2=1.429$) and Table 1.4 ($\chi^2=3.255$), this relationship would have been alarming and regarded as a form of environmental injustice (Bullard 2008). It should be noted that a possible consequence of this finding in the current analysis is due to a lack of statistical power caused by the small sample size (i.e. type II error or false negative) (Lieber 1990). Meaning, if this was found, this population likely experienced unequal forms of environmental “bads” (i.e. wildfire impacts - evacuation) because they were evacuated at a higher rate than their non-Hispanic/Latino, white counterparts.

The correlation coefficient results analyzed revealed a number of observed relationships between notable variables. First, the correlation matrix shows us that respondents diagnosed with ASD were significantly ($r = .458, p<.05$) more likely to experience a loss of basic needs (loss of power, loss of clean air, loss of clean water, loss of food). While the hypothesis did not predict any differences between disability diagnosis status, this result indicates that it is plausible that the type of developmental disability diagnosis may play a role in predicting individual impact from a wildfire.

Next, results in Table 2.2 also indicated that people diagnosed with ID were significantly ($r=.482$, $p<.05$) more likely to live in Santa Barbara County. This can be tied to the location (county) results showing that respondents living in Santa Barbara County had higher (approached significance $r = .295$, $p = .07$) levels of social trust compared to Ventura County. This finding reveals differences in location and population size between the two counties that have relatively similar median household incomes and poverty rates (U.S. Census Bureau 2021a,b). In addition, the results in Table 2.2 also lead to further questions in terms of needing explanations as to why an ID diagnosis and higher levels of social trust was observed at higher frequencies in Santa Barbara County, but higher levels of social trust was not significant for individuals with an ID diagnosis. This is likely explained by the lower sample size in this study.

Hypothesis Results

Throughout this section, the hypothesis results will be discussed by stating whether the hypothesis are supported by the results. While some hypotheses do show support based on the results, the sample size continues to wage caution in generalizing or determining significance. Based on the Pearson chi-square tests, the results do not support H1, which stated that individuals with developmental disabilities who are at a greater risk mentally prior to a wildfire disaster, will be at greater risk of an increase in symptoms during and after a wildfire when they are directly exposed. In analyzing the Pearson chi-square, the results indicate that individuals who struggled with mental health before the wildfire experienced an increase in mental health symptoms after experiencing a wildfire impact. More specifically, of the respondents that indicated that they experienced mental health symptoms prior to a wildfire, there was a relationship between being “very impacted” by a wildfire and an increase in mental health

symptoms. However, the Pearson chi-square only approached significance in Table 1.5 ($\chi^2 = .58$) and did not show any significance in Table 1.6 ($\chi^2 = 3.02$).

Additional Person chi-square tests (Table 1.7) described the relationship between an increase in mental health symptoms and evacuation status. The results show that 80% of respondents who were evacuated experienced an increase in mental health symptoms. However, like the results in tables 1.5 and 1.6, the Pearson chi-square test does not show anything statistically significant ($\chi^2 = 1.63$), meaning that although a relationship is observed these results do not indicate that that H1 is supported based on significance.

Based on an analysis of the open-ended responses, the results provide evidence that does support H1, which stated that individuals with developmental disabilities who are at a greater risk mentally prior to a wildfire disaster, will be at greater risk of an increase in symptoms during and after a wildfire when they are directly exposed. The open-ended text response revealed a theme regarding wildfire exposure and mental health symptoms/experiences. These open-ended response themes included expressions of struggles with mental health due to the wildfire, such as: "I had to find resource tools to not focus on dwelling on the fire." Additionally, as noted in the results a similar theme arose when I attended virtual (Zoom) meetings to invite participants to take the survey in which a common comment was that individuals with developmental disabilities continued to struggle with anxiety and worry related to their experience as well as fear about the future in terms of wildfire preparedness. This theme provides support for H1, in which individuals with developmental disabilities who were at a greater risk mentally prior to a wildfire disaster, were at greater risk of an increase in symptoms during and after a wildfire.

Based on some of the Pearson chi-square tests, the results do support H2, which stated that individuals with developmental disabilities who were impacted by a change in their daily

routine due to the wildfire will have an increase in mental health symptoms and experience a financial impact. First, the Person chi-square was used to test the relationship between a change in respondents daily routine (multiple missed activities) and an increase in mental health symptoms. Table 1.8 reveals that there is a relationship between a change in routine and an increase in mental health symptoms that was statistically significant ($\chi^2 = 38.47, p < .001$). Meaning that as individuals with developmental disabilities struggled with a change in their routine (missed work, missed school, missed day program, and other activities), they experienced an increase in mental health symptoms (worry, anxiety, depression, stress, nightmares, etc.).

Furthermore, another aspect of this hypothesis was analyzed using the Person chi-square that tested the relationship between mental health experiences before the wildfire and financial impact (Table 1.9). The results indicate that respondents who struggled with mental health before the wildfire experienced a greater financial impact than those who did not struggle with mental health before the wildfire. This result does support H2, which stated that individuals with developmental disabilities who were impacted by a change in their daily routine due to the wildfire will have an increase in mental health symptoms and experience a financial impact. The Pearson chi-square test indicated that the relationship between mental health experience before the wildfire and a financial impact after the fire approached significance ($\chi^2 = 3.63, p = .057$), thus providing support for H2.

Next, a Person chi-square test revealed that respondents who struggled with mental health before the wildfire experienced a greater financial impact than those who did not struggle with mental health before the wildfire. The Pearson chi-square test does support H2, which was indicated by the relationship between mental health experience before the wildfire and a financial impact after the fire approaching significance ($\chi^2 = 3.63, p = .057$).

The correlation coefficient results do provide further support for H2. This was observed in the correlation matrix (Table 2.2) which revealed that there was a significant ($r = .411, p < .05$) relationship between a change in routine (multiple missed activities) and a financial impact. With this evidence and the Person chi-square significance, results indicate that individuals with developmental disabilities who were impacted by a change in their daily routine due to the wildfire, experienced a financial impact, and experienced an increase in mental health symptoms.

Based on an analysis of the correlation coefficient, the results do not support H3, which stated that individuals with developmental disabilities who were impacted financially and mentally will have lower levels of social trust. To exemplify, the analysis of the correlation (Table 2.2) revealed that there was a relationship between an increase in mental health symptoms and social trust. Meaning that as mental health symptoms increased, levels of social trust decreased. However, this relationship was not significant ($r = -.074$), thus the results cannot support H3.

Based on an analysis of the open-ended question responses, the results do support H4, which stated that individuals with developmental disabilities who did not have knowledge of adequate resources for preparedness and assistance before, during, and after the fire will have lower levels of social trust. In answering this hypothesis (H4), the analysis of the open-ended responses to question 29 (“is there anything you would like us to know about your overall experience with the wildfire?”) revealed a pattern between a lack of wildfire preparedness and knowledge of resources that indicated observed patterns in lower levels of social trust in government resources during the crisis. Therefore, this theme indicates a pattern of a lack of trust in government resources during crisis that is influenced by the lack of resources tailored to this

population, providing evidence that supports H4. Statements of supported evidence for H4 include:

“Service providers are not well prepared to relocate people at a second notice”

“Lack of resources from govt/Emerg Serv for disabled”

“Our house was full of ash from the Thomas fire. We had to claim insurance for that and did receive a check.”

“Can be stressful and if not prepared with go bag it's depressing to leave important momentous”

Furthermore, based on an analysis of the Person chi-square, the results do not support H5, which stated that individuals with developmental disabilities who were impacted mentally and/or financially due to the fire, will have an increased risk of not having access to adequate resources for preparedness and assistance before, during, and after the fire. The Pearson chi-square reveals that based on the actual responses to experiencing an increase in symptoms and seeking counseling/social resources, most respondents who experienced an increase in symptoms said that they did not seek or that they did not have access to counseling/social resources (Table 2.1). However, although there is an observed relationship, the Pearson chi-square did not show any significant relationship ($\chi^2 = 2.97$), thus H5 is not supported.

The discussion hypothesis results (whether they were supported or not) give cause for further discussions on future research and sociological implications especially in terms of the mental health impacts and levels of social trust that will be discussed in the *research significance and implications* section below.

Study Limitations

This study may lend to some plausible policy changes and contribute further discussion and contributions to social science, developmental disability research, and disaster research. However, due to the low response rate (N=38) this study does have limitations. Most notably, the low response rate does wage caution in the study's ability to generalize to the population being analyzed.

In considering the lower response rate, this outcome may have occurred due to several plausible explanations. What was originally thought to improve the response rate by providing a Spanish version of the survey and a mail-in survey option, turned out to be ineffective. In that, neither method was utilized or requested by survey respondents. However, referring to the conceptual framework used, the Capabilities Framework (Emerson and Hatton 2014; Nussbaum 2011; Nussbaum and Sen 1993) might aid in understating why a lower than expected response rate occurred. For instance, aspects of the survey may have been in-accessible to some individuals who may not have the assistance required to take the survey – parent/guardian/advocate, in addition to utilizing social media or the technology that was required to take the survey (smart phone, computer, mail-in). Furthermore, some individuals may be part of the social service agencies but do not stay informed on the organizations through the methods to which the survey recruitment was distributed. More so, not all individuals with developmental disabilities are part of social service agencies or involved in the community groups that were contacted.

Next, another part of the conceptual framework utilized in this study was Social Capital (Bourdieu 1986). In using this framework, consider certain features of Social Capital, or levels of social trust for this population - or the population in general. For example, levels of trust in

surveys and organizations may limit the effectiveness in using surveys as a form of capturing a desired sample size. For instance, some individuals in this population may use social media, are members of social service agencies or organizations, but may not follow the organizations on social media. Alternatively, if they do use social media, when they see a post for a survey, they may be hesitant to take it due to a lack of social trust in online surveys. Such that, individuals may fear that organizations may share their personal information.

Another plausible explanation for the low response rate involves attempting to survey this population during the COVID-19 Pandemic (2020-Present). It is possible that the methods used in the survey recruitment were not great in capturing a population that may be feeling the impacts of the Pandemic at higher rates (CDC 2022b). It could also be explained due to the state of overwhelming social media and news exposure, in addition to anecdotal evidence provided by advocates for this population stating (to me) that this population is currently being over surveyed on COVID-19 impacts.

Finally, the length of the survey (29 questions) and the time that it could have taken an individual to complete the survey (10-20 minutes), is no doubt a reasonable limitation to this study. However, likely limitations pertained more toward the length of the survey, the word count in the survey flyers, and the informed consent explanations (Appendix A, B, D). Evidence for this explanation was observed with the response rate increasing after virtual (Zoom) recruitment meetings took place. The simplification of the survey purpose and face-to-face personalized nature of this recruitment method likely increased an individual's understanding, trust, and desire to complete the survey.

Future Research

In the review of the previous disaster literature pertaining to this study, arguments have been made that call on the need for social science researchers to shift what (who) is studied in disaster research. For this research in particular, individuals with developmental disabilities were given an opportunity to inform us on their wildfire experiences by taking a survey. Conducting this study was unique in that it not only attempted to fill a gap in disaster research by surveying this population, but it was also unique in that typical disaster research on impacts are often qualitative (structured interviews) and are not always inclusive of everyone.

While it was thought that utilizing a survey was the best method to capture a larger sample size, it is clear this may have not been the most feasible method to reach that goal. Therefore, I would like to propose expanding on this research in the future to influence policy changes/decisions that include the voices of individuals with developmental disabilities in disaster preparedness and recovery.

This expansion would include incorporating two methods (qualitative and quantitative), in an effort to increase response rate and to expand on the survey questions analyzed. First, by strengthening the survey design and recruitment methods for quantitative analysis. This can be done by limiting the survey questions to location and demographic specific questions to save time. Next, including a qualitative component by conducting structured interviews to not only ask the questions already included in the survey (non-demographic), but to allow for more open-ended responses to each question to determine their level of impact, social capital (trust), and access to/use of resources.

It would also be beneficial to expand on some of the research questions (and hypothesis) by generating demographic questions that are intended to better understand wildfire impacts on

individuals with developmental disabilities by income, employment, and housing status (i.e. living independently, with parent, legal guardian, or in a group home/assisted living facility). Doing so would help to generate more useful information on the differences in demographic characteristics and wildfire impact.

Due to the lack of research in this area, it would be beneficial to incorporate these two methods into a longitudinal study that is tasked with surveying and interviewing individuals impacted by wildfires that do not currently exist. Meaning, in this methodology it would allow for myself (or other experts) to survey and interview individuals both during and after being impacted by a wildfire. This can be accomplished by meeting individuals where they are at in proximity to a wildfire, allowing for individuals with and without a developmental disability diagnosis to participate in the survey so comparisons can be made between and among individuals, in addition to comparing geographical location of wildfires (rural vs. urban).

In the methodological aspect of the suggested research, a notable feature that was missing from this study was offering an incentive to participants. Accomplishing this goal would require financial assistance and would only be possible in a theoretical PhD research study that could apply for funding, or through an organization (government or non-profit) that allowed its employees (researchers) to apply for grants, to name a couple ideas. However, it is suggested that if researchers want to study individuals impacted by wildfires and/or other disasters, incentives should be in the form of providing some form of disaster preparedness/recovery aid. Such as, disaster preparedness kits (American Red Cross 2022) to assist in their recovery.

Research Significance and Implications

The results of this study can be utilized to motivate improvements or future research regarding the mental health impacts and access to resources to improve services for vulnerable

groups impacted by disasters. Thus, the significance related to the observed increases in mental health symptoms, the open-ended results indicating lower levels of social capital (trust), the notable impact on their basic needs (power, water, air, food), and general wildfire impacts (evacuation status by race and Hispanic/Latino origin, financial impacts, and impacts on their daily routines), is significant enough to imply that changes should be discussed and addressed.

Relating the results back to the conceptual framework will be useful in this discussion. First, it can be inferred that even with the lower response rate the data does show that in utilizing the Capabilities Framework this population struggles with increased mental health symptoms and accessing services/resources when they are exposed to a wildfire event. This is significant because it is known that certain sets of this population, like individuals diagnosed with ID, experiences trauma differently and more frequently than those without ID (McGilvery 2018). Thus, in determining one's capabilities and analyzing of a person's quality of life as it pertains to wildfire exposure, recall how the capabilities framework asks not just about the total or average well-being of individuals, but consider the opportunities available to each person (Nussbaum 2011).

With that, it is argued that the population analyzed in this study is not able to meet its full capabilities and quality of life potential if individuals who are impacted by a wildfire experience an increase in mental health symptoms, financial impacts, impacts on their basic needs, and do not have access or knowledge of mental health or social services to cope. What is concerning based on these results is that the emerging research has already revealed that 25-50% of individuals in the general population who are exposed to an extreme weather disaster are at risk of adverse mental health impacts (NIHCM 2022). For instance, this recent research on how

climate change is affecting our mental health revealed that up to 54% of adults suffered from depression after a natural disaster (NIHCM 2022).

Considering the findings of this research regarding the increase in mental health symptoms and the relationship between wildfire preparedness/ knowledge of resources and lower levels of social trust in city/government officials, this indicates that more should be done to provide disaster preparedness and recovery aid that is inclusive to everyone. Additionally, due to the response rate related to the number of individuals who indicated that they did not have access to mental health or social services (Table 2.1), this indicates that local/city/government officials should provide disaster services that include mental health resources that are accessible.

Relating this back to environmental justice and the extensive research on recent disasters like Hurricane Katrina, the recent climate research on mental health and the general population also shows that 49% of Hurricane Katrina survivors developed an anxiety or mood disorder, and 1 in 6 developed PTSD (NIHCM 2022), providing evidence that possible policy and emergency planning changes based on wildfire (or disaster) impacts on individuals with developmental disabilities need significant improvements. In particular, emergency responses and recovery aid should include everyone in their reports (U.S. Government Accountability Office 2019), in addition to expanding on mental health and disaster recovery resources for all individuals impacted.

Second, the data also indicates that there is a relationship between geographic location and social trust, and the open- ended responses indicate that an individual's relationship with service providers may influences their Social Capital (trust) based on their noted struggles with disaster recovery resources. The results of this study assert that the social capital framework can be tied to the capabilities framework and environmental justice. Such that, based on the impacts

on the individual's quality-of-life (capabilities) due to wildfire exposure, their notable expressions of distrust in community organizations and resources relates to their levels of social trust, and therefore influenced how they were able to prepare, respond, and recover from a disaster. Therefore, improving the accessibility and inclusivity of disaster resources may help to improve levels of social trust.

Third, the data indicates a form of environmental injustice based on the wildfire impacts on their mental health and loss of basic needs, in addition to the notable demographic characteristic features pertaining to wildfire impact. It is clear that this population is at risk of experiencing an increase in mental health symptoms as well as impacts to their daily routine, financial impacts, and impacts on their basic needs (quality of life). Therefore, indicating a form of environmental injustice (Bullard 2008).

However, in the discussion of environmental justice the most concerning result of this study indicated that there was a relationship between being evacuated and being non-white, a finding that is worth further investigation. These results indicated that 71.4% of respondents who were evacuated due to a wildfire were non-white (Table 1.3), and that there was a relationship between being evacuated and being of Hispanic or Latino origin (87.5% of respondents) (Table 1.4). This finding is notable because if the sample size was larger and the results showed significance, the findings would warrant cause for significant improvements to disaster preparedness and recovery resources for individuals with developmental disabilities, with special attention to race and Hispanic/Latino origin factors.

Additionally, the findings regarding the relationship between being evacuated and being non-white and of Hispanic or Latino origin (Tables 1.3 and 1.4) echo what is already known in previous quantitative disaster research. In particular, the extensive amount of disaster research

(specifically hurricanes) shows heightened risks for vulnerable populations by race, class, and/or disabilities in general (Gaskin et al. 2017; Learning and Guha-Sapir 2013; Sauerborn and Ebi 2012; Weibgin 2015). Meaning, individuals with developmental disabilities may face similar risks in that they are doubly vulnerable to disaster impacts (by race and developmental disability status).

Lastly, as indicated by the described uniqueness of this study, the creation of the survey and the questions asked related to wildfire impact contribute a new analytical methodology that can be useful in conducting related studies in social science research, including disability and disaster research. Additionally, this research shows that the capabilities framework combined with social capital theory can provide a better analytical perspective for understanding the ways individuals with developmental disabilities experience environmental justice.

REFERENCES

- Abrams, Jesse B., Melanie Knapp, Travis B. Paveglio, Autumn Ellison, Cassandra Moseley, Max Nielsen-Pincus, and Matthew S. Carroll. 2015. "Re-envisioning Community-Wildfire Relations in the U.S. West as Adaptive Governance." *Ecology and Society* 20(3):34
- Access Living. 2019. "Independent Living History." Retrieved September 20, 2021 (<https://www.accessliving.org/newsroom/blog/independent-living-history/>).
- Administration for Community Living. 2022. "Centers for Independent Living." Retrieved January 5, 2022 (<https://acl.gov/programs/aging-and-disability-networks/centers-independent-living>).
- Americans With Disabilities Act of 1990, 42 U.S.C. § 12101 *et seq.* 1990. Retrieved April 5, 2021 (<https://www.ada.gov/pubs/adastatute08.htm>).
- American Red Cross 2022. "Deluxe 3-Day Emergency Preparedness Kit." Retrieved February 16, 2022 (<https://www.redcross.org/store/deluxe-3-day-emergency-preparedness-kit/91052.html?cgid=preparedness#start=6&cgid=preparedness>).
- Andone, Dakin. (2018). "The Largest Wildfire in California's modern History is Finally Out, More Than 6 Months After it Started." CNN. Retrieved April 5, 2021 (<https://www.cnn.com/2018/06/02/us/thomas-fire-officially-out>).
- Auditor of the State of California. 2019. *California Is Not Adequately Prepared to Protect Its Most Vulnerable Residents From Natural Disasters*. Emergency Planning, Report Number: 2019-103. Retrieved October 5, 2021 (<http://auditor.ca.gov/reports/2019-103/index.html>).

- Barnhill, Jarrett, Cooper, Sally-Ann, Fletcher, Robert J. 2016. *DM-ID-2: Diagnostic Manual, Intellectual Disability: A Textbook of Diagnosis of Mental Disorders in Persons with Intellectual Disability*. National Association for the Dually Diagnosed. NADD. ISBN: 9781572561342.
- Beck, Ulrich. 2006. "Living in the World Risk Society." *Economy and Society* 35(3): 329-45.
- Bourdieu, Pierre. 1986. *The forms of capital*. Handbook of Theory and Research for the Sociology of Education. Westport, CT: Greenwood: 241–58.
- Brunsmas, David L., David Overfelt, and J. Steven Picou. 2010. *The Sociology of Katrina: Perspectives on a Modern Catastrophe, 2nd ed*. Plymouth, UK: Rowman and Littlefield.
- Bullard, Robert D. 1996. "Symposium: The Legacy of American Apartheid and Environmental Racism." *St. Johns Journal of Legal Commentary* 9: 445-474.
- Bullard, Robert. D. 2008. "Differential Vulnerabilities: Environmental and Economic Inequality and Government Response to Unnatural Disasters." *Social Research* 75(3), 753–784.
- Carroll, Matthew and Travis Paveglio. 2019. "Local Community Agency and Vulnerability Influences on a Montana Wildfire." *Journal of Forestry*. 117:2-11.
- CAL FIRE. 2022. "Top 20 Largest California Wildfires." Retrieved April 20, 2022 (https://www.fire.ca.gov/media/4jandlhh/top20_acres.pdf)
- Centers for Disease Control and Prevention (CDC). 2022a. "Autism Spectrum Disorder (ASD)." Retrieved April 20, 2022 (<https://www.cdc.gov/ncbddd/autism/index.html>).
- Centers for Disease Control and Prevention (CDC). 2022b." COVID Data Tracker." Retrieved April 21, 2022 (<https://covid.cdc.gov/covid-data-tracker/#underlying-med-conditions>)
- Centers for Disease Control and Prevention (CDC). 2020. "Facts About Developmental

- Disabilities.” Retrieved April 1, 2021
(<https://www.cdc.gov/ncbddd/developmentaldisabilities/facts.html>).
- Center for Disaster Philanthropy (CDP). “2020 North American Wildfire Season.” Retrieved March 30, 2021 (<https://disasterphilanthropy.org/disaster/2020-california-wildfires/>)
- Channel Islands Social Services. 2020. “Home.” Retrieved October 24, 2020
(<https://www.islandsocialservices.org>).
- Decker, Curt, Resch, J. Aaron, Sharp, Amy N., Stough, Laura M., Wilker, Nachama. 2015. “Barriers to the Long-term Recovery of Individuals with Disabilities Following a Disaster.” *Wiley Online Library* 40(3):387-410 doi:2443/10.1111/disa.12161.
- DeJong, Gerben. 1979. “Independent Living: From Social Movement to Analytic Paradigm.” *Arch Phys Med Rehabil* 60(10):435-46 PMID: 496597.
- Disability Justice. 2022. “Disability Demographics and Definitions.” Retrieved November 25, 2021 (<https://disabilityjustice.org/justice-denied/disability-demographics/>).
- Emerson, Eric, and Hatton, Chris. 2013. *Health Inequalities and People with Intellectual Disabilities*. Cambridge: Cambridge University Press.
- Federal Emergency Management Agency (FEMA). 2019. *2019 National Preparedness Report*. U.S. Department of Homeland Security. Retrieved October 5, 2021
(https://www.fema.gov/sites/default/files/2020-03/fema_national-preparedness-report-2019.pdf).
- Gaskin, Cadeyrn J., Taylor, Davina, Kinnear, Susan, Mann, Julie, Hillman, Wendy, and Moran, Monica. 2017. "Factors Associated with the Climate Change Vulnerability and the Adaptive Capacity of People with Disability: A Systematic Review." *Weather, Climate, and Society* 9(4):801-14. doi:10.2307/26389006.

- Gershon, Robin R., Portacolone, Elena, Nwankwo, Ezinne M., Qureshi, Kristine A., Raceis, Victoria H. 2017. "Psychosocial Influences on Disaster Preparedness in San Francisco Recipients of Home Care." *Journal of Urban Health* 94:606-18
doi:2443/10.1007/s11524-016-0104-3.
- Gold, Howard J., Nancy Whittier, Tina Wildhagen. 2020. *Statistics for Social Understanding: With Stata and SPSS*. London, UK: Rowman and Littlefield.
- Grootaert, Christiaan, Deepa Narayan, Veronica N. Jones, and Michael Woolcock. 2004. *Measuring Social Capital: An Integrated Questionnaire*. Washington D.C.: The World Bank.
- Klinenberg, Eric. 2002. *Heat Wave: A Social Autopsy of Disaster in Chicago, 2nd ed.* University of Chicago Press.
- Kuehn, Robert. 2000. "A Taxonomy of Environmental Justice." *Environmental Law Reporter* 30:10681-10703.
- Learning, Jennifer, and Guha-Sapir, Debarati. 2013. "Natural Disasters, Armed Conflict, and Public Health." *New England Journal of Medicine* 369:836-1842.
doi:10.1056/NEJMra1109877.
- Lieber, Richard L. 1990. "Statistical Significance and Statistical Power in Hypothesis Testing." *Journal of Orthopedic Research* 9:304-309.
- Machalek, Richard, Michael W. Martin. 2015. "Sociobiology and Sociology: A New Synthesis." *International Encyclopedia of the Social & Behavioral Sciences* 2.
- McGilvery, Sharon. 2018. *The Identification and Treatment of Trauma in Individuals with Developmental Disabilities*. New York, NY: NADD Press.
- McGrough, Michael. 2020. "5 of the 6 largest California Wildfires in History Started the Past 6

- Weeks.” *The Sacramento Bee*, September 22. Retrieved October 25, 2020 (<https://www.sacbee.com/news/california/fires/article245917915.html>).
- Morris, Amanda. 2021. “We Didn’t Have a Plan’: Disabled People Struggle to Evacuate from Wildfires.” *New York Times*, September 15. Retrieved September 20, 2021 (<https://www.nytimes.com/2021/09/12/us/wildfires-disabled-people-evacuation.html?searchResultPosition=1>).
- National Institute for Health Care Management (NIHCM). 2022. “Climate Change Is Affecting Our Mental Health” *Behavioral Health / Environmental Health*. Retrieved March 17, 2022 (https://nihcm.org/publications/climate-change-is-affecting-our-mental-health?utm_source=NIHCM+Foundation&utm_campaign=9d372be3bc-031722_Climate_and_Mental_Health&utm_medium=email&utm_term=0_6f88de9846-9d372be3bc-167737240).
- Nussbaum, Martha C. 2011. *Creating Capabilities: The Human Development Approach*. Harvard University Press. Cambridge, Massachusetts, and London, England.
- Nussbaum, Martha and Amartya Sen. 1993. “The Quality of Life: Quality of Life Measures in Health Care and Medical Ethics.” DOI:10.1093/0198287976.003.0009.
- Paveglio, Travis, Cassandra Moseley, Matthew Carroll, Daniel Williams, Emily Davis, and Alexandra Fischer. 2015. “Categorizing the Social Context of the Wildland Urban Interface: Adaptive Capacity for Wildfire and Community Archetypes.” *Forest Science*. 61:298-310.
- Paveglio, Travis, Catrin Edgeley, Matthew Carroll, Mark Billings, and Amanda Stasiewicz. 2019. “Exploring the Influence of Local Social Context on Strategies for Achieving Fire Adapted Communities.” *Fire*. 2(26): 2-33.

- Public Broadcasting Service (PBS). 2005. “Deinstitutionalization: A Psychiatric ‘Titanic’.” Retrieved October 15, 2020 (<https://www.pbs.org/wgbh/pages/frontline/shows/asylums/special/excerpt.html>)
- Public Broadcasting Service(PBS). 2018. “Fire in Paradise.” October 29, 2019. PBS website: Frontline. Retrieved November 8, 2020 (<https://www.pbs.org/wgbh/frontline/film/fire-in-paradise/>)
- Sauerborn, R., & Ebi, K. 2012. “Climate change and natural disasters: integrating science and practice to protect health.” *Global health action* 5, 1–7.
- Thomas Fire. September 5, 2020. Wikipedia (https://en.wikipedia.org/wiki/Thomas_Fire).
- United States Census Bureau. 2021a. “Quick Facts: Santa Barbara County, California.” Retrieved January 18, 2022 (<https://www.census.gov/quickfacts/fact/table/santabarbaracountycalifornia/INC110219>).
- United States Census Bureau. 2021b. “Quick Facts: Ventura County, California.” Retrieved January 18, 2022 (<https://www.census.gov/quickfacts/fact/table/venturacountycalifornia/DIS010220#DIS010220>).
- U.S. Congress. 2006. *S.3721-Post-Katrina Emergency Management Reform Act of 2006*. 109th Congress, 2005-2006. Retrieved October, 5, 2021 (<https://www.congress.gov/bill/109th-congress/senate-bill/3721>).
- U.S. Government Accountability Office. 2019. *Disaster Assistance: FEMA Action Needed to Better Support Individuals Who Are Older or Have Disabilities*. Reports and Testimonies. Retrieved October 5, 2021 (<https://www.gao.gov/products/gao-19-318>).

Weibgen, Adrien A. 2015. "The Right To Be Rescued: Disability Justice in an Age of Disaster." *The Yale Law Journal* 124(7):2406-469.

Wolfensberger, Wolf P., Bengt Nirje, Simon Olshansky, Robert Perske, and Philip Roos. 1972. "The Principle of Normalization In Human Services." Books: Wolfensberger Collection.
1. Retrieved January 19, 2021 (https://digitalcommons.unmc.edu/wolf_books/1).

Woolsey Fire. September 5, 2020. Wikipedia (https://en.wikipedia.org/wiki/Woolsey_Fire).

APPENDIX A: Survey

Cover Letter:

Welcome to the University of Montana Study on the Environmental Impacts of Wildfires on Individuals with Disabilities

We are interested in understanding your experience with wildfires in recent years (2017-2018). For this study, you will be asked to answer some questions about your experience with the California wildfires. Your responses will be kept completely confidential. Thank you for taking the time to read and answer the following questions.

Instructions:

1. You must be an adult (18 years or older) to participate in this survey.
2. Completion of this task takes approximately 10-20 minutes.
3. This survey will ask questions about a life event that may be difficult for you to answer, if you don't feel comfortable answering you may skip the question, or stop taking the survey at any time.
4. Your participation in this study is voluntary.
5. You may request a copy of the final results and analysis after completing the study questions.
6. Your privacy and confidentiality are important to us. Your name and any personal information will never be attached to your answers here per the ethical standards of the American Sociological Association and the University of Montana. This project has been approved by UM's Institutional Review Board.
7. Please do not put your name or any identifying information in any of the answers except for the last question about results.

Thank you in advance for your participation in this important study.

Madison McKenzie
 Project Director
 Graduate Student
 Department of Sociology
 University of Montana

Have you read the instructions (or had someone read them to you) and do you agree with the terms of participation?

- Yes
- No

Variable and Hypothesis	Author	Question	Selections
		Did you live in one of the following Counties in California between 2017 and 2018?	Ventura County Santa Barbara County No

H1		To what degree, if at all, was your life impacted by the recent California wildfires such as the Thomas and/or Woolsey fires in 2017 and/or 2018?	Very impacted Somewhat impacted Slightly Impacted Not impacted at all
H1, H2, H3, H4		Were you evacuated due to the following fires?	Thomas Fire (December 2017) Woolsey Fire (November 2018) Both the Thomas and Woolsey Fires Other (Please Specify Below) Neither
H1		How long were you evacuated from your home due to the fire(s)?	1-6 Days 1-3 Weeks 1 Month or more Lost home Not Sure
H1		During the fire(s) did you miss out on any of the following activities? (Select all that apply)	School Work Day Program Other (Please Specify Below) None of the above
H1		During the fire(s) was your income impacted in any of the following ways? (Select all that apply)	Missed work Lost Job Lost/damaged home or property Increased medical expenses Increased travel Other (Please specify below) No, my income was not impacted

H1		Before the fire(s) did you struggle with anxiety or depression?	Yes No Don't know
H1		After the fire(s), did you experience an increase in any of the following symptoms as a result of the fire(s)? (Select all that apply)	Panic Attacks Worrying/ Anxiety Depression Social Isolation Stress Nightmares Aggression Other (Please Specify Below)
H1		After the fire(s), did you feel like you needed to seek counseling or other social resources to cope with the aftermath?	Definitely yes Probably yes Might or might not Probably not Definitely not
H1, H4		Did you seek counseling or other social resources to cope with the aftermath of the fire(s)? (select all that apply)	Yes, I sought counseling resources Yes, I sought social resources No, I did not seek any resources No, I was not aware of any resources No, I did not have access to any resources
H1, H4		How satisfied were you with the resources available to you?	Extremely satisfied Somewhat satisfied Neither satisfied nor dissatisfied Somewhat dissatisfied Extremely dissatisfied

H4		Q13 Before the wildfire, were you aware of any of the following wildfire resources to stay informed and get help if needed? (Select all that apply)	Ready Ventura County (VC Alert) Ready Santa Barbara County American Red Cross FEMA SAMHSA Disaster Distress Line Smart 911 None of the above
H4		From which of these sources did you first hear about the fire(s)?	Radio Television Internet Newspaper Another Person Visually Saw the Fire Other (Please Specify Below)
H4		During the fire(s), were you impacted by a loss of any of the following? (Select all that apply)	Power Clean Air Clean Water Food Other (Please Specify Below) No, I was not impacted in this way
H4		How long did your home experience a loss of power?	Less than 1 Hour 1 - 5 Hours 6 - 12 Hours 13 - 24 Hours 24 Hours or More Multiple Days Not Sure

H4		Did you have to relocate due to the loss of power?	Yes, I went to a shelter Yes, I stayed with a friend or family member No, I did not have a place to relocate Other (Please Specify Below) No, I did not need to relocate
H3, H4, H5	Grootaert et al.(2014)	Generally speaking, would you say that most people can be trusted or that you can't be too careful dealing with people?	People can be trusted You can't be too careful
H3,H4, H5	Grootaert et al.(2014)	How much do you trust local government officials?	A great deal A lot A moderate amount A little Not at all
H3, H4, H5	Grootaert et al.(2014)	In general, do you agree or disagree with the following statement? Most people in my neighborhood are willing to help if I need it	Strongly agree Somewhat agree Neither agree nor disagree Somewhat disagree Strongly disagree
H3, H4, H5	Grootaert et al.(2014)	In general, do you agree or disagree with the following statement? In my neighborhood, one has to be alert, or someone is likely to take advantage of you	Strongly agree Somewhat agree Neither agree nor disagree Somewhat disagree Strongly disagree

H3, H4, H5	Grootaert et al.(2014)	If a community project does not directly benefit you but has benefits for many others in the neighborhood, would you contribute time or money to the project?	Will not contribute time Will contribute time Will not contribute money Will contribute money
		Which term do you use to describe your gender identity?	Male Female Transgender Female/Transgender Woman Transgender Male/Transgender Man Genderqueer/Gender-Nonconforming Different Identity (please specify below) Prefer not to say
		Age	Under 18 18 - 24 25 - 34 35 - 44 45 - 54 55 - 64 65 - 74 75 - 84 85 or older
		What is your marital status?	Single (Never Married) Married Widowed Divorced Separated Other (Please Specify)
		Please answer both of the following questions about Hispanic origin and race. Are you of	Yes No

		Hispanic, Latino or Spanish origin?	
		What is your race? Check all that apply	White Black or African American American Indian or Alaska Native Asian Native Hawaiian or Pacific Islander Other
		What is your employment status?	Employed full time Employed part time Unemployed looking for work Unemployed not looking for work Retired Student Social Security (SSI)
H1, H2, H3, H4, H5		Please specify if you are diagnosed with any of the following developmental disabilities?	Autism Spectrum Disorder (ASD) Down Syndrome Attention Deficit Disorder (ADD) Fetal Alcohol Syndrome (FAS) Fragile X Syndrome Intellectual Disability (ID) Cerebral Palsy Other (Please Specify Below) Prefer not to answer
H1, H2, H3, H4, H5		Is there anything you would like us to know about your overall experience with the wildfire(s)?	Yes No

APPENDIX B: Spanish Version of Survey

Q1 Bienvenido al estudio de la Universidad de Montana sobre los impactos ambientales de los incendios forestales en personas con discapacidades del desarrollo

Estamos interesados en conocer su experiencia con los incendios forestales en los últimos años (2017-2018). Para este estudio, se le pedirá que responda algunas preguntas sobre su experiencia con los incendios forestales de California. Sus respuestas se mantendrán completamente confidenciales. Gracias por tomarse el tiempo de leer y responder las siguientes preguntas.

Instrucciones:

1. De ser un adulto (mayor de 18 años) para participar en esta encuesta.
2. Completar esta tarea lleva aproximadamente de 10 a 20 minutos.
3. Esta encuesta le hará preguntas sobre un acontecimiento de su vida que puede resultarle difícil de responder. Si no se siente cómodo respondiendo, puede omitir la pregunta o dejar de responder la encuesta en cualquier momento.
4. Su participación en este estudio es voluntaria.
5. Puede solicitar una copia de los resultados y análisis finales después de completar las preguntas del estudio.
6. Su privacidad y confidencialidad son importantes para nosotros. Su nombre y cualquier información personal nunca se adjuntará a sus respuestas aquí según los estándares éticos de la Asociación Estadounidense de Sociología y la Universidad de Montana. Este proyecto ha sido aprobado por la Junta de Revisión Institucional de la Universidad de Montana.
7. Por favor, no ponga su nombre ni ninguna información de identificación en ninguna de las respuestas, excepto en la última pregunta sobre los resultados.

Gracias de antemano por su participación en este importante estudio.

Madison McKenzie

Directora del Proyecto

Estudiante Graduada Departamento de Sociología

Universidad de Montana

¿Ha leído las instrucciones (o alguien se las ha leído) y está de acuerdo con los términos de participación?

Sí

No

Q2 ¿Vivió en uno de los siguientes condados de California entre 2017 y 2018?

Condado de Ventura

Condado de Santa Bárbara

No

Q3 ¿Hasta qué medida, si es que sucedió, su vida se vio afectada por los recientes incendios forestales de California, como los incendios de Thomas y/o Woolsey en 2017 y/o 2018?

Muy impactado

Algo impactado

Ligeramente impactado

No afectado en absoluto

Q4 ¿Fue evacuado debido a los siguientes incendios?

Thomas Fire (diciembre de 2017)

Woolsey Fire (noviembre de 2018)

Tanto los incendios de Thomas como de Woolsey

Otro (especifique a continuación);

Ninguno de los dos

Q5 ¿Cuánto tiempo estuvo evacuado de su casa debido al/los incendio(s)?

1-6 Días

1-3 semanas

1 mes o más

Perdi mi hogar;

No estoy seguro

Q6 Durante el/los incendio(s), ¿se perdió alguna de las siguientes actividades? (Seleccione todas las que apliquen)

Escuela

Trabajo

Programa del día

Otro (especifique a continuación)

Ninguna de las anteriores

Q7 Durante el incendio/los incendios ¿su situación financiera se vio afectada de alguna de las siguientes maneras?(Seleccione todas las que correspondan)

Falte al trabajo

Perdí el trabajo

Casa o propiedad perdida/dañada

Aumento en los gastos medicos

Aumento en viajes; Otro (especifique a continuación)

No, mis ingresos no se vieron afectados

Q8 Antes del incendio/los incendios, ¿tenía problemas de ansiedad o depresión?

Sí

No

No lo se

Q9 Después del incendio/los incendios, ¿experimentó un aumento en alguno de los siguientes síntomas como resultado del incendio/los incendios? (Seleccione todas las que correspondan)

- Ataques de pánico
- Preocupación/ansiedad
- Depresión
- Aislamiento social
- Estrés
- Insomnio
- Pesadillas
- Agresión
- Otro (especifique a continuación)
- No, no experimenté un aumento

Q10 Debido a su experiencia con el incendio/los incendios, ¿sintió que necesitaba recursos de asesoramiento/ terapia para afrontar a las secuelas?

- Definitivamente sí
- Probablemente sí
- Podría o no
- Probablemente no
- Definitivamente no

Q11 ¿Buscó recursos de asesoramiento / terapia para afrontar a las secuelas de los incendios? (seleccione todas las que correspondan)

- Sí, busqué consejería / terapia
- No, no busqué consejería / terapia
- No, no conocía ningún recurso de asesoramiento / terapia
- No, no tuve acceso a consejería / terapia

Q12 ¿Qué tan satisfecho estuvo con el asesoramiento / terapia disponible para usted?

- Extremadamente satisfecho
- Algo satisfecho
- Ni satisfecho ni insatisfecho
- Algo insatisfecho
- Extremadamente insatisfecho

Q13 Antes del incendio forestal, ¿conocía alguno de los siguientes recursos de incendios forestales para mantenerse informado y obtener ayuda si la necesita? (Seleccione todas las que correspondan)

- Preparado para el condado de Ventura (alerta VC)
- Listo condado de Santa Bárbara
- Cruz Roja Americana
- FEMA
- Línea de socorro en casos de desastre de SAMHSA
- 911 inteligente
- Ninguno de los anteriores

Q14 ¿De cuál de estas fuentes se enteró por primera vez del/los incendio(s)?

- Radio
- Televisión
- Internet
- Periódico
- Otra persona
- Vio visualmente el fuego
- Otro (especifique a continuación)

Q15 Durante el incendio/los incendios, ¿se vio afectado por la pérdida de alguno de los siguientes? (Seleccione todas las que correspondan)

- Electricidad
- Aire limpio
- Agua limpia
- Comida
- Otro (especifique a continuación)
- No, no me impactaron de esta manera

Q16 ¿Cuánto tiempo estuvo su casa sin energía?

- Menos de 1 hora
- 1 - 5 horas
- 6 - 12 horas
- 13-23 horas
- 24 horas o más
- No estoy seguro

Q17 ¿Tuvo que mudarse debido a la pérdida de energía?

- Sí, fui a un refugio
- Sí, me quedé con un amigo o familiar
- No, no tenía un lugar donde reubicarme
- Otro (especifique a continuación)
- No, no necesitaba mudarme

Q18 En términos generales, ¿diría que se puede confiar en la mayoría de las personas o que no se puede ser demasiado cuidadoso al tratar con las personas?

- Se puede confiar en las personas
- No puedes tener demasiado cuidado

Q19 ¿Cuánto confía en los funcionarios del gobierno local?

- Bastante
- Mucho
- Una cantidad moderada
- Un poco
- Para nada

Q20 En general, ¿está de acuerdo o en desacuerdo con la siguiente afirmación? La mayoría de las personas en mi vecindario están dispuestas a ayudar si lo necesito.

- Totalmente de acuerdo
- Algo de acuerdo
- Ni de acuerdo ni en desacuerdo
- Algo en desacuerdo
- Totalmente en desacuerdo

Q21 En general, ¿está de acuerdo o en desacuerdo con la siguiente afirmación? En mi vecindad hay que estar alerta o es probable que alguien se aproveche de ti

- Totalmente de acuerdo
- Algo de acuerdo
- Ni de acuerdo ni en desacuerdo
- Algo en desacuerdo
- Totalmente en desacuerdo

Q22 Si un proyecto comunitario no lo beneficia directamente pero tiene beneficios para muchos otros en el vecindario, ¿contribuiría con tiempo o dinero al proyecto?

- No aportare tiempo
- Contribuire tiempo
- No aportare dinero
- Contribuire dinero

Q23 ¿Qué término utiliza para describir su identidad de género?

- Hombre
- Mujer
- Mujer transgénero / Mujer transgénero
- Hombre transgénero / Hombre transgénero
- Genderqueer / No conforme con el género
- Identidad diferente (especifique a continuación)
- Prefiero no decir

Q24 Edad

Menores de 18

18-24

25-34

35-44

45-54

55-64

65-74

75-84

85 años o más

Q25 ¿Cuál es su estado civil?

Soltero (nunca casado)

Casado

Viudo

Divorciado

Separado

Otro (especifique a continuación)

Q26 Responda las dos preguntas siguientes sobre el origen hispano y la raza. ¿Eres de origen hispano, latino o español?

Sí

No

Q27 ¿Cuál es su raza? Marque todo lo que corresponda

Blanco

Negro o afroamericano

Indio americano o Nativo de Alaska

Asiático

Nativo de Hawái o de las islas del Pacífico

Otro

Q28 ¿Cuál es su situación laboral?

Empleado a tiempo completo

Empleado a tiempo parcial

Desempleado buscando trabajo

Desempleado que no busca trabajo

Jubilado

Estudiante

Seguro Social (SSI)

Q29 Por favor, especifique si le han diagnosticado alguna de las siguientes discapacidades del desarrollo.

- Trastorno del espectro autista (TEA)
- Síndrome de Down
- Trastorno por déficit de atención (ADD)
- Síndrome de alcoholismo fetal (SAF)
- Síndrome X frágil
- Discapacidad intelectual (ID)
- Parálisis cerebral
- Otro (especifique a continuación)
- Prefiero no contestar

Q30 ¿Hay algo que le gustaría que supiéramos sobre su experiencia en general con los incendios forestales?

Sí (especifique a continuación) _____.

No

APPENDIX C: Recruitment Invitation Letter



Department of Sociology
The University of Montana
Missoula, MT 59812-1047
(406)243-4381

June 1, 2021

To Whom It May Concern:

My name is Madison McKenzie, and I am a University of Montana Sociology graduate student inviting _____ to take part in a graduate level research project. As a CSUCI alumni, former Respite Caregiver, and Behavior Interventionist in Ventura County, I was granted the opportunity work with individuals with developmental disabilities for several years. This experience, as well as my own experience with the 2017 Thomas fire, has left a lasting impact on my life and motivated me to further my education in Sociology. My thesis project scope is to conduct a quantitative survey aimed at asking the question: what are the environmental impacts of climate driven catastrophes (specifically wildfires) on individuals with developmental disabilities.

More specifically, I am interested in analyzing how the recent 2017/2018 wildfires (Thomas/Woolsey fires) have impacted Ventura and Santa Barbara County residents who are diagnosed with a developmental disability. With that, I am inviting you to take part in this research by taking on a role to assist me with recruitment for a survey. For instance, sending the survey out via your social media, online platforms, radio, and/or email and mail communication (flyers) to your _____ members and listeners throughout the region. The target population, as stated, includes individuals with developmental disabilities living in Ventura or Santa Barbara Counties during one or both of the 2017/2018 wildfires (no exclusions on age, race, or gender identity). In addition to the role you are being invited to take part in, I have also invited several social service agencies located in the Ventura/Santa Barbara County areas which will help to expand the level of participation and informed nature of this project.

My goal with this research is to send out a user-friendly (accessible/inclusive) survey that will encourage responses from the individuals themselves, as I believe it is important to include their perspective when it comes to this subject. This means, when possible, and with the user-friendly capability of the survey, the individual would be able take it on their own or with the help of a parent/guardian. The respondent's identity will be kept anonymous (we will not ask for identifying information on the survey).

Your help in this study will aide in the understanding of the environmental impacts on individuals with developmental disabilities and how we can use the information to determine what can be done to further expand in having a more inclusive plan and response during times of disaster for this particular population. It also may inform the population of the resources already available to the respondents in an effort to provide support in difficult times. Depending on the analysis of the survey, the impact of this study may also be used to inform policy changes and implementation on inclusive disaster preparedness at the local, state, and national levels. The findings will be shared with the sociological research community at the University of Montana through my thesis defense presentation, graduate level conferences (like PSA, Grad CON, etc.), and may be published in a sociological peer reviewed journal. In the sharing of these findings, _____ has the option of keeping the identity of the organization confidential, if you choose.

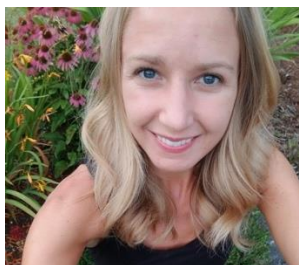
I, as well as my thesis committee and University IRB has taken the necessary care to ensure that the survey and project is inclusive, accessible, and demonstrates the ethical standards when it comes to the vulnerability of the population being surveyed. With that, it is necessary for the IRB to see that, if _____ is interested, I have a written letter of approval from you stating that you approve to take part in the recruitment for this survey.

Please let me know if you are interested in assisting me with this project. Thank you for taking the time to read this letter.

Sincerely,
Madison McKenzie, B.A.
Graduate Student
Mary.mckenzie@umconnect.umt.edu
(406)580-1037

Mark Heirigs, PhD
Assistant Professor – Graduate Committee Chair
mark.heirigs@mso.umt.edu

APPENDIX D: Survey Invitation Flyer (social media, email, newsletters)



Local CSUCI Alumni and former Behavior Interventionist/ Respite Caregiver Madison McKenzie is working on her master's thesis in Sociology at the University of Montana, working on a project titled "Voices of the Often Unheard." Her thesis asks the question: what are the environmental impacts of climate driven catastrophes (like wildfires) on individuals with developmental disabilities? She has created a user-friendly survey with the goal to include the perspective of the individuals themselves.

Are you or someone you know an adult (18 years or older) diagnosed with a developmental disability (Autism, IDD, Down Syndrome, etc.)? Did you/ they live in Ventura or Santa Barbara County during the 2017/2018 Thomas/Woolsey fires? Let us know what your experience was like by taking this anonymous survey. This survey is free and will not ask for your name or any sort of identifying information.
Online survey Link (English/Spanish version):

https://umt.co1.qualtrics.com/jfe/form/SV_6h4Kbq4KBzEgA2q

Request a paper mail-in version (we will keep your mailing address confidential):
mary.mckenzie@umconnect.umt.edu

QR code to scan:

Thank you for your time and participation in this important study!



Madison McKenzie
Project Director
Graduate Student
Department of Sociology
University of Montana
mary.mckenzie@umconnect.umt.edu

Mark Heirigs Ph.D.
Facility Supervisor
Graduate Chair Department of Sociology
University of Montana
mark.heirigs@mso.umt.edu

APPENDIX E: Zoom Script

(*Note: some language used here changed from “individuals with developmental disabilities” to “you” specific language because in some cases I was speaking directly to possible survey participants.)

My name is Madison McKenzie, and I am currently a Sociology Graduate student at the University of Montana. I have a survey for my thesis research that I would like to invite you to participate in that will take about 10 to 20 minutes of your time. For this research, I am interested in understanding your experience with wildfires in recent years (2017-2018). The title of this research project is called “Voices of the Often Unheard” because it gives adult (18 years or older) individuals with developmental disabilities an opportunity to let us know about their experiences with the recent wildfires. Your participation in this research is voluntary. In the survey, you will be asked to answer some questions about your experience with the California wildfires which may be difficult for you to answer, if you feel uncomfortable answering any questions you may skip them, and you may stop the survey at any time. Your survey responses will be kept confidential, and the survey will not ask you for your name or any identifying information. This survey will not impact your relationship with _____ or the University of Montana. If you have any questions, please do not hesitate to let me know. Your participation and time is greatly appreciated.

APPENDIX F: Recruitment Approval Letter

May 20, 2021

Dear University of Montana IRB Committee:

I am writing this letter to communicate the _____ support of Madison McKenzie's research proposal to conduct quantitative research on the environmental impacts of climate driven catastrophes (wildfires) on individuals with developmental disabilities. I authorize Madison McKenzie to have recruitment support from the _____ to send out the survey via our social media, online platforms, and/or email and mail communication (flyers) to the families and individuals served.

Please feel free to contact me should you have any questions about our support of this research.

Sincerely,

APPENDIX G: English End of Survey Resources:

We thank you for your time spent taking this survey.

Your response has been recorded.

If you are continuing to experience distress due to your experience with the wildfires, please visit the following:

SAMHSA - Disaster Distress Line: <https://www.samhsa.gov/find-help/disaster-distress-helpline>

Please see the links below for further disaster preparedness and recovery resources:

Ready Santa Barbara County: <https://readysbc.org>

Ready Ventura County: <https://www.readyventuracounty.org/vc-alert/>

FEMA - California: <https://www.fema.gov/locations/california#block-views-block-related-links-block-1>

Smart 911: <https://www.smart911.com>

APPENDIX H: Spanish End of Survey Resources:

Le agradecemos por el tiempo dedicado a responder esta encuesta.
Sus respuestas han sido registradas.

Si continúa experimentando angustia debido a su experiencia con los incendios forestales, visite lo siguiente:

SAMHSA - Línea de socorro por desastres: <https://www.samhsa.gov/find-help/disaster-distress-helpline>

Consulte los enlaces a continuación para obtener más recursos de preparación y recuperación ante desastres:

Ready Condado de Santa Bárbara: <https://readysbc.org>

Ready Ventura County: <https://www.readyventuracounty.org/vc-alert/>

FEMA California: www.fema.gov/locations/california#block-views-block-related-links-block-1Smart

Smart 911: <https://www.smart911.com>

APPENDIX I: Thomas Fire (2017) and Woolsey Fire (2018) County Map Comparison

