Needs and Experiences of Latinx Migrant and Seasonal Farmworkers
Before, During, and After Natural Disasters in Rural North Carolina

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Executive Summary

Due to structural factors, migrant and seasonal farmworkers (MSFWs) in the United States experience heightened challenges surviving and recovering from natural disasters, which negatively impact public health. Climate change models predict North Carolina (NC) will face an increased frequency and intensity of natural disasters in the near future, making disaster preparedness for MSFWs an urgent issue. This study sought to answer: how do Latinx MSFWs in rural NC experience natural disasters and how can policies and programs better serve the unique needs of this population in emergency situations?

This study used qualitative descriptive methods and key informant interviews with service providers and Latinx MSFWs. It used emergent theme analysis (coding with NVivo). Key informants reported that MSFWs are economically important to their communities, though also very marginalized. They face various barriers to preparing for natural disasters: economic constraints, low English proficiency, potential distrust of government institutions or fear of law enforcement, and geographic isolation. After Hurricane Matthew, which caused severe damages to NC’s rural counties in 2016, many MSFWs were left stranded in flooded trailers, exposing them to lasting mental and physical health risks. Flooding prevented most MSFWs from working for up to several weeks, which impacted their families financially.

This study contributed to the literature by including both MSFW and service provider perspectives. Future studies should examine ways to (a) improve MSFWs’ access to preparedness information and emergency alerts, (b) help emergency services departments provide resources to MSFWs, and (c) better understand the impacts of natural disasters on MSFWs’ physical and mental health. Though local governments in rural NC are aware of their
shortcomings in working with diverse communities, they will need further resources to improve their relationships with Latinx MSFW communities.

Introduction

Researchers have documented that access to economic resources and social capital impact survival and recovery from natural disasters.\(^1\) Many immigrant populations in the United States (US) have limited access to these resources and have thus struggled to survive and recover during hurricanes, floods, wildfires, earthquakes and other natural disasters. Immigrants with a low English proficiency (LEP) have difficulty understanding English evacuation warnings.\(^1\) Immigrants who are migrant and seasonal farmworkers (MSFWs) often lack transportation, which makes evacuation challenging. Many immigrants who fear deportation and are unaware of their rights avoid seeking government assistance.\(^2\) Many MSFWs are also economically disempowered, an obvious barrier to recovering from financial shocks.\(^3\)

In 2012, the National Center for Farmworker Health estimated that between three and twelve million MSFWs currently live in the US, most of whom are Latinx.\(^4\) MSFWs live in employer-provided housing and move seasonally with their work. They face specific vulnerabilities during natural disasters. Due to climate change, scientists predict that natural disasters will grow in intensity and increase in frequency in the near future, strongly affecting the predominantly rural eastern part of North Carolina (NC).\(^5\) About 100,000 to 200,000 MSFWs live in NC—the sixth-highest number for any state in the US.\(^3\)

In the US, immigrant, Latinx, and MSFW communities are particularly vulnerable in emergency situations.\(^3,6-8\) These vulnerabilities contribute to differentially poor mental and physical health outcomes for Latinx immigrants after natural disasters, such as hunger, sleep
disturbances, lack of healthcare access, emotional stress, and exacerbated chronic health conditions.¹ To the best of my knowledge, no studies have looked specifically at the impacts and experiences of recent natural disasters on Latinx MSFWs in rural areas of NC, nor has anyone outlined the resources available to Latinx MSFWs, perspectives of service providers on this topic, or the barriers that prevent universal access to these resources for MSFWs.

Research question

This paper addressed the central question: how do Latinx MSFWs in rural NC experience natural disasters and how can policies and local programs better serve the unique needs of this population in emergency situations?

Definitions and justification of terms

The term “Latino” was used in referenced studies to indicate people in the US of Latin American origin. “Hispanic” was used as a more general term to encompass Spanish speakers. Unless directly referring to a study’s semantics, I used the term Latinx as a gender-inclusive way to represent the community of people of Latin American (Mexican, Puerto Rican, Dominican, Cuban, Central and South American) origin and/or descent in NC. Latinx people may be of any race. Latinx has been championed as a term that is adaptable to “those Latino/as who have been consigned repeatedly to the margins by dominant US culture [and] the State” and actively includes “the refugee, the migrant, the undocumented, the incarcerated, the stateless, and so on.”⁹ Given NC’s recent history of discrimination against transgender people through the passage of “House Bill 2: The Public Facilities Privacy and Security Act,” which requires transgender
people to use public restrooms based on their biological sex assigned at birth, it is especially appropriate that the terms used to describe NC’s residents are as gender-inclusive as possible.\textsuperscript{10}

In my study, “natural disasters” and “emergency situations” or “emergency contexts” referred to extreme weather events (such as hurricanes, floods, wildfires, heat waves and earthquakes) that lead to significant damage and/or loss of life. I used these terms interchangeably. The weather events themselves, defined as hazards, turn into natural disasters when they affect vulnerable people.\textsuperscript{11}

\textit{Vulnerability} to a natural disaster is a combination of probability of hazard occurrence and potential for loss, which is created through social inequality.\textsuperscript{11} I did not use a rigid definition of “preparedness,” to avoid biasing the reader toward findings on varied perceptions of preparedness among the MSFW and service provider participants.

\textit{MSFWs} referred to “people who are employed more than 50 percent of the time in agriculture on a seasonal basis over a 24-month period.”\textsuperscript{7} Their work ranges from handpicking fruits and vegetables to working in packing plants.\textsuperscript{7} Many migrant farmworkers travel to the US on federal H-2A “guest worker” visas (the Temporary Agricultural Worker program), which allow them to work in agriculture for about half of the year as non-immigrant foreign nationals.\textsuperscript{12} NC imports 14,000-17,000 H-2A workers annually, as one of the largest users of this program. Migrant workers are different from seasonal workers, the latter who “are employed in agricultural work but do not move from their permanent residence to seek agricultural work.”\textsuperscript{4} Since H-2A workers are both migrant and seasonal, current literature describes them under the combined MSFW category.

As estimated by the American Immigration Council in 2017, 350,000 immigrants in NC lack legal permanent residency, thus forcing them into the category of “undocumented.”\textsuperscript{13} Given
their precarious status as residents, it is challenging to accurately quantify this number. Nonetheless, legal status was not central to this study, nor did it serve as exclusion criteria. Several referenced studies used the terms “immigrant” and “undocumented” immigrant; my research was concerned specifically with Latinx MFSWs.

_Social capital_ was defined as “productive social resources that help actors to achieve certain ends.”\(^{11}\) Such capital includes systems of trust, reciprocity, obligation and norms. _Social networks_ were defined as sets of individuals connected by various types of relationships (kinship, friendship, national origin) or interactions (informational, monetary, sharing of resources).\(^{11}\)

### Theoretical Framework

Natural disasters and immigrants in the US

Research has shown that immigrant communities experience heightened risks during natural disasters.\(^{3,7,8,11}\) They often struggle to evacuate, either from not receiving or understanding evacuation mandates or from a lack of personal transportation. After natural disasters, they often experience worse outcomes—such as lack of access to shelters and financial recovery assistance—than native-born community members.\(^{3,7,8,11}\) After the attacks of September 11, 2001 (a man-made disaster that led to immediate shutdown of city infrastructure and health consequences for the diverse residents of a large city) and Hurricane Katrina in 2005 (a natural disaster that also impacted a large city with many immigrant residents), researchers became more interested in the differential risks and consequences to immigrants of natural and man-made disasters throughout the US.\(^{14}\)

One such researcher, Brenda Muñiz, documented how immigrants of various origins—including Central and South American—were neglected by government response workers,
denied financial aid for which they were eligible, and sometimes placed into deportation proceedings after seeking basic assistance post-Hurricane-Katrina. Other studies identified lack of transportation as a major barrier to disaster survival for immigrants in New Orleans, NC and Texas.

Researchers have documented the challenges that face Latinx MSFWs, more specifically, in the wake of various natural disasters throughout the US. Before disasters strike, MSFWs often live in vulnerable housing and economic situations, which reduce their likelihood of surviving and prospering post-disaster. Most MSFWs live below the poverty level, with half earning less than $7,500 annually. According to the Federal Emergency Management Agency (FEMA), undocumented immigrants are only eligible for temporary post-disaster assistance (such as staying in emergency shelters), but not financial or housing aid after natural disasters. US citizens, non-citizen nationals, and “qualified aliens” can apply for the Individuals and Households Program for Housing Assistance, for uses such as reimbursement for short-term lodging, rental assistance for temporary housing, permanent housing construction, and other disaster assistance options. This FEMA policy affects the portion of Latinx MSFWs who are undocumented; they are ineligible for most post-disaster housing and financial assistance provided by the federal government.

Language is another key barrier for immigrants facing natural disasters in the US. Many emergency notification systems only provide English language emergency alerts and evacuation warnings and mandates, endangering and disempowering LEP residents. The negative impacts of subpar emergency notification are compounded by restricted access to transportation, limited housing assistance and inadequate funds for unanticipated expenditures for MSFWs.
Natural disasters and Latinx populations in the US

Focus groups with Latinxs in various parts of the US have corroborated the above findings.3,18,19 For instance, research by Carter-Pokras et al with Latinx focus groups found that many Latinxs in the US have different perceptions of “emergencies” than non-Hispanic whites. Rather than citing natural disasters, participants in Carter-Pokras et al’s study—immigrants from 13 Latin American countries residing in a suburban county of Washington, D.C.—reported a range of “perceived personal emergency risks,” such as immigration problems, crime, personal insecurity, gangs, home/traffic accidents, home fires, environmental problems, and snipers.18 These participants, as well as the MSFWs in Burke et al’s study, were insufficiently prepared for disasters: few had received information on emergency preparedness and most did not have an emergency plan. They reported a strong desire for their communities to become more aware of and better prepared for natural disaster threats.3,18

In various studies, Latinx immigrants reported a distrust of the US government or belief that the government does not want to help them in emergency rescue and recovery efforts.3,7,16,18 There is a growing body of literature showing that being undocumented in the US causes people to live with “intense fear of deportation and a life of permanent anxiety,” without access to legal resources.20 Since Immigration and Customs Enforcement (ICE) has been gaining increased media attention in recent years for leading “raids” that result in detention and deportation of Latinx immigrants, and because local police departments collaborate with ICE, many law-abiding immigrants have felt an increasing pressure to avoid interactions with their local police.20

Hacker et al, using focus groups of immigrants from five different language groups in a Massachusetts community, observed themes of fear of deportation, fear of collaboration between
local law enforcement and ICE (and a perception of arbitrariness on the part of the former), and concerns about not being able to furnish documentation required to apply for insurance and healthcare. In this study, both documented and undocumented immigrants reported high levels of stress due to fear of deportation, which affected their emotional well-being and their access to health services. These fears may also contribute to an underuse of available survival and recovery resources among Latinx immigrant communities post-natural disaster, though no studies have looked at this connection.

Messias et al’s in-depth research of Latinx social networks in the aftermath of Hurricane Katrina showed that social networks provided some clear benefits to these communities during and after the disaster. However, “Latino social networks”—defined as “sets of individuals connected by various types of relationships (kinship, friendship, national origin) or interactions (informational, monetary, sharing of resources)”—did not improve access to government-provided aid. The social networks of Latinx permanent residents likely differ from those of migrant farmworkers. Overall, Latinx MSFW communities received less government-provided disaster assistance than other demographics, despite a higher need. This lower level of assistance is due to a combination of factors, including a language barrier, lack of knowledge of resource availability, and fear of interactions with the US government.

Natural disasters and health of US immigrants

Researchers have analyzed the disparate impacts of natural disasters on the health of various immigrant communities in the US. An assessment of health among Vietnamese immigrants in New Orleans before and after Hurricane Katrina found significant declines in mental and physical health one year after the storm, though most of these levels returned to
normal after two years. Since the pre-Katrina data was originally gathered before the storm to be used toward a different study, there was no similar dataset for non-Vietnamese residents.\textsuperscript{15}

Natural disasters are proven to cause negative mental health outcomes in survivors, such as anger, depression, generalized distress, and post-traumatic stress disorder (PTSD), though these symptoms often diminish over time.\textsuperscript{21} There is some evidence that these mental health outcomes may be disproportionately worse for Latinx/Latinx immigrant natural disaster survivors, though there is insufficient evidence to determine the role that ethnicity plays in these outcomes.\textsuperscript{21} For instance, Perilla et al found that a “Spanish-preferring Latino” population in southern Florida experienced disproportionately high post-traumatic stress after Hurricane Andrew (in 1992) compared to Caucasians, African Americans, and “English-preferring (more acculturated) Latinos.”\textsuperscript{21} In El Paso, Texas, Hispanic immigrants reported worse mental and physical health after a severe flood incident.\textsuperscript{16} In this sample population, mental and physical health indicators worsened in correlation with event exposure and demographic and socioeconomic characteristics. Low socioeconomic status and older age were strongly associated with negative post-disaster health outcomes. Access to routine medical care was found to be protective against these outcomes, and non-US citizenship and English-speaking proficiency were found to significantly predict health problems.\textsuperscript{16}

These results, as stated by Collins et al, “suggest that certain dimensions of minority and immigrant status are risk factors, while others are protective factors, in the context of disaster in this immigrant gateway community.”\textsuperscript{16} Since El Paso County is predominantly urban, Collins and colleagues’ findings on specific risk factors may not all be applicable to Latinx MSFWs in NC. Collins et al did not specify whether their study’s participants were migrant workers, seasonal workers, and/or farmworkers.
Finally, research by Messias et al studying “Katrina-related health concerns of Latino survivors and evacuees” found that some of the worst health concerns for this post-disaster population were: hunger (lack of food and water), “emotional pain” and stress, “risking personal health and safety in the process of providing mutual assistance,” lack of access to healthcare (low health insurance rates), environmental health risks, “compounded risks of being undocumented and uninsured,” and sleep disturbances.1 Though not generalizable to MSFWs in NC, these health effects provided directional guidance for my research questions.

Natural disasters and Latinx MSFWs in NC

My research built upon that of Burke et al, who assessed awareness, perceived risk, and practices regarding disaster preparedness and response of Latinx MSFWs and their families in Eastern NC in 2012. This mixed-methods study used qualitative focus groups and quantitative survey methodology. They found that MSFWs temporarily residing in NC were concerned about hurricanes, though they lacked proper resources for an emergency (emergency kits in homes, evacuation plans, home internet, knowledge of what to include in an emergency kit, etc.). Transportation and language were barriers to preparedness, though emergency broadcasts and text message alerts in Spanish were found to be useful.3 This research was conducted before Hurricane Matthew, a catastrophic hurricane that struck NC in 2016. It is possible that Latinx MSFWs’ perceptions of interactions with government officials in the US have changed since 2012.
Climate change and natural disasters

Given the relation between natural disasters and climate change, my research is particularly urgent. Billing et al attempted to locate the areas of NC that face the strongest risks of natural disasters, based on predicted trends of climate change, though much of these phenomena remain largely unpredictable. Their findings anticipated “potential increases in intensity and/or frequency of Atlantic hurricanes [that] will have direct, negative impacts on NC’s coastal plain.”\(^5\) Rising temperatures will cause more heat waves during the summer months, which will “have [a] significant impact on agriculture, health and air quality.”\(^5\) These researchers concluded that NC’s communities must adapt to inevitable changes in weather patterns.\(^5\)

My study was an opportunity to consider the integrated relationship between environmental racism and climate change. The term “environmental racism” was coined by Environmental Justice (EJ) Movement activists in the late 1980s and early 1990s, to “describe processes that resulted in minority and low-income communities facing disproportionate environmental harms and limited environmental benefits.”\(^22\) The EJ Movement has grown over the past three decades. It has focused heavily on connections between housing segregation and discrimination with exposure to environmental hazards among low-income and racial minority communities (such as homes built in proximity to waste facilities that can cause asthma or cancer). Climate scientists have been slow to identify the inequitable, racially-disproportionate impacts of climate change. My study aimed to show how environmental threats can be amplified along the lines of ethnicity, English proficiency, legal status, and socioeconomic status.
Background

Immigrants in NC

NC is home to a small but growing population of immigrants. Over 44% of all residents working in farming, fishing, and forestry occupations in the state are immigrants. The top countries of origin for immigrants in NC are Mexico (30.6%), India (7.6%), Honduras (4.6%), El Salvador (3.6%), and Guatemala (3.3%). There is an emergent need to understand the experiences of these large, diverse communities.

Rural Counties in NC

My research focused primarily on Johnston and Sampson counties. These counties are partially economically dependent upon agriculture, are heavily low- and moderate-income (based on the U.S. Department of Housing and Urban Development’s definition), and geographically diffuse. Latinx communities are clustered in certain areas within these counties, often coinciding with the highest rates of poverty. For example, the population of Johnston County is 13.2% Latinx (compared to 9% in the state overall), with some towns up to 46.7% Latinx. The highest rate of poverty, 42.7% of the population, is found in the town with the largest Latinx population. The LEP populations—defined as “populations 18 years or older that speak English less than very well”—primarily speak Spanish.

Sampson County, smaller and more rural than Johnston, is 18% Latinx, with the largest LEP group also primarily speaking Spanish. Ingold, the town with the highest Latinx population (50%), also has the highest poverty rate (86%). The agricultural industry is one of the top four major sectors of employment in this county.
Hurricane Matthew overview

At the initiation of my research, Hurricane Matthew was the most recent major natural disaster to have impacted NC. Hurricane Matthew made landfall as a Category 1 storm in NC in October 2016, bringing unprecedented flooding to the eastern coastal plain and coast. The slow-moving storm dropped up to 18 inches of rainfall over a 36-hour period, causing at least 26 deaths and $4.8 billion in damages to 100,000 homes, businesses and government buildings. At the height of the storm, 3,744 individuals fled to 109 shelters throughout the state; 800,000 households lost power, and 635 roads were closed. All of the counties relevant to my study were among the 48 that FEMA declared major disasters. To this day, the recovery effort is ongoing.

Expectations

Consistent with previous studies, I anticipated finding that Latinx MSFWs devoted limited time to preparing for disasters, despite awareness of risk and concerns for imminent threats. I expected participants’ responses to begin to illuminate Latinx MSFWs’ challenges to disaster preparedness, survival, and recovery, in relation to structural factors (such as their housing and limited financial resources). I expected barriers for Latinx MSFWs to receiving disaster assistance to also include: language access, access to reliable transportation, and distrust of local government due to fears of detention and deportation.

I anticipated finding that natural disasters impacted the short- and long-term mental and physical health of Latinx MSFWs. I suspected that Latinx MSFWs with low incomes had insufficient contingency funds to cover unexpected disaster recovery costs, and that natural disasters that disrupt farming could threaten MSFWs’ jobs and consistent sources of income. In addition to confirming and expanding upon these themes from previous research, I anticipated
capturing valuable firsthand narratives from both service providers and MSFWs about their experiences with natural disasters in NC. I expected the service provider perspectives to add an enriching layer to this body of research.

Methodology

Methods, sampling, and recruitment procedures

This study used qualitative descriptive methods and the key informant technique: interviews with key informants and MSFW participants.25 Key informants are community members who, “as a result of their personal skills, or position within a society, are able to provide more information and a deeper insight into what is going on around them.”26 A method originally used in the field of cultural anthropology for ethnographic research, the key informant technique is now widely used in social and health sciences.26 I used respondent-driven sampling (snowball) referrals as well as convenience sampling to recruit participants. Due to my limited ability to travel to conduct interviews, I restricted interviews to locations that I could feasibly reach. The Duke University Institutional Review Board (IRB) provided ethical approval for this study. Under Duke’s IRB protocol, post-disaster populations are not a protected group.

Recruitment of service provider key informants

Using publicly-available information, I emailed staff at the NC Department of Health and Human Services (DHHS) Office of Rural Health, who referred me to some of the clinics that they fund through the Farmworker Health Program. I also used publicly-available websites to identify potential participants in local and county governments in the same counties as these
clinics, focusing on those that were accessible, and impacted by Hurricane Matthew and/or at risk of future hurricanes.

I contacted each potential participant through email, using a contact script and attaching a flyer with study details. We then arranged phone calls or in-person interviews. When possible, these interviews were in person.

**Recruitment of Latinx MSFWs**

I contacted a local, religious organization in Harnett County that provides basic services (religious services, food and clothing assistance, etc.) to farmworkers. Through the Executive Director of this organization, I tried to establish trust with its clients. I visited this organization twice in-person, distributing flyers advertising my study and potential payment for participants (in Spanish) to community members before a church service. The Executive Director helped advertise the study, hanging a flyer in the building, telling his clients about the study, and making an announcement at the church service, seeking farmworkers who had experienced a natural disaster while living in the US (preferably in NC). After learning about the study in one of these ways, participants approached me either before or after the service. Thus, respondents were self-selecting if they believed they met the study criteria. Some MSFWs encouraged their friends to participate. Due to these recruitment methods, there was a lack of diversity within the farmworker sample, which I discuss in “Contribution to the literature.”

**Interview procedures**

I collected all data through interviews. Participants provided informed oral consent before interviewing began. Service provider key informant interviews lasted from 20 to 45 minutes and
MSFW interviews from 12 to 30 minutes, depending on how much participants chose to share.
In one case, three employees at a farmworker service nonprofit organization chose to participate together as a group. These key informants and all MSFWs chose to interview in Spanish. All other service provider key informants preferred to interview in English and one-on-one. Three service provider interviews were conducted over the phone; the other two were in person. I interviewed all MSFWs one-on-one (in person) at the crowded facility of the organization and provided $10 in cash as compensation. For the other in-person key informant interviews, I traveled to the participants’ workplaces throughout Sampson and Johnston Counties. All service provider key informants were not compensated.

The interviews were semi-structured. I had prepared a basic outline of questions of interest (Appendices 1 and 2), though I allowed the participants to direct the conversation. Each interview varied in how closely it followed the prepared list of questions and potential probes.

Data analysis

I recorded every interview and transcribed the audio. I analyzed all Spanish content using codes in Spanish; I only translated into English the quotations that have been included in this report. I used thematic analysis, coding on NVivo software, to identify common themes throughout these interviews. This emergent theme analysis is similar to a grounded theory approach, though I do not claim to establish new theories, given the small sample size and relative homogeneity of participants.
Results

Description of participants

I interviewed seven service providers and seven Latinx MSFWs. Due to the population that was most accessible, all the MSFW participants were Mexican migrant workers on H-2A visas, who spend half their year working in the US and the other half in Mexico. They work across Johnston, Sampson, Harnett, Wayne, Cumberland, Duplin and neighboring counties, though all were living in Harnett or Johnston County at the time of the interviews. All MSFWs were male-identifying. I refer to them throughout this paper as “MSFW Key Informants” and cite their responses in aggregate for the sake of protecting their privacy.

The service provider key informants were: two employees in the NC DHHS Office of Rural Health, three employees at a farmworker nonprofit organization in Johnston County, one employee at the Sampson County Emergency Services Department and one employee at the Johnston County Department of Emergency Services.

The participants are referred to as:

<table>
<thead>
<tr>
<th>Participant Name</th>
<th>Description of Participant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Key Informant 1</td>
<td>DHHS employee</td>
</tr>
<tr>
<td>Key Informant 2</td>
<td>DHHS employee</td>
</tr>
<tr>
<td>Key Informant 3</td>
<td>Johnston County Department of Emergency Services employee</td>
</tr>
<tr>
<td>Key Informant 4</td>
<td>Sampson County Emergency Services Department employee</td>
</tr>
<tr>
<td>Key Informant 5</td>
<td>Farmworker support nonprofit organization employee</td>
</tr>
<tr>
<td>MSFW Key Informant</td>
<td>Migrant and seasonal farmworker</td>
</tr>
</tbody>
</table>
Local resource assessment

State level

The service providers who served as key informants for this project explained the different emergency preparedness, rescue, and recovery resources that are available to their constituents or clients. The NC DHHS runs an Office of Rural Health, which houses the Farmworker Health Program. This program has existed for 25 years. The Farmworker Health Program receives funding from the federal Health Resources and Services Administration, which it distributes through a competitive grant process to 9-12 clinics throughout the state that provide healthcare services to farmworkers. There are about seven people on staff at this program in Raleigh, and $3.7 million of federal grant funding was made available for this program in 2017.

The program directly funds “enabling services,” including “case management, health education and patient interpretation, as well as medical encounters: primary care, some specialty care, dental care, and behavior healthcare encounters” (Key Informant 1). It also trains and provides funding for outreach staff, who work directly with farmworkers to overcome barriers to health services. Each funded site has at least one outreach worker (there 20 to 30 outreach workers in total). In 2017, the program reached 55 counties throughout NC, 38 of which were primarily rural.

There is currently no one working with the Farmworker Health Program team to disseminate disaster preparedness information directly to farmworkers, though a key informant remembered that a DHHS staff member used to work with the State Emergency Management Division (EMD) some years ago (Key Informant 1). Though the outreach staff “tend to know their local resources” and could likely inform farmworkers of what to do during an emergency,
there is nothing “in place for training outreach staff on emergency preparedness beyond…what might happen if there was an actual emergency” (Key Informant 1).

Although most of Farmworker Health Program staff are bilingual and have voluntarily served as interpreters or translators for the State EMD in Raleigh, they do not have a formal mandate to serve as interpreters. The key informants were unsure how much information they have published in Spanish (Key Informants 1 & 2). The Farmworker Health Program recently hired a new team member to integrate behavioral health services into the primary care clinics they already fund. They are planning to contract bilingual licensed clinical social workers and expand tele-health services to improve access to mental and physical health services for farmworkers living in remote rural areas (Key Informant 2).

County level

According to a key informant, Johnston County is the third-largest geographic county in NC, and has a robust, well-funded Department of Emergency Services. This department is currently focused on improving its reach to Latinx community members, especially MSFWs, including planning to hire its first bilingual team member. Currently, only Johnston County’s Emergency Medical Services and law enforcement have bilingual employees. Emergency Services has previously concentrated on accessing Latinx community members by providing information to children in the school system in the hopes that “…we’ll talk to the kids and they’ll talk to the parents and we’ll figure it all out” (Key Informant 3). The Department of Emergency Services has also conducted outreach at Latinx places of worship. The department relies heavily on social media to disseminate messages to the general population. Residents can sign up for
“JoCo alerts,” through which Emergency Services can “reverse 911” and send mandatory messages (only available in English) to landline phones (Key Informant 3).

The Sampson County Emergency Services Department has taken an extra step and met with different “Latino organizations” in the county (Key Informant 4), translated pamphlets on disaster preparedness into Spanish, and begun disseminating them to the Latinx population. The department collaborates with a farmworker health clinic (funded through the Farmworker Health Program) to spread information. After Hurricane Matthew, the department now feels as if it has a better idea of where the farmworkers are located, and “one of [its] main priorities is working with the Latinos and getting the [preparedness] information out” (Key Informant 4). It has also disseminated information through children in the school system. The Sampson County government strives to always have a Spanish-speaking translator available when the Emergency Operations Center is open. The Emergency Services Department works closely with the Sampson County DHHS, which has more bilingual staff. I did not interview county-level emergency services officials in neighboring counties, so the discussion of these resources only pertains to Johnston and Sampson Counties.

Nonprofit level

Various nonprofit organizations in rural areas of NC advocate for and serve the needs of farmworkers. I spoke with staff at one such program, which receives funding from DHHS’s Farmworker Health Program to run its mobile clinic, in-person night clinic, dental clinic, and health outreach. This weekly night clinic sees around 20 patients per week during its single shift. The organization also trains “promotores de salud,” or health outreach workers. The outreach workers focus exclusively on health topics, such as nutrition, preventive care, and referrals to
clinics. They have been “well-received” by the farmworkers, who pass the information on to those who were not able to interact directly with an outreach worker (Key Informant 5).

The program has expanded since it began two years ago. Outreach workers help transport the farmworkers to clinics and accompany them to their visits, often serving as interpreters. They work primarily in Johnston, Sampson, Harnett, Wake and Duplin counties. Although all county emergency services are available to anyone in need, very few resources in these areas are specifically tailored to Latinx MSFWs. The nonprofit organizations and clinics funded by the Farmworker Health Program, especially their outreach teams, are some of the few resources intentionally directed toward Latinx MSFWs.

Perceptions of Latinx MSFWs in their communities

In every key informant interview, participants mentioned the marginalization of MSFWs in their communities. Key informants all reiterated that MSFWs, and the Latinx community in general, in these rural counties are isolated and disconnected from the non-Latinx community yet make important economic contributions. Key informant 1 provided the following observations:

I think most people don’t realize [MSFWs are] there. Farmworkers are pretty invisible. Because of the work that they do they’re often in remote rural areas where they live and work. Oftentimes they don’t have transportation—their own transportation—so they rely a lot on growers, …so they’re not coming into town as frequently as maybe somebody would. And this is a little bit generalized…[but] in general, I think unless people are educated about farmworkers it’s kind of like they know they’re there, but you don’t really see them unless you’re really going out in the fields. ...Oftentimes they’re in housing that people would think of as abandoned …you wouldn’t even expect people to be living there…. But…in my experience most people do not realize that farmworkers are part of their community and they lump them with other Latinos as well.

Key informant 2 had similar impressions of Latinx farmworkers throughout rural NC:

I think the farmworkers or just the Latino population in general, I think they’re, they contribute a lot to the local economy. Just to give an example, …there’s a small town called Franklin, North Carolina, and Franklin has a grower that has a huge farm…
and each year he contracts workers from Mexico through the H-2A visa program, where he contracts them for whatever amount of time—6, 2, 3 months—and they come over on a visa to work in the fields. So, he hires like 200-300 of them every year, in Franklin, so that influx I think plays a significant role in the economy. Whenever they come, you know, these guys, they consume, they buy, they go to the gasoline station, they go to Walmarts, they go to restaurants, they go to the local Mexican stores. You know they have to buy their groceries and they have to send money back to Mexico, so I think…they play a significant part in the economy. …they contribute to the economy just like anybody else….These farmworkers, they establish roots here, they start making families, their kids go to the local schools, they contribute to the public resources that are out there, they contribute to you know consuming and paying sales tax. So yeah, I think [they] are an important part of these communities.

When reflecting on non-Latinx residents’ perception of the Latinx farmworkers, this informant reiterated MSFWs’ isolation and limited community involvement, adding:

> It’s like, you know that saying out of sight out of mind, the community doesn’t see them and so they don’t mind. …But once they start coming like once they arrive for the season, you know suddenly they’re shopping at Walmart, and you see them at the local gasoline station, …that’s when people are like you know, what are you doing here. That’s when the perceptions change. It changes when they actually see them. They’re actually like, being part of the community and consuming. …I mean I’m sure that the community’s aware that the farmworkers are there, but you know it’s probably like I said, like they don’t see them anyway. …you only see them for part of the season, part of the year. …So, I guess they don’t mind.

Key Informant 3 shared a personal perspective on Latinx community members:

> I think they play a very important role and I think… they like to work and come home and be with their family and just live life. You know, the opportunities for worship, I think, brings them together sometimes. The school system again, kids, you know, they’re here to get an education. It’s, my wife is a principal, been a principal in the school system for a long time. And I’ve always heard her say…your migrant/your Latino kids are much more appreciative of the education, the lunch, the opportunity to be there and learn, and the parents are much more appreciative than what [other] residents are. …Whether they’re just happy to be there or whether they just want to fly under the radar, either way, …I think overall, they’re just much more appreciative of the opportunities they have while they’re over here.

Key Informant 4 acknowledged MSFWs’ contributions as well as their lives on the outskirts of the community, saying:
They have a great big role, I mean… they certainly put back into the economy in Sampson County. They have, it’s a phenomenal role that they play you know. I have no clue how many there’s actually here, but without those folks our economy isn’t what it is.

In sum, key informants’ perceptions of Latinx community members varied by their level of involvement with this community, though all acknowledged several key themes: Latinx community members make significant, valuable economic contributions to their communities, yet are marginalized to the extent that many other residents may not even know they are there. I analyze this material later in this paper (see “Discussion”).

Barriers to accessing resources

Location

The key informants identified various potential barriers that prevent MSFWs from accessing all available services in emergency contexts. MSFWs rely on their bosses for transportation, including for emergency evacuations, unless outreach workers or nonprofit employees help transport them. Many service providers were concerned about the relative isolation of the farmworkers:

…they live out on like these country roads and in these areas where there’s hardly any types of services at all. They live like many miles away from like grocery stores or something, and there’s not community health centers there so they have to travel a fair distance to get to an area or a clinic where they have the resources they need (Key Informant 2).

Five service provider informants lamented that the county emergency service providers do not know where the farmworkers are located, since the camps are usually “hidden” and “behind the trees” (Key Informant 5). The nonprofit employees were worried that government employees do not even know the farmworkers exist, and that the farmworkers seldom evacuate because “no one knows where to find them” (Key Informant 5). They suspected apathy among
many of the farmworkers’ bosses, who did not seem to follow their mandated emergency plans. Key Informant 4 felt better prepared now, since Sampson County’s Emergency Services and Social Services departments had already taken several trips to locate the farmworkers in this county after Hurricane Matthew.

Language, culture, and fear

Every service provider key informant spoke about a language and cultural barrier between Latinx MSFWs and service providers in these rural counties. This is especially true of mental healthcare providers—rural counties are severely lacking in bilingual and bicultural psychologists, psychiatrists and therapists. Furthermore, county government workers reported it challenging to form meaningful connections with Latinx community members. They believed that many Latinx community members are afraid to interact with law enforcement officials and associate any government logo or uniform as connected to law or immigration enforcement, and therefore untrustworthy.

For instance:

…my concern is that they don’t understand how to reach out and ask for help or they may not be comfortable reaching out and asking for help… whether they’re legal immigrants or not you know, a lot of that comes into play, in my experience when dealing with those communities… One of the other challenges we used to see when I was on the street as a firefighter—was they didn’t mind seeing the fire department, but they really didn’t like to see the law enforcement. And sometimes there was some confusion when all they see is a uniform and they associate every uniform with law enforcement. So, you know, even when we get calls from 911, it was really hard to get a dialogue established, other than ‘this person's hurt, we need your help.’ There was some unwillingness to …have that conversation and get a little deeper (Key Informant 3).

Key Informant 4 also reported:

…during Matthew… when we put up [near a flooded trailer park] a government car with some letters on the side, you know writing on the side, some of these folks don’t
really understand what’s going on, they’re afraid, …they don’t really open up to you, they’ll kind of hide when you put up [there], they’ll hide and not really come outside, [they don’t] understand we’re there to help them. At that point in time we don’t need to see who’s here legally, whatever, we’re here to assist them if they need. And you know getting them to understand that we’re here to help is sometimes a challenge.

The barriers to MSFWs’ resource access of fear, concerns with legal status, and distrust of local government were raised much more frequently by service provider than MSFW key informants. In the counties that have some bilingual staff, Latinx community members have also been reluctant to cooperate with authorities if they distrust the Spanish-speaker based on their origin. For instance, Key Informant 3 used to work with a Honduran firefighter, who the local Latinx community immediately disliked when they heard him speaking Spanish, since they picked up on his dialect and held regional prejudices. This lack of trust is worsened when reports or rumors spread of ICE being present in a county; service providers have seen the number of Latinx people using their health services decline when these rumors spread (Key Informant 2).

MSFW key informants offered mixed sentiments toward different levels of US government. Only one MSFW specifically mentioned President Trump’s rhetoric when expressing pessimism about how the government could improve service access for MSFWs, saying, “…you’ve seen how Donald Trump is, he doesn’t want us…” (MSFW Key Informant). However, another farmworker said he expected Donald Trump or the “president” of NC to send aid to everyone (including farmworkers) after a natural disaster, and that MSFWs would accept it “with open arms” (MSFW Key Informant). This implies that local nonprofit organizations should not feel entirely expected to provide emergency services that replace those of the government.
Economic constraints

Finally, many MSFWs are too economically constrained to devote significant time or money to emergency preparedness, especially when they are constantly sending money back to their families in Mexico. They are also dependent on the weather and health of the crops—if flooding or adverse weather causes a crop to fail, the workers will return to Mexico. They work exhausting jobs, often in intense heat, for six to seven days a week. As Key Informant 2 said,

…in general, what affects patient population more than anything is the workload. If the crop was good this year or not good this year, or frost, if we have an early frost, then people leave so we won’t have as many people in the worker program therefore not as many people seeking health services. I think that would be, from my experience, what drives [service use] a little bit more.

On their Sundays off, many workers want to relax and do their errands; they have little time to enjoy or spend learning new information. Key Informant 1 said,

I guess healthcare in rural areas is already pretty hard to come by, to access, for Americans there. But it’s even twice as worse for farmworkers, because they live in isolated areas and they’re not, they don’t, they only work, sleep and then go get the groceries on the weekends and then repeat every day you know…

As Key Informant 2 said, “I think that’s what we try to help farmworkers realize, that they can be part of communities and get involved in things, but it’s really hard. They work sunup to sundown, six to seven days a week depending on the season, so their social life is really limited.” The farmworkers’ testimonies also reflect this demanding work schedule.

Farmworker natural disaster experiences

The MSFW key informants described a range of experiences with natural disasters in the US. Some brought up man-made disasters as well, including one worker who had recently witnessed fires when multiple gas tanks at his worksite were struck by lightning and exploded.
One MSFW remembered experiencing a hurricane in Miami in 1992. Out of the seven MSFW key informants, four remembered experiencing Hurricane Matthew in NC and one in Virginia.

Of those four who experienced Matthew in NC, two were only mildly impacted by the storm (no loss of electricity or damage to their homes), whereas two others experienced more severe damage (loss of electricity for three to seven days). One farmworker, who was in Mount Olive, NC at the time, said, “We were isolated. There was no electricity, the stores and shops all closed, and it was very hard to find something to eat…some of those who helped us brought us something to eat” (MSFW Key Informant). When I asked if he knew if the rest of the area had evacuated, he responded, “We wouldn’t know, because we were in the field, so we wouldn’t have realized” (MSFW Key Informant), indicating again the level of MSFWs’ isolation and disconnect from the community. He said their boss left the workers in their house during the hurricane but returned immediately after to check on everyone.

Another farmworker described a similar experience in the town of Treyburn, NC. His group had only recently arrived to work at a sweet potato farm there when Matthew hit. They were out of work for 15 days due to flooded fields, unable to leave their homes and traverse flooded roads to get to a store for two weeks. When they finally tried to harvest the sweet potatoes 15 days later, the crop did not suffice, and they earned nothing.

In Carrboro, NC, a farmworker reported being out of work for seven days due to a flooded sweet potato field. Although his trailer home did not flood, he had feared that the trailer would not be able to withstand the hurricane’s winds. Since the highways were flooded, these workers were also left isolated, without external communication for several days.

All five Hurricane Matthew survivors reported that the storm impacted their ability to work, and they had to wait 3 to 22 days for the flooded tobacco or sweet potato fields to drain.
before they could return. They remembered the year as “very sad” and “difficult” (MSFW Key Informants). The MSFWs in Mount Olive could not work for about 22 days, during which they struggled to buy food and to send money to their families in Mexico, while earning no wages. They all reported being impacted economically by these unexpected days of lost work. Given the existing low incomes of MSFWs, this time without work amounted to substantial economic losses for the farmworkers and their families in Mexico.

Many also related these experiences (in Virginia, Miami, and NC) to similar experiences they had had with hurricanes or earthquakes in Mexico. They held mixed opinions on whether it would be more stressful and dangerous to experience a natural disaster in the US or Mexico. Several decided it was more stressful for a natural disaster to happen when you are not with your family. Some believed that it was harder to deal with a natural disaster when you are not in your own country. Others believed that their houses in Mexico were constructed more sturdily, so they would feel safer there than in their “weak little trailers” in NC. Another said that he felt the US was more dangerous than Mexico, given that they have had to work during thunderstorms in the US (MSFW Key Informants).

The MSFWs all seemed willing to use government- and nonprofit-provided resources. When asked about what they should do in an emergency situation, all mentioned calling 911 and said they would feel comfortable doing so. Several had used 911 before (when a coworker was injured/ill during work), and successfully accessed a Spanish-speaking operator. They were unaware of most other publicly-available preparedness, survival or recovery resources. Those who had previously experienced a hurricane in NC knew of churches and other volunteer organizations that would come and provide recovery assistance if needed.
Key informant perspectives on Hurricane Matthew

Service provider key informants also reflected on Hurricane Matthew. They were unprepared for the flooding, since they did not anticipate the storm to be that severe. As one said,

There was water everywhere. It was so much. And the thing with Matthew was—and this was across the state—Matthew was much worse than what it was projected to be. And you know as the event unfolded it was when we were realizing ‘Hey this is going to be worse than what we ever anticipated.’ …the biggest issues we faced is we were not prepared, so we didn't have resources in place pre-staged, because we just didn’t think it was gonna be sixteen inches of water in eight hours. And the thing with water is you can't stop water, …it just has to come and recede. …Once we realized it was gonna be as bad as it was, there was nothing we could do because it just happened so fast, so we couldn’t do anything. So, we were behind the eight ball the entire time. …we're still recovering from Matthew. We still have people who do not have a home yet who are living in hotels, who are living in FEMA trailers, and this is two years later (Key Informant 3).

The key informants at the farmworker nonprofit were particularly distressed recounting their experiences, since they happened to be at a three-day conference in Miami when the storm hit and, for several days, were unable to reach the hundreds of farmworkers who called them for help. Regarding after they got back, they said,

We went to [Johnston County] to see what they needed, and everything was destroyed. For example, the lakes overflowed with water. There were people isolated and others that we saw. In reality, we do participate a lot in the natural disasters that impact the farmworkers. …In Newton Grove where it was flooded, they were living on the roof because the water was so high, and they called us, but we weren’t there, we were in Miami, so we couldn’t do anything for them (Key Informant 5).

To their relief, they were able to call a volunteer from a nearby church that the farmworkers frequent to go help them immediately. Another key informant remarked,

They [the farmworkers] were abandoned by the contractor. Their boss left them there, it was like a trailer park with about three hundred workers. So, they saw the water rising and they went up to the roof of the trailers and tried to get in touch with someone (Key Informant 5).

The Sampson County employee shared a personal perspective on this same incident:

...the recovery process is probably one of the biggest efforts that we have to put in, …that’s probably one of the most complex jobs. Part of the program is reaching out to
those folks, many times. …[After] Matthew for example—we had a trailer park up in north in the county, when the storm came, those folks were hard to find after the storm because they were seasonal workers, …they may have moved to another county, so they were kind of hard to locate, and that’s when we had the outreach with the folks in Newton Grove that could actually help us track them down (Key Informant 4).

Despite challenges in locating these workers, the key informants said they made “great strides” getting public information out and working with surrounding counties to locate Latinx MSFWs. When FEMA and the State opened up a disaster center, “a large number of folks that are Latinos, they’re farmworkers, …went and signed up for assistance” (Key Informant 4). This informant was “pleased with how far [emergency services] have come since…twenty years ago.”

Mental health risk factors

The MSFW key informants identified the following concerns about natural disasters impacting their mental health:

They impact you… mentally because you think about your family, because you stop sending money and stop working. …you get sick from stress. Stress is a tough sickness that if you don’t overcome, you could die of stress. You think things that you shouldn’t… (MSFW Key Informant).¹

The farmworker who had experienced an earthquake in Mexico said of natural disasters, “Of course…you get sick psychologically or in your mind, your heart is affected. …you think everything is trembling when really that’s fear inside your mind and everything. …you’re traumatized. You’re afraid. You have a lot of fear and mentally you’re sick, psychologically” (MSFW Key Informant). This comment is consistent with de la Fuente et al’s findings that a

¹Though this participant (and several others) used the word estrés [stress], it is possible he used this term to describe broader, culturally-bound clinical symptoms of mental illness that originate from intense or chronic stress. Since I am not from his culture, he may also have assumed that I would not have understood these idiomatic descriptions of mental illness. For instance, the terms nervios and ataque de nervios are both defined by the DSM-IV Glossary of Culture-Bound Syndromes as “idioms of distress with overlapping symptoms of anxiety, depression, and disassociation, used throughout Latin America and the Caribbean.” These culture-bound, stress-related syndromes with clear physical implications are further examined in Alcántara et al’s Beyond Anxious Predisposition.²⁸
population of Latinx earthquake survivors in Mexico in 1985 experienced high rates of post-disaster PTSD (32% of study participants), panic disorder, generalized anxiety, and depression. While this MSFW key informant suggested that he experienced similar symptoms, I did not specifically evaluate participants for any of these diagnostic criteria.

When I asked this MSFW if he would ever visit a psychologist to try to fix this “trembling,” he replied, “No, no, you just tell yourself to calm down. You just, time is [what] you need” (MSFW Key Informant). This conversation touched on other potential cultural barriers that prevent Latinxs from accessing mental health services; this topic is not a focus of this paper. Several MSFWs also mentioned that a natural disaster “matures” you, so those who have already experienced a natural disaster react differently the next time. When discussing what they would do if they knew another natural disaster was coming, those with stronger negative memories from Hurricane Matthew expressed a greater desire to prepare better in the future.

Physical health risk factors

The farmworkers expressed concern over various threats to their physical health from natural disasters, though none had been physically injured as a result of a disaster they had experienced. They identified post-disaster health risks, including when “people do not eat or do not sleep well,” and especially when they cannot go out and buy or cook food for themselves (MSFW Key Informants). This is consistent with findings from a study by Messias et al, which identified sleep disturbances and lack of access to food and water as some of the worst immediate health impacts of Hurricane Katrina on Latinx communities. MSFW key informants stated that the mental stress caused by a natural disaster can lead to physical representations of
nerves, such as trembling. Living in “weak trailers” is a risk to their health, since the trailer could easily suffer wind or water damage (MSFW Key Informant).

In sum, one farmworker said, “These problems we have affect people physically, mentally, and everything—they affect everything. That’s why one should analyze the whole problem of natural disasters, because it all affects us—economically, … psychologically, socially…” (MSFW Key Informant). Given the total lived experiences of MSFWs in NC—encompassing annual migration, low incomes, separation from family, potential history of natural disaster experiences, exposure to occupational health risks, and other risk factors—it is evident that MSFWs face various threats to their mental and physical health in emergency contexts.

Farmworker opinions on preparedness

The MSFW key informants reflected on whether they felt prepared for the last natural disaster and how they would prepare differently for the next one. Some had prepared for Hurricane Matthew, purchasing non-perishable foods, but others had not. Those who had experienced another natural disaster before (in the US or Mexico) attributed that experience to their ability to prepare for Matthew. They believed that people who have not experienced a disaster will not take the warnings seriously (although one MSFW asserted that nearly everyone coming from Mexico had experienced at least one hurricane or earthquake there). For instance,

If you had asked me [how I would prepare] before what happened, I would say ‘I don’t care if [the hurricane] comes. If it comes, fine, if not, it doesn’t affect me.’ Why? Because I hadn’t lived through what I now have. But now that I have lived it it’s different. Because I know what happens and I know what can happen—be left without food, without water, without electricity. That’s life… (MSFW Key Informant).
Now that they had experienced a natural disaster, all interviewed MSFWs discussed purchasing canned foods, water, batteries, a radio, and flashlights to prepare for an imminent natural disaster. They would find out where to go and how to get there if they needed to evacuate. They would keep important identification documents in plastic bags. Several said they hoped to never be *fully* prepared, because hopefully they would not have to go through another hurricane. In the following sections, I discuss whether they can feasibly execute all these preparedness goals.

Participants’ suggestions

The MSFW key informants offered the following suggestions to improve emergency preparedness and recovery in their communities. Many expressed a desire for themselves and their communities to be more informed. They suggested the government use text message alerts, television, smart phones, YouTube, Facebook, or radio to inform them of impending natural disasters and how to prepare. They agreed that everyone has a cell phone, and everyone listens to the radio or watches the news, though not everyone has their phone with them or is able to use it during work. One participant mentioned that Facebook is also very popular now. Some were already using their phones to receive emergency alerts (though it was unclear if this was an automated system, and if so where it originated from).

Participants suggested that farmworkers always have their immigration papers ready, since they may need to go back to Mexico if the crops get ruined in a storm. Several MSFWs mentioned the importance of keeping money with them to cover unexpected costs after a disaster; they should also not send too much money back to Mexico if a natural disaster is
coming, since they may need extra money to buy food for themselves if the storm puts them out of work (MSFW Key Informants).

Every MSFW key informant wanted their community members to take emergency warnings seriously and buy the necessary supplies (such as those mentioned under “Farmworker opinions on preparedness”) beforehand. They should be prepared to lose electricity. One MSFW specifically mentioned the importance of maintaining a positive mindset while also taking emergency alerts seriously,

…my idea is that you need to be informed, to be informed through television, and to leave when a hurricane is coming; to be informed through [your] cell phone when there are bad warnings. My idea is to be alert so that you can leave…the suggestion is to not be negative, to always be positive. Because if they [the government] tell you you’re going to evacuate, that a hurricane is going to come, and you say ‘no, no it won’t happen,’ well if they say to you that it’s going to come, better that you say, ‘let’s go wherever they want us to.’ It’s always better to leave with [enough] time, so that you don’t regret it if something happens (MSFW Key Informant).

Another MSFW key informant echoed this sentiment, saying that they should all “take care and not believe [warnings are] a joke,” and “when they advise us [to] prepare ourselves…we have to be prepared. And not say, ‘oh whatever, same if it arrives or if it doesn’t.’ If it comes, be prepared, and if it doesn’t come, well even better—you’re prepared.” He followed up later in the conversation with, “when they alert us, they’re alerting us for something. And thanks to that you know a little, …they [the government] can save your life, and we can save ourselves” (MSFW Key Informant). Comments such as these further suggested that the farmworkers trust public institutions, as well as their personal ability to prepare for disasters. In addition to valuing emergency alerts as valid information, they also seemed trusting of emergency systems’ best intentions in protecting everyone, and of their own capacity to buy necessary supplies and follow instructions in advance, as long as they were given timely warnings.
When I proposed the idea of having a workshop or *plática* [talk] on disaster preparedness (similar to conversations the farmworker service organization was already hosting on topics related to physical and mental health), the farmworkers gave mixed responses. Several said they would not have time and would rather spend their free time relaxing, while others seemed ambivalent. One farmworker expressed a strong interest in such a talk, saying the organization should hold one on a Sunday, since they are coming there for “meetings and other things” already (MSFW Key Informant). Another explained, “Well, here it is very hard…because, it’s only work. And the only day we have to go out a bit is Sunday, so the majority of us prefer to rest. Because during the week, only work, work. And that’s why today, we’re about 23 [people], but today only six came. Last week only three came” (MSFW Key Informant).

Service provider key informants suggested other strategies to improve disaster preparedness and outcomes for the Latinx farmworker community. One service provider mentioned implementing an opt-in reverse 911 alert system in Spanish, which already exists in English in Johnston County (Key Informant 3). Sampson County was further in the development of such a system, and already had a way to transfer LEP callers from their 911 call center to an interpreter if needed (Key Informant 4). Several key informants suggested creating a resource hotline or a centralized resource center (such as 211) in Spanish, so that farmworkers could call in and easily access information from the county, such as where shelters are located. They were also aware of the drawbacks of this approach—“the issue is that in cases of disaster or something the line is hot, as it’s called, so it’s pretty difficult to be able to communicate with them in a moment like that…” (Key Informant 5). They preferred creating several options for farmworkers (and the general Latinx population) to obtain information. The DHHS and nonprofit employees believed health outreach workers could be trained to deliver disaster preparedness
information to the farmworkers, perhaps with a pamphlet with content in Spanish. Key Informant 2 added,

My thinking if that if something does happen the component that’s gonna be really important is the outreach workers that are going out there to these camps and helping these farmworkers out. I think they’re gonna be a big component. Also, because they know where these farmworkers are at, they know where these camps are at and they know how to get there. They’ll be able to direct the services to them. So, I think the outreach workers and the clinics that they work for are gonna be a pretty important component as far as that goes.

Thus, while it is clear that new resources need to be created, many informants seemed encouraged that they could tap into existing resources within the health system. In Johnston County, for example, the health department has already “identified relationships and ways to communicate” with the Latinx community, so the key informant saw “no need to reinvent the wheel if they’ve identified ways to do it,” and suggested following their lead as a start (Key Informant 3).

The nonprofit employees also suggested that they could work with the State or County to ensure that emergency service workers know the location of the farmworker camps. Key Informants 3 and 4 expressed a desire (or said they had already begun) to meet with farmers to discuss how best to communicate with their employees. These informants also believe that churches and schools are good entryways to making connections with the Latinx community, since “just about everyone attends some type of church or organization” (Key Informant 4). The nonprofit workers also suggested using NC Department of Labor data to locate where all the farmworkers live; they emphatically reminded me that the government already has this information and should not be making excuses for not providing it to the Division of Emergency Services. Given these particular key informants’ perspectives—as native Spanish speakers who directly provide services to farmworkers and spend a substantial amount of time with them—
their suggestions should be especially valued in the process of policymaking in this area (in comparison to county employees who may never interact with MSFWs).

These farmworker organization employees also firmly expressed that farmers should update and follow their emergency plans, though this topic was not brought up by any other key informant (this issue may be beyond the dominion of the interviewed government employees, as it falls under the jurisdiction of the Department of Labor, rather than the DHHS or EMD).

Both service provider and MSFW key informants addressed challenges to implementing these policies. The government agencies and nonprofits believed they lacked the capacity to scale up outreach or translation/interpretation services. They would require extra funding (and more availability of new hires in general) to amplify this. Since many MSFWs spend only half the year in the US, their children remain in Mexico. Thus, many have no ties to the local school system. Although distributing information through schools may be effective at reaching the broader Latinx community, including seasonal workers (who remain living in the same place year-round, though their work varies), this strategy will likely not work for migrant/H-2A workers.

Service provider key informants believed the lack of an established relationship between Emergency Services and farmworker communities contributes to and/or stems from a lack of trust, which will take time and a dedicated effort to build. Nonetheless, several service providers cited climate change and the growing population of Latinx residents in the American Southeast as compelling reasons why improving service access for Latinxs should be or already is one of their priorities.
Discussion

Summary of themes

The narratives shared by the MSFW key informants reflect common themes. They live in isolated, fragile worker housing and are dependent upon bosses for transportation. Though they are able to receive news and emergency warnings digitally, over television and radio, and through social networks, they may lack autonomy over their ability to evacuate their homes. Work is a priority in their lives, consuming most of their time. They work as many hours as possible and send as much money as possible home to their families, saving little to cover unanticipated expenditures.

When Hurricane Matthew hit NC in 2016, county emergency services departments were unprepared. In at least two counties, they did not know where MSFWs lived. Some MSFWs were abandoned by their bosses and contractors, several of whom displayed apathy toward their workers’ safety. Hundreds of MSFWs were stranded without food or water, and many of their trailers suffered severe water damage. Informal networks of nonprofit organizations, churches and volunteers assisted the farmworkers who were affected. Several groups of MSFWs only received help after reaching out to a local church or farmworker advocacy organization; government emergency recovery resources were delayed in reaching the MSFWs, if they arrived at all.

Contrary to my expectations, MSFWs reported a willingness to accept public services. They all seemed to trust 911 and local emergency response systems; many were undeterred by a potential language barrier. They understood the importance of preparing for natural disasters but lamented that other members of their community would not take emergency warnings seriously. Only those who had lived through hurricanes or similar experiences in the US would take meaningful actions to prepare. Nonetheless, MSFWs expressed a desire for their community to
improve their preparedness knowledge and capacity, offering suggestions that have been incorporated into my policy recommendations. None of the MSFW key informants described themselves as proficient in English, although most felt like they would be able to access a Spanish-speaking service provider if needed.

The MSFWs also expressed clear concerns for how natural disasters can threaten physical and mental health—such as causing “stress” that “you could die of.” Most farmworkers did not have personal experience with physical health issues as a direct result of a natural disaster, though they mentioned mental health concerns, such as “[thinking] everything is trembling when really it’s fear inside your mind” (MSFW Key Informant). As Perilla et al mention, trauma is experienced differently cross-culturally; the way in which Latinx ethnicity influences trauma experiences and expressions is not well understood.\textsuperscript{21} This is an area in which future research is needed. Regardless, it is clear that mental healthcare is not readily accessible to Latinx MSFWs in rural NC. One service provider key informant mentioned the general lack of bicultural and bilingual mental health providers, though they did not explicitly link this to natural disaster impacts.

Service providers at the nonprofit, county and state levels offered varying opinions and perspectives on Latinx disaster preparedness. Consistently, they identified several key barriers to improving MSFWs’ access to their organizations’ resources: isolation of workers, low English proficiency of workers (language barrier) and insufficient Spanish-speaking government employees, lack of cultural competence among government employees, lack of government employee knowledge of MSFW housing, perceived Latinx fear of US law enforcement (assumed to be viewed as related to ICE), insufficient preparedness knowledge by MSFWs, and apathy of farmworker bosses and/or government agencies.
None of the MSFW key informants expressed this perceived fear of ICE/law enforcement, though none directly spoke about their legal statuses or the concept of deportation. It is possible that these farmworkers, who all have legal status on H-2A visas, feel differently about US law enforcement officials than other Latinx community members who are undocumented. All MSFW participants in this study had family members (most had wives and children) living Mexico and expressed no intention of remaining in the US beyond the work season, so their level of fear of ICE and deportation could be different from other Latinx community members, undocumented or not.

I have chosen to omit personal details about all key informants for the sake of concealing their identities, however it is also important to consider how the service providers’ personal backgrounds may have affected their responses in this study. The state- and nonprofit-level employees reported more personal and professional experience with Latinx communities in NC (some were Latinx immigrants themselves, and/or had previously worked as health outreach workers to farmworkers) than the county-level employees. It is possible that the key informants who were less involved with the Latinx community perceived of fears and trust issues that are not salient with this particular farmworker population. This is consistent with Key Informant One’s belief that community members “lump” all Latinx people (seasonal workers, citizens, lawful permanent residents, undocumented residents, etc.) together.

Government employees seemed aware of their shortcomings in serving MSFW community members, though most were not currently working to overcome any of the aforementioned barriers, improve their relations with Latinx and MSFW communities, or improve disaster preparedness specifically among this population. State- and county-level governments were prioritizing hiring bilingual and bicultural staff before addressing other
shortcomings. Some had begun to improve their knowledge of MSFWs’ housing locations and hoped to work on this more before next hurricane season.

When reflecting on the role that Latinx MSFWs play in their broader communities, nonprofit and government employees all acknowledged the importance of these workers to their local economies. Those at the county level, who had less experience working directly with MSFWs, expressed some lack of knowledge about how many MSFWs are in their county and how much they contribute (though they were confident that these contributions are substantial).

Employees at the state and nonprofit level who work on programs that provide direct services to farmworkers were much more aware of the role of MSFWs in rural NC. They believed that MSFWs live on the margins of these communities; though people know they contribute economically, due to the intense work schedules and geographic isolation of farmworkers, other community members rarely interact meaningfully with them. The uncertain statements of county employees reflected this disconnect. It is likely that the relative invisibility of MSFWs in these broader rural communities prevents government actors from prioritizing their needs in emergency situations. Government actors must make a devoted effort to learning about MSFWs’ needs, figuring out their capacity to meet them, and acting on this knowledge as expediently as possible.

Contribution to the literature

My study expanded upon previous research exploring emergency preparedness among Latinx farmworkers in Eastern NC and among Latinx communities across the US. Beyond understanding how this population understands concepts of preparedness, it explored in depth how a local Latinx community acts upon their conceptions of preparedness, how their ability to
prepare for natural disasters is restricted by structural factors, and the implications of their lack of preparedness, as seen in a recent major hurricane. This paper also added under-studied perspectives to the literature, by exploring natural disaster preparedness in rural Latinx MSFW communities through the lens of service providers who are personally outside of this community.

These findings are consistent with literature on the disparate impact of natural disasters on disadvantaged communities—such as those who are low-income, immigrants, and non-English speaking—in the US, especially those who are disadvantaged at navigating US government systems. Though no MSFW key informants reported injuries or physical health concerns after a hurricane, some reported several days without food access and many discussed mental health impacts. This study intended to build upon the growing body of research about how natural disasters can negatively impact mental and physical health of all types of survivors. Future research should explore the culturally-defined ways in which post-disaster stress manifests itself in this community of Latinx MSFWs (including physical symptoms), and how interventions can most appropriately and effectively mitigate their disaster-related mental health risks.

Due to the small sample size of this study, the data is not generalizable. Since the geographic scope of the participants was limited to several counties, future studies should examine the applicability of my findings to neighboring rural counties, such as Harnett, Wayne, Duplin, and Cumberland. Future studies should also seek larger, more diverse sample sizes, encompassing the diverse landscape of farmworkers throughout NC. These should include: other types of migrant workers and exclusively seasonal, non-migrant workers, and farmworkers in more counties, from a range of national origins, and of varying legal statuses.
Though the research sites in my study loosely correlated with those that have been identified to be at an increasing risk of hurricanes, researchers should more precisely use environmental data to locate and study specific communities that are projected to be the most at-risk given current climate projections. Voices from other types of service providers and stakeholders should be added into this conversation, such as employees at FEMA, the NC EMD, the Red Cross, local sheriffs, farm owners and farmworkers’ bosses.

Cost analyses should be performed to determine the feasibility of implementing the recommended policies, such as a Spanish-language call center or reverse 911 system. Communities with high amounts of MSFWs could benefit from a more comprehensive community asset mapping project, which would help identify community resources that can be engaged to improve Latinx MSFWs’ disaster preparedness. Further research should also confirm that the farmworkers would feel safe having their housing information readily available to the county government. All proposed policy recommendations need to be researched further for feasibility and potential impact.

It is possible that the key informants who spoke to me on the phone reacted to the interview differently than those I met in person. Future studies should be funded to allow for more consistent methods.

Finally, this research focused on Hurricane Matthew as the last major natural disaster to impact rural areas in NC. Since I completed data collection, Hurricane Florence, a Category 4 hurricane, severely impacted many of the areas in which I conducted research. As this recovery effort unfolds, researchers should study how Hurricane Florence impacted MSFWs, and whether any government institutions acted deliberately (or differently from last time) to meet their needs.
Limitations

My ability to conduct this research was constrained by the demanding work schedules of the farmworkers. I visited the MSFWs’ church service on the days described previously by a MSFW key informant, during which three and then six H-2A workers were present (there was some overlap). This was during the peak work season, so many farmworkers opted to rest or took advantage of good weather and spent those days working in the fields instead of attending services. Though the participants seemed very willing to open up to me—many seemed eager to share their stories—it is also possible that my non-Latinx identity limited my ability to recruit and earn the trust of participants. I am a non-native Spanish speaker, so I may have imperfectly communicated with participants. Future studies should be conducted by Latinx, native Spanish-speaking researchers.

Policy Recommendations

Given the above discussion, I have proposed potential policies that should be further researched and implemented through nonprofit organizations or various levels of government.

<table>
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<th>Level of Implementation</th>
<th>Policies</th>
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| Nonprofit organization   | 1. Collaborate with the state government to identify the location of farmworker housing  
2. Assist government agencies with translation of preparedness information and interpretation as needed (as a temporary remedy until they can hire bilingual staff) |
### Local and county government

1. Identify and map all farmworker housing (working with local nonprofit organizations, the NC Department of Labor, and the NC EMD)
2. Work with farmworkers and their employees to identify community needs
3. Create a “reverse 911” alert system in Spanish
4. Create a Spanish-language 211 hotline for information during and after emergencies
5. Conduct outreach and work with farmworker services nonprofit organizations to improve relations between law enforcement and the Latinx community
6. Hire bilingual and bicultural staff across all departments
7. Disseminate disaster preparedness information through local churches and schools

### State government

1. Translate all emergency warnings when 1000 people or at least 5% of an area is LEP (whichever is fewer)\(^2\)
2. Train health outreach workers to distribute disaster preparedness information to MSFWs
3. Require and enforce that farmworker bosses keep updated, accessible emergency plans that account for all workers
   a. Require that plans include transportation in case of a need to evacuate
4. Develop a mechanism to compensate H-2A farmworkers for time lost from work due to severe inclement weather/natural disasters (similar to compensation for farmworkers who lose crops due to weather)

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**Acknowledgements**

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\(^2\) This is in accordance with a presidential Executive Order from 2000, which requires that “federal agencies and all recipients of federal financial assistance provide meaningful access to LEP individuals, in accordance with Title VI of the Civil Rights Act of 1964.” Washington State bill 5046 provides sample language for a bill that could accomplish this.
I owe many thanks to the numerous people who made this research possible. First, thank you to Dr. Gavin Yamey, my devoted advisor, for providing guidance and encouragement from the first day of this process. Thank you, Dr. Adam Hollowell, for your extensive feedback and assistance, and Dr. Ken Rogerson, for never failing to keep my spirits high. Professor Bethzaida Fernandez, Dr. Krista Perreira, Steve Davis, and Juan Carabaña were all instrumental in connecting me with the local farmworker community. This research would not have been possible without their assistance. Dr. Collin Mueller and Noelle Wyman Roth at the Duke Social Science Research Institute provided vital support in developing my methods, interview questions, and coding techniques. Dr. Truls Ostbye and Dr. Jennifer Sperling also served as valuable sounding boards early on in this project, helping steer me in the right direction. Finally, I offer my endless gratitude to every participant who took time out of his or her busy work day to chat with me on the phone or meet in person, and to all the farmworkers who graciously and trustingly opened up to me about challenging memories and intimacies of their lives.
References


17. FEMA Individuals and Households Program (IHP) - Housing Assistance | disasterassistance.gov. Available at: https://www.disasterassistance.gov/get-assistance/forms-of-assistance/4471. (Accessed: 5th December 2018)


Appendix 1: Interview Guide for MSFWs [English version]

1. First, I’d like you to tell me a little about yourself.
   a. Probes: are you married? Do you have children? What is your gender? What do you do for a living? What is your ethnicity? What is your average annual income? Where do you live? Who do you live with? Do you live here all year, or do you migrate for work?

2. Were you in North Carolina during the fall of 2016?
   a. If yes, where did you live and work?
   b. Do you remember any hurricanes around this time [Hurricane Matthew]?
      i. Probe: please walk me through what happened to you during the hurricane.
   c. If no, have you experienced another similar natural disaster since coming to the US (wildfire, flood, hurricane, earthquake, etc.)?
      i. Probe: please tell me about that experience.

3. Tell me about how you first found out that the natural disaster was coming.
   a. Probes: how did you feel when you heard that the natural disaster was coming? Did you feel prepared? What does being “prepared” mean to you?

4. Had you ever experienced a similar natural disaster before this?
   a. Probes: where? What happened? Did this new experience remind you of the old one? Did the old experience impact how you prepared for and acted during the recent natural disaster?

5. How did you prepare for this natural disaster?

6. Please explain your experience during this natural disaster.
   a. Probe: did you receive a warning? Was it in English or Spanish? Could you understand it? Did you know where to go? Why or why not? Did you evacuate? Did you ever feel discriminated against in the evacuation or recovery process?

7. How did the natural disaster affect your job?
   a. Probes: did you miss work during and/or after the natural disaster? Were you able to go back to work? If yes, when? If no, why not? What happened to your income? How did this loss of income impact your life?

8. Do you think the natural disaster affected your health?
a. Probes: how? Were you outside at all during the storm? Were you injured during the storm? How did you deal with any injuries? Was your home affected (flooding, fallen trees, etc.)? Did you lose electricity? If yes, for how long? If you had to leave, were you able to move back into your home? If yes, when? If no, what did you do? Do you notice any new negative health symptoms now, such as allergies, nose/skin/eye irritation, coughing, headache, etc.? Did you experience these symptoms before? Do you remember how you felt right after the storm? Is that different from how you feel now? Did you experience any depression?

9. Explain your experiences seeking help (i.e. government or non-profit provided evacuation assistance, emergency rescue, emergency shelter, financial assistance to recover, etc.) after this disaster.
   a. Probes: what resource(s) and from which source(s) did you receive? How did you find these resources? Did someone (family member, friend, boss/supervisor, etc.) help you? Did you refer anyone else to these resources? How do you feel about applying for government-provided financial assistance? Did you have any interactions with public employees during or after the storm? What happened? How did you feel about these interactions? Were these people helpful? Do you think they wanted to help you? If another hurricane were to happen in the future, would you reach out to these people again?

10. What community resources (i.e. church-based food assistance, English lessons) do you usually use?
   a. Probe: were you aware of these at the time of the hurricane? Is there more this organization could be doing to help you?

11. What would you do now if you found out that another natural disaster [same type] was going to hit?

12. Is there anything else on this topic that you would like to share with me?
Appendix 2: Interview Guide for Service Providers

1. Tell me about yourself – where do you work? How long have you been working here? What is your role/responsibilities in this job?
2. What services do you have that are available to Latinxs? Latinx MSFWs?
3. Do you think Latinxs know about and can access all of your services?
4. What does the county or your organization, etc. do to ensure that Latinxs can access all services?
5. How does access to your services for Latinx MSFWs compare to that of non-migrant Latinxs in your community?
6. How do Latinx MSFWs in your county prepare for natural disasters?
7. How do you think natural disasters impact Latinx MSFWs in your county?
8. What roles do Latinx MSFWs play in your community?
9. Were you here during Hurricane Matthew? Please explain to me that experience for you.
10. Do you personally feel prepared for natural disasters?
11. Should your organization do more to help Latinx MSFWs before and after disasters?
   a. Probes: could you do more? What else could or should be done? Why do you feel this way? Do you have plans to work on this?